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COMPILATION OF MARKUPS

BEFORE THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

FIRST AND SECOND SESSIONS

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Available via the World Wide Web: http://science.house.gov

U.S. GOVERNMENT PUBLISHING OFFICE

35–710PDF WASHINGTON : 2019

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WEDNESDAY, MARCH 1, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:03 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recess at any time, and without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee Rule 2(e) and House Rule 112(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today we meet to consider H.R. 1224, the *NIST Cybersecurity Framework, Assessment, and Auditing Act of 2017*. I recognize myself for an opening statement.

In the last Congress, the Science Committee held a dozen hearings related to oversight and policy aspects of Federal cybersecurity issues. The hearings included the examination of data breaches at the Office of Personnel Management, the Internal Revenue Service and the Federal Deposit Insurance Corporation. These hearings underscored the need for a robust approach to protect U.S. cybersecurity capabilities.

Two weeks ago, the Research and Technology Subcommittee held a hearing on this issue where experts testified on recommendations in two recent reports that involve the National Institute of Standards and Technology (NIST). The bill we consider today, H.R. 1224, the *NIST Cybersecurity Framework, Assessment, and Auditing Act of 2017*, implements key ideas and strengthens Federal Government cybersecurity. I thank Representative Abraham for his initiative on this legislation.

H.R. 1224 ensures that NIST remains a global leader in cybersecurity knowledge, scientific standards-setting, and research and analysis of Federal agencies' cybersecurity readiness. This commonsense legislation takes advantage of NIST's unique capabilities to both develop cybersecurity standards and guidelines, which NIST does now, and go further and evaluate and assess the extent of Federal agencies' compliance with them. Creating more

working groups and guidelines without a determination of whether anyone is using them or using them correctly does not protect our cyber infrastructure. NIST has the experts who develop the standards and guidelines under the Federal Information Security Modernization Act, which apply to the Federal Government.

NIST experts also developed a Cybersecurity Framework, through collaborations between government and private sector that are accepted and used by many private organizations to address and manage their cybersecurity risks in a cost-effective way.

H.R. 1224 directs NIST to promote the Cybersecurity Framework by providing Federal agencies with guidance on how to implement it. Who better to determine if an agency is following these recognized standards than NIST?

We do not make NIST an enforcement agency. The bill does not give the agency authority to exact fines, issue injunctions, or pursue further proceedings beyond assessing, auditing, and reporting. NIST's assessment, audits, and the resulting reports are for Federal agencies only and will not affect the private sector.

We recognize NIST will need resources to accomplish this work, and we will address that in a NIST authorization bill later this year.

The Federal Government collects personally identifiable information about every person in our country. Unfortunately, the Federal Government is the world capital of cyber insecurity.

Two years ago, Chinese hackers broke into OPM's computer systems and stole the personally identifiable information and sensitive background check information on approximately 26 million people, including fingerprint records of 5.6 million individuals. Chinese cyber-criminals also repeatedly hacked and may still be hacking the FDIC computer network. The FDIC hacks threaten everything from large-scale manipulation of our entire financial system to looting individuals' checking, savings, and retirement accounts.

At the IRS, 2016 tax-refund fraud is projected to set a new record at $21 billion. An enterprising crook needs only a name, date of birth and a Social Security number to enter made-up W–2 information, submit a fraudulent return, and receive a refund from the IRS within 30 days. Unless we take new and aggressive steps to prevent rapidly increasing cyber-attacks by foreign criminals and unfriendly governments, our economy and national security are at risk. Not doing this is a vote for the status quo, which will allow continued security breaches to occur.

Representative Abraham's bill serves an important purpose and expands our ability to protect Americans from cybersecurity attacks. I again thank him for his work and I urge my colleagues to support H.R. 1224.

PREPARED STATEMENT OF CHAIRMAN SMITH

Good morning and welcome to today's Full Committee mark up of an important and timely bill.

In the last Congress, the Science Committee held a dozen hearings related to oversight and policy aspects of federal cybersecurity issues.

The hearings included the examination of data breaches at the Office of Personnel Management (OPM), the Internal Revenue Service (IRS) and the Federal Deposit Insurance Corporation (FDIC).

These hearings underscored the need for a robust approach to protect U.S. cybersecurity capabilities.

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Chairman SMITH. That concludes my opening statement, and the gentlewoman from Texas, Eddie Bernice Johnson, the Ranking Member, is recognized for hers.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

I understand and sympathize with the Chairman's desire to move cybersecurity legislation. Cybersecurity is a critically important topic, and one that invites significant press attention.

We had a good hearing before the Research and Technology Subcommittee just 2 weeks ago, during which we heard many good rec-

ommendations from widely respected experts. Some of those recommendations fell within our Committee's jurisdiction, and others did not. I do remember the panel unanimously praising NIST's role in cybersecurity. I also remember discussion about developing metrics for the adoption of NIST's Cybersecurity Framework. Witnesses also discussed requiring Federal agencies to incorporate the Framework into their information security programs.

I can see where Mr. Abraham has attempted to incorporate some aspects of those recommendations into his legislation. However, I specifically recall GAO's recommendation that the Department of Homeland Security, and not NIST, carry out surveys and assessments of the adoption and effectiveness of the Cybersecurity Framework. NIST itself has steadfastly maintained that they are the wrong agency to do it, and not just because of limited resources. I do not remember a single witness or a single expert recommendation suggesting that OSTP should be given any role in evaluation or oversight of cybersecurity in the private sector or the Federal Government. Perhaps if we substituted OMB or DHS for OSTP everywhere in this bill, it might make more sense.

The Majority has inserted an entirely new agency into a policy matter in which they have no expertise and no business being a part of. In doing so, the bill also duplicates authorities and responsibilities clearly assigned to OMB and DHS in current law.

Finally, and speaking to what may be the strangest part of this bill, I do not remember any expert recommending that NIST be given the responsibility to conduct annual cybersecurity audits of other agencies. NIST is not an auditing agency. They have no such history, expertise, or capacity. They are a standards and technology agency.

In addition, a single FISMA audit costs between a few hundred thousand dollars to a couple of million dollars, depending on the size and mission of the agency. Nowhere in this bill do we provide NIST with the tens of millions of dollars of additional funding to become the cybersecurity auditing agency of the Federal Government. This is a massive unfunded mandate levied on an agency which is already over tasked.

Moreover, current law already assigns this very responsibility to agency Inspectors General. And no expert I know of has questioned the quality or integrity of the Interrogatories' work. In fact, IGs know and understand their own agencies' business operations and information systems infrastructure better than NIST ever will. In short, I remain thoroughly baffled by this proposal in the legislation before us today.

Mr. Chairman, I have said this before, and I will say it again here. I stand ready to collaborate and cooperate with you on cybersecurity legislation and oversight. We've been able to do so in the past, including for the *Cybersecurity Enhancement Act of 2014*. However, the bill before us today has a number of controversial new elements which were clearly not vetted with the cybersecurity community or the Administration. I will not support passage today of legislation which will undermine the very agency we are tasking with keeping our cyber infrastructure secure.

I would hope that after this markup, the Majority will take the time to address the concerns that have already been raised in the short time this bill has been publicly available.

I thank you, and yield back.

PREPARED STATEMENT OF MS. JOHNSON

I understand and sympathize with the Chairman's desire to move cybersecurity legislation. Cybersecurity is a critically important topic, and one that invites significant press attention. We had a good hearing before the Research & Technology Subcommittee just two weeks ago, during which we heard many good recommendations from widely respected experts. Some of those recommendations fell within our Committee's jurisdiction, others did not.

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I would hope that after this markup, the Majority will take the time to address the concerns that have already been raised in the short time this bill has been publicly available.

I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

Pursuant to notice, I now call up H.R. 1224, the *NIST Cybersecurity Framework, Assessment, and Auditing Act of 2017*, and the clerk will report the bill.

The CLERK. H.R. 1224, a bill to amend the National Institute of Standards and Technology Act to implement a framework, assessment and audits for improving United States cybersecurity.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

I'll recognize the sponsor of the bill, Mr. Abraham, for an opening statement.

Mr. ABRAHAM. Thank you, Mr. Chairman.

H.R. 1224, the *NIST Cybersecurity Framework, Assessment, and Auditing Act of 2017*, is an extension of my ongoing interest over the state of our Nation's cybersecurity.

Hardly a month goes by without some news of a cyber-attack leading to the successful breach of millions of Americans' financial, health, or other personal data.

During an informative Research and Technology Subcommittee hearing 2 weeks ago, a witness reporting the U.S. Government Accountability Office (GAO) testified, and I quote, "Cyber-based intrusions and attacks on Federal systems and systems supporting our Nation's critical infrastructure, such as communications and financial services, are evolving and becoming more sophisticated." The GAO witness also explained that "over the past several years, GAO has made about 2,500 recommendations to Federal agencies to enhance their information security programs and controls. As of February 2017, about 1,000 recommendations had not been implemented."

These are not pieces of information to be taken lightly. Last fall, this Committee marked up a bill I introduced that reflected a need for accountability, responsibility, and transparency by Federal agencies relative to their cybersecurity capabilities. The bill under discussion today takes the same general approach as last year's bill, which the Committee approved by voice vote. H.R. 1224 also reflects recommendations from two recent reports that were the focus of the Subcommittee hearing 2 weeks ago, and I'll give you some highlights of that bill that include: Amending NIST's mission to emphasize the principle that expanding cyber threats require the engineering of security from the beginning of a system's life cycle; promoting Federal implementation of the NIST Framework for Improving Critical Infrastructure Cybersecurity—that's the Framework portion; establishing a Federal working group to develop quantifiable metrics to help Federal agencies analyze and assess the effectiveness of the Framework in protecting their information and information systems; directing NIST to complete an initial assessment of the cybersecurity preparedness of Federal agencies; directing NIST to initiate individual cybersecurity audits of each agency to assess the extent to which they are meeting the information security standards developed by the Institute; and last, providing agencies and Congress with an audit report.

The Committee's jurisdiction over NIST provides it the ability to present the Institute with the flexibility to expand its functions in an effort to address the cybersecurity emergency facing our Nation. It is to NIST's credit that the Committee regards the Institute as part of the solution, and not the problem.

H.R. 1224 reflects the Committee's resolve to provide Federal agencies all the tools it may be able to use to help remedy the Federal Government's cybersecurity shortcomings.

It's easy to sit back and State, with the benefit of NIST's reputation as an exemplatory agency, that we should not consider chang-

ing the way the Institute operates because of what might happen or how the Institute's reputation or effectiveness might suffer.

But the current state of affairs do not suggest that the best way forward is to keep taking the path of least resistance. Much as the nature of cyber-attacks continue to evolve to reflect the sophistication of the cyber criminals, we in the government must also be willing to evolve to protect Americans and our government. That evolution starts with thinking outside the box instead of maintaining a business-as-usual approach.

H.R. 1224 establishes the Committee's mark on a very important issue. It sets the tone for future cybersecurity discussions by taking some first steps to strengthen Federal cybersecurity defenses, and holding the Federal agencies accountable through regular cyber audits.

I urge my colleagues to support this bill, and I yield back.

PREPARED STATEMENT OF MR. ABRAHAM

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The bill under discussion today takes the same general approach as last year's bill, which the Committee approved by voice vote. H.R. 1224 also reflects recommendations from two recent reports that were the focus of the Subcommittee hearing two weeks ago.

Highlights of the bill include:

- Amending NIST's mission to emphasize the principle that expanding cyber threats require the engineering of security from the beginning of a system's life cycle;
- Promoting federal implementation of the NIST Framework for Improving Critical Infrastructure Cybersecurity (Framework);
- Establishing a federal working group to develop quantifiable metrics to help federal agencies analyze and assess the effectiveness of the Framework in protecting their information and information systems;
- Directing NIST to complete an initial assessment of the cybersecurity preparedness of federal agencies;
- Directing NIST to initiate individual cybersecurity audits of each agency to assess the extent to which they are meeting the information security standards developed by the Institute; and
- Providing agencies and Congress with an audit report.

The Committee's jurisdiction over NIST provides it the ability to present the Institute with the flexibility to expand its functions in an effort to address the cybersecurity emergency facing our nation. It is to NIST's credit that the Committee regards the Institute as part of the solution, and not the problem. H.R. 1224 reflects the Committee's resolve to provide federal agencies all the tools it may be able to use to help remedy the federal government's cybersecurity shortcomings.

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I urge my colleagues to support this bill, and I yield back.

Chairman SMITH. Thank you, Mr. Abraham.

We will now proceed with amendments in the order listed on the roster. The first amendment is going to be the Manger's Amendment, and the clerk will report the amendment.

The CLERK. Amendment to H.R. 1224 offered by Mr. Smith of Texas, amendment #008.

Chairman SMITH. Without objection, the amendment will be considered as read, and I'll recognize myself to explain the Manager's Amendment.

This amendment makes some edits for consistency and clarity. The amendment adds the Office of Management and Budget, OMB, to the Federal Working Group established and chaired by NIST and specifies the involvement of OMB in developing and publishing the annual report based on information compiled by the Federal Working Group.

These commonsense additions will ensure the Federal Working Group has the best representation to effectively guide Federal agencies and that its reports have the weight of the White House behind it.

OMB's role under the Federal Information Security Modernization means the Office is familiar with agency cybersecurity reporting requirements.

These edits further improve an already good bill, and I urge my colleagues to support the amendment.

Is there further discussion on the amendment? The gentlewoman from Texas.

Ms. JOHNSON. Thank you very much, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. I oppose this amendment. As I noted in my opening statement, I oppose the underlying bill. This amendment doesn't do anything to fix the underlying problems with the bill, and in one instance might actually make the bill worse.

I'm happy to see that you're adding OMB to at least somewhere in some of what belongs in the bill. However, your amendment does nothing to fix the inappropriate inclusion of OSTP in the bill while the last paragraph of the amendment will be moot if Mr. Abraham's amendment is accepted. That paragraph has implications beyond this bill, so I want to register my concerns thereto.

The last paragraph contains a blanket prohibition on the use of any information collected under this bill for the purposes of oversight and promulgation of regulations. While I appreciate the desire to engage with industry openly, blanket prohibitions on the use of information seem to me to be shortsighted.

The pitfalls associated with forcing the government to ignore data in a field as vitally important as our national security or cybersecurity seem too numerous to count. The Majority spent much of the last Congress taking the Administration to task for various cybersecurity issues. To now force the government to ignore relevant cybersecurity information seems like a mechanism to ensure the government fails in the future. That seems like a bad idea to me.

I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

Is there any further discussion on the amendment?

If not, the question is on agreeing to the Manager's Amendment.

All those in favor, say aye.

Those opposed, say no.

The ayes have it, and the amendment is agreed to.

The next amendment on the roster is offered by the gentleman from Louisiana, Dr. Abraham, and does the gentleman wish to be recognized?

Mr. ABRAHAM. No, sir, I'm good.

Chairman SMITH. I think you may have an amendment at the desk.

Mr. ABRAHAM. OK.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 1224 offered by Mr. Abraham of Louisiana, amendment #021.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. ABRAHAM. Thank you, Mr. Chairman.

My amendment strikes the public-private working group provision and any reference to it and the accompanying report. The language was developed as a natural extension of a similar provision for a Federal working group established to help Federal agencies determine the effectiveness of the Framework in protecting Federal information systems.

However, since most of the bill focuses on the Committee's concern with making Federal cybersecurity system more secure, I believe this provision aimed at helping private entities would be better addressed in a separate legislative vehicle.

The work of this Committee over the past few years and the testimony from witnesses 2 weeks ago in the Research and Technology Subcommittee hearing reinforce the need for us to focus on Federal agency issues. And you heard Chairman Smith describe the Committee's review of specific agencies, namely the Office of Personnel Management and the IRS and the Federal Deposit Insurance Corporation.

I urge my colleagues to support the amendment, and I yield back.

Chairman SMITH. I appreciate the gentleman's amendment, and I recommend it to my colleagues.

And is there any further discussion on the amendment?

If not, the question is on agreeing to the amendment offered by Mr. Abraham.

All in favor, say aye.

Those opposed, say no.

The ayes have it, and the amendment is agreed to.

The next amendment on the roster is going to be offered by the gentleman from Illinois, Mr. Lipinski, and he is recognized for that purpose.

Mr. LIPINSKI. Mr. Chairman, I have a revised amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 1224 offered by Mr. Lipinski of Illinois, amendment #013.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. LIPINSKI. Thank you.

Cybersecurity is a real and growing challenge for our government, businesses and individuals. While new authorities for information sharing on cyber threats, the increased investments in network security have been put in place, we continue to see vulnerabilities get exploited, our systems or devices hacked, and cyber intrusions occur. These often lead to significant cost or security consequences.

While Federal agencies have been tasked to develop cybersecurity systems based on their individual agency risk assessments, little has been done to assure the effective implementation of cyber protections based on those risk determinations or even that those risks are adequately characterized.

We tend to be reminded of this any time a Federal agency is the target of a major hack. So I agree there's legitimate needs to conduct regular oversight and to audit agency risk assessments in cybersecurity implementation. But I'm not convinced that NIST or at least NIST alone is the appropriate agency for this task for a few reasons.

First, while the Institute is capable of supporting the development of a cyber framework and standards, conducting audits would be a different task. It would require a larger work force with new skill sets and expertise in computer security, audit methodologies, and more. Other agencies such as the GAO are more experienced in conducting audits while Inspectors General are going to have greater understanding of other respective agencies' business models, computer networks and services that would allow for more comprehensive audit.

There are also concerns that having NIST develop cybersecurity framework for private-sector entities could be perceived as oversight or regulatory approach which could turn private parties away from working with the Institute and other technical standards and activities.

I believe that this concern has been addressed in part at least through Mr. Abraham's amendment.

Finally, over the last few years, an array of new cyber authorities, information-sharing regimes and technical capabilities have been stood up by legislation and executive action, which appear to not be integrated into the bill we have before us.

We passed the *Cybersecurity Information Sharing Act* 14 months ago to enable threat-based cybersecurity information to be shared

between private entities and the U.S. Government. DHS has continued to develop its EINSTEIN system to detect and block cyber intrusions at Federal agencies and to use that threat information to better protect the rest of the government. DHS is also tasked with working alongside the private sector to protect private and public critical infrastructure including cyber-based systems. It is also joint lead agencies with NIST in developing a better qualified cyber work force.

I think we should be cautious in adding to NIST this new cyber—these new cyber responsibilities without considering how we integrate them with other existing cybersecurity programs across our government.

What my amendment would do is before conducting the audits, direct the Institute to first develop a plan for how it would carry out the very broad and intensive work of cyber auditing of every Federal department. We should know how much manpower this will take, what it will cost, where and if such expertise exists in the Federal Government at NIST or elsewhere, or if there will be a need to contract out this type of work. We also need to know what type of methods or approach NIST and/or other agencies would use in conducting cyber audits. Once the Institute has developed that plan and sent it to Congress, we'll know the cost and requirements to fulfill this task and support NIST effectively in carrying out its mission.

My amendment had originally sought to delay the onset of the audits so that it would follow the plan, but I understand the Chairman's interest in the audits commencing as soon as possible. I hope we can continue to work to perfect this as the bill moves ahead.

We do not want to ask NIST or any other agency to take on the vital task of assuring our Federal agencies have prepared their networks to be safe but then provide it with the manpower, funding, expertise or knowledge to do the job right the first time. We have seen far too many times computer network security get shorted in attention and resources and then we complain about the outcomes. We should not do that now, and this amendment will help to hopefully ensure that we do not do that here.

So I ask for support of this amendment, and I yield back.

Chairman SMITH. Thank you, Mr. Lipinski. I appreciate the thoughtful amendment, and I recommend it to my colleagues, and yes, we will continue our discussions on the general subject.

Is there any further discussion on the amendment?

If not, the question is on agreeing to the amendment offered by Mr. Lipinski.

All in favor, say aye.

Those opposed, say no.

The ayes have it, and the amendment is agreed to.

The next amendment on the roster will be offered by the gentleman from Illinois, Dr. Foster, and he is recognized for that purpose.

Mr. FOSTER. Thank you, Mr. Chairman. This amendment is from myself and Mr. Takano, and it simply asks——

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 1224 offered by Mr. Foster of Illinois, amendment #010.

Chairman SMITH. And without objection, the amendment will be considered as read. I'm going to reserve a point of order against the amendment for being non-germane but nevertheless the gentleman is recognized to explain the amendment.

Mr. FOSTER. Thank you, Mr. Chairman.

This amendment is from myself and Mr. Takano, and it simply adds a sense of Congress that the Office of Technology Assessment, or OTA, should be reinstated. For more than two decades, the OTA provided relevant, unbiased and technical and scientific assessments for Members of Congress and their staff, and although the OTA remains authorized to this day, foolishly, the Office was defunded in 1995, stripping Congress of a valuable resource that understood emerging technologies as well as the intricacies of the legislative process and the needs of policymakers.

The expertise provided by the OTA saved taxpayers billions of dollars by identifying cost-effective areas for future investment and avoiding wasting money on technologies and policies that did not and could not work. The OTA's 24-year body of work encompasses some 750 reports and assessments on issues as far-ranging as arms control to bioterrorism to computer network and security and privacy issues. Interestingly, the last report the OTA issued was on network security and privacy issues and was published in 1995, just before it was defunded. Imagine how useful such a report would have been if it could have been paid attention to and updated through today.

As technology continues to advance and non-defense budgets continue to shrink, this sort of trustworthy, nonpartisan analysis is no less necessary today than it was when the OTA was first started over 40 years ago.

We cannot slow down the rapid pace of technology but we can give ourselves back an important and proven tool. Congress needs the OTA now more than ever, and what we should be talking about is this rather than other things we're discussing today. And if we really want to get ahead of the next cybersecurity threats, we should be doing everything we can to make informed policy decisions. Instead of straining the authority and the resources of NIST just so this Committee can claim that we did something relevant about cybersecurity, we should be making smart policy with input from nonpartisan experts. This is exactly what the Office of Technology Assessment used to do, and I'm very grateful to my colleague on the Committee, Mr. Takano, for his efforts in this area and for cosponsoring this amendment as well as to my colleague, Mr. Chaffetz of Utah, who has worked with me for several years advocating for the OTA.

And I'd now like to yield 1 minute to my cosponsor, Mr. Takano.

Mr. TAKANO. Thank you, Mr. Foster.

I have been proud to work with you in raising awareness and support for the Office of Technology Assessment, or OTA.

As you say, for more than two decades OTA provided unbiased technical and scientific assessments for Members of Congress and staff. The OTA was defunded in 1995, stripping Congress of a valuable resource. Twenty years later, many of the topics OTA studied are still relevant today. I certainly believe that we would be better

able to tackle the complexity of an issue like cybersecurity if we had OTA today.

This amendment expresses the sense of Congress that OTA should be funded. In a world of alternative facts, the unbiased and thorough analysis of OTA provided—that the OTA provided is more important than ever.

I yield back to Mr. Foster.

Mr. FOSTER. Thank you, Mr. Takano.

Mr. Chairman, I understand that we are unlikely to have the votes to prevail against your technical point of order against this amendment and so I hereby withdraw my amendment, but I do urge my colleagues to think critically about the time and money that we could have saved rather than legislating for an uncertain and poorly understood future of technology, and urge my colleagues to work every way we can to try to restore funding for the OTA.

Thank you, and I yield back.

Chairman SMITH. Mr. Foster, Mr. Takano, thank you for your comments. As tempted as I am to support an amendment that would allow the President to appoint more individuals, I nevertheless appreciate the gentleman withdrawing the amendment. Without objection, it is withdrawn.

Are there any further amendments?

If not, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 1224 to the House as amended with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 1224 to the House as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably——

Ms. JOHNSON. Mr. Chairman.

Chairman SMITH. The gentlewoman from Texas.

Ms. JOHNSON. I'd like to request a record vote on this.

Chairman SMITH. A roll call vote has been requested. Without objection, the clerk will call the roll.

The CLERK. Mr. Smith?

Chairman SMITH. Aye.

The CLERK. Mr. Smith votes aye.

Mr. Lucas?

Mr. LUCAS. Aye.

The CLERK. Mr. Lucas votes aye.

Mr. Rohrabacher?

Mr. ROHRABACHER. Aye.

The CLERK. Mr. Rohrabacher votes aye.

Mr. Brooks?

Mr. BROOKS. Aye.

The CLERK. Mr. Brooks votes aye.

Mr. Hultgren?

Mr. HULTGREN. Aye.

The CLERK. Mr. Hultgren votes aye.

Mr. Posey?

Mr. POSEY. Aye.

The CLERK. Mr. Posey votes aye.

Mr. Massey?
Mr. MASSEY. Aye.
The CLERK. Mr. Massey votes aye.
Mr. Bridenstine?
[No response.]
The CLERK. Mr. Weber?
Mr. WEBER. Aye.
The CLERK. Mr. Weber votes aye.
Mr. Knight?
Mr. KNIGHT. Aye.
The CLERK. Mr. Knight votes aye.
Mr. Babin?
[No response.]
The CLERK. Mrs. Comstock?
Mrs. COMSTOCK. Aye.
The CLERK. Mrs. Comstock votes aye.
Mr. Palmer?
[No response.]
The CLERK. Mr. Loudermilk?
[No response.]
The CLERK. Mr. Abraham?
Mr. ABRAHAM. Aye.
The CLERK. Mr. Abraham votes aye.
Mr. LaHood?
Mr. LAHOOD. Aye.
The CLERK. Mr. LaHood votes aye.
Mr. Webster?
[No response.]
The CLERK. Mr. Banks?
Mr. BANKS. Aye.
The CLERK. Mr. Banks votes aye.
Mr. Biggs?
[No response.]
The CLERK. Mr. Marshall?
Mr. MARSHALL. Aye.
The CLERK. Mr. Marshall votes aye.
Mr. Dunn?
Mr. DUNN. Aye.
The CLERK. Mr. Dunn votes aye.
Mr. Higgins?
Mr. HIGGINS. Aye.
The CLERK. Mr. Higgins votes aye.
Ms. Johnson?
Ms. JOHNSON. No.
The CLERK. Ms. Johnson votes no.
Ms. Lofgren?
[No response.]
The CLERK. Mr. Lipinski?
Mr. LIPINSKI. Aye.
The CLERK. Mr. Lipinski votes aye.
Ms. Bonamici?
Ms. BONAMICI. No.
The CLERK. Ms. Bonamici votes no.
Mr. Bera?

Mr. BERA. No.
The CLERK. Mr. Bera votes no.
Ms. Esty?
Ms. ESTY. No.
The CLERK. Ms. Esty votes no.
Mr. Veasey?
Mr. VEASEY. No.
The CLERK. Mr. Veasey votes no.
Mr. Beyer?
Mr. BEYER. No.
The CLERK. Mr. Beyer votes no.
Ms. Rosen?
Ms. ROSEN. No.
The CLERK. Ms. Rosen votes no.
Mr. McNerney?
Mr. MCNERNEY. No.
The CLERK. Mr. McNerney votes no.
Mr. Perlmutter?
Mr. PERLMUTTER. No.
The CLERK. Mr. Perlmutter votes no.
Mr. Tonko?
Mr. TONKO. No.
The CLERK. Mr. Tonko votes no.
Mr. Foster?
Mr. FOSTER. No.
The CLERK. Mr. Foster votes no.
Mr. Takano?
Mr. TAKANO. No.
The CLERK. Mr. Takano votes no.
Ms. Hanabusa?
Ms. HANABUSA. No.
The CLERK. Ms. Hanabusa votes no.
Mr. Crist?
Mr. CRIST. No.
The CLERK. Mr. Crist votes no.
Mr. Babin?
Mr. BABIN. Aye.
The CLERK. Mr. Babin votes aye.
Mr. Loudermilk?
Mr. LOUDERMILK. Aye.
The CLERK. Mr. Loudermilk votes aye.
Mr. CHAIRMAN.
Chairman SMITH. The clerk will report the vote.
The CLERK. Mr. Chairman, 19 Members voted aye and 14 Members voted no.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: 3/1/17

Bill: H.R. 1224 Final Passage

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* - *TX*	X			
2 Mr. LUCAS – *OK* **	X			
3 Mr. ROHRABACHER – *CA*	X			
4 Mr. BROOKS – *AL*	X			
5 Mr. HULTGREN – *IL*	X			
6 Mr. POSEY – *FL*	X			
7 Mr. MASSIE – *KY*	X			
8 Mr. BRIDENSTINE – *OK*				
9 Mr. WEBER – *TX*	X			
10 Mr. KNIGHT – *CA*	X			
11 Mr. BABIN – *TX*	X			
12 Mrs. COMSTOCK – *VA*	X			
13 Mr. PALMER – *AL*				
14 Mr. LOUDERMILK – *GA*	X			
15 Mr. ABRAHAM – *LA*	X			
16 Mr. LAHOOD – *IL*	X			
17 Mr. WEBSTER – *FL*				
18 Mr. BANKS – *IN*	X			
19 Mr. BIGGS – *AZ*				
20 Mr. MARSHALL – *KS*	X			
21 Mr. DUNN – *FL*	X			
22 Mr. HIGGINS – *LA*	X			
1 Ms. JOHNSON, *Ranking* - *TX*		X		
2 Ms. LOFGREN –*CA*				
3 Mr. LIPINSKI – *IL*	X			
4 Ms. BONAMICI – *OR*		X		
5 Mr. BERA – *CA*		X		
6 Ms. ESTY – *CT*		X		
7 Mr. VEASEY – *TX*		X		
8 Mr. BEYER – *VA*		X		
9 Ms. ROSEN – *NV*		X		
10 Mr. MCNERNEY – *CA*		X		
11 Mr. PERLMUTTER – *CO*		X		
12 Mr. TONKO – *NY*		X		
13 Mr. FOSTER – *IL*		X		
14 Mr. TAKANO – *CA*		X		
15 Ms. HANABUSA – *HI*		X		
16 Mr. CRIST – *FL*		X		
17 VACANT				
TOTALS				

** Vice Chair

Chairman SMITH. The ayes have it, and H.R. 1224 is reported favorably to the House as amended.

Without objection, the Motion to Reconsider is laid upon the table. H.R. 1224 is ordered reported to the House.

I ask unanimous consent that staff authorized to make any necessary technical and conforming changes. Without objection, so ordered.

If there is no further discussion, that completes our business, and this concludes the Science Committee markup. Without objection, the Committee stands adjourned.

[Whereupon, at 10:37 a.m., the Committee was adjourned.]

Appendix:

H.R. 1224, Amendment Roster, Section-by-Section Analysis, Letter of Support

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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To amend the National Institute of Standards and Technology Act to implement a framework, assessment, and audits for improving United States cybersecurity.

IN THE HOUSE OF REPRESENTATIVES

Mr. ABRAHAM introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the National Institute of Standards and Technology Act to implement a framework, assessment, and audits for improving United States cybersecurity.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "NIST Cybersecurity
5 Framework, Assessment, and Auditing Act of 2017".

1 **SEC. 2. NIST MISSION TO ADDRESS CYBERSECURITY**
2 **THREATS.**

3 Section 20(a)(1) of the National Institute of Stand-
4 ards and Technology Act (15 U.S.C. 278g–3(a)(1)) is
5 amended by inserting ", emphasizing the principle that ex-
6 panding cybersecurity threats require engineering security
7 from the beginning of an information system's life cycle,
8 building more trustworthy and secure components and
9 systems from the start, and applying well-defined security
10 design principles throughout" before the semicolon.

11 **SEC. 3. IMPLEMENTATION OF CYBERSECURITY FRAME-**
12 **WORK.**

13 The National Institute of Standards and Technology
14 Act (15 U.S.C. 271 et seq.) is amended by inserting after
15 section 20 the following:

16 **"SEC. 20A. FRAMEWORK FOR IMPROVING CRITICAL INFRA-**
17 **STRUCTURE CYBERSECURITY.**

18 "(a) IMPLEMENTATION BY FEDERAL AGENCIES.—

19 "(1) IN GENERAL.—The Institute shall promote
20 the implementation by Federal agencies of the
21 Framework for Improving Critical Infrastructure
22 Cybersecurity (in this section and section 20B re-
23 ferred to as the 'Framework') by providing to the
24 Office of Management and Budget, the Office of
25 Science and Technology Policy, and all other Federal
26 agencies, not later than 6 months after the date of

1 enactment of the NIST Cybersecurity Framework,
2 Assessment, and Auditing Act of 2017, guidance
3 that Federal agencies may use to incorporate the
4 Framework into their information security risk man-
5 agement efforts, including practices related to com-
6 pliance with chapter 35 of title 44, United States
7 Code, and any other applicable Federal law.
8 "(2) GUIDANCE.—The guidance required under
9 paragraph (1) shall—
10 "(A) describe how the Framework aligns
11 with or augments existing agency practices re-
12 lated to compliance with chapter 35 of title 44,
13 United States Code, and any other applicable
14 Federal law;
15 "(B) identify any areas of conflict or over-
16 lap between the Framework and existing
17 cybersecurity requirements, including gap areas
18 where additional policies, standards, guidelines,
19 or programs may be needed to encourage Fed-
20 eral agencies to use the Framework and im-
21 prove the ability of Federal agencies to manage
22 cybersecurity risk;
23 "(C) include a template for Federal agen-
24 cies on how to use the Framework, and rec-
25 ommend procedures for streamlining and har-

1 monizing existing and future cybersecurity-re-
2 lated requirements, in support of the goal of
3 using the Framework to supplant Federal agen-
4 cy practices in compliance with chapter 35 of
5 title 44, United States Code;
6 "(D) recommend other procedures for com-
7 pliance with cybersecurity reporting, oversight,
8 and policy review and creation requirements
9 under such chapter 35 and any other applicable
10 Federal law; and
11 "(E) be updated, as the Institute considers
12 necessary, to reflect what the Institute learns
13 from ongoing research, the audits conducted
14 pursuant to section 20B(b), the information
15 compiled by the Federal working group estab-
16 lished pursuant to paragraph (3), the informa-
17 tion compiled by the public-private working
18 group established pursuant to subsection (b)(1),
19 the annual reports published pursuant to para-
20 graph (4), and the annual reports published
21 pursuant to subsection (b)(2).
22 "(3) FEDERAL WORKING GROUP.—Not later
23 than 3 months after the date of enactment of the
24 NIST Cybersecurity Framework, Assessment, and
25 Auditing Act of 2017, the Institute shall establish

1 and chair a working group (in this section referred
2 to as the 'Federal working group'), including rep-
3 resentatives of the Office of Science and Technology
4 Policy and other appropriate Federal agencies, which
5 shall—
6 "(A) not later than 6 months after the
7 date of enactment of the NIST Cybersecurity
8 Framework, Assessment, and Auditing Act of
9 2017, develop outcome-based and quantifiable
10 metrics, in coordination with the public-private
11 working group established pursuant to sub-
12 section (b), to help Federal agencies in their
13 analysis and assessment of the effectiveness of
14 the Framework in protecting their information
15 and information systems;
16 "(B) update such metrics as the Federal
17 working group considers necessary;
18 "(C) compile information from Federal
19 agencies on their use of the Framework and the
20 results of the analysis and assessment described
21 in subparagraph (A); and
22 "(D) assist the Office of Science and Tech-
23 nology Policy in publishing the annual report
24 required under paragraph (4).

1 "(4) REPORT.—The Office of Science and
2 Technology Policy shall develop and make publicly
3 available an annual report on agency adoption rates
4 and the effectiveness of the Framework. In pre-
5 paring such report, the Office shall use the informa-
6 tion compiled by the Federal working group pursu-
7 ant to paragraph (3)(C).
8 "(b) IMPLEMENTATION BY PRIVATE ENTITIES.—
9 "(1) PUBLIC-PRIVATE WORKING GROUP.—Not
10 later than 6 months after the date of enactment of
11 the NIST Cybersecurity Framework, Assessment,
12 and Auditing Act of 2017, the Institute shall, in co-
13 ordination with industry stakeholders, establish a
14 working group (in this section referred to as the
15 'public-private working group') which shall—
16 "(A) not later than 1 year after the date
17 of enactment of the NIST Cybersecurity
18 Framework, Assessment, and Auditing Act of
19 2017, develop specific Framework implementa-
20 tion models and measurement tools that private
21 entities can use to adopt the Framework;
22 "(B) not later than 1 year after the date
23 of enactment of the NIST Cybersecurity
24 Framework, Assessment, and Auditing Act of
25 2017, develop, in coordination with the Federal

1 working group, industry-led, consensus and out-
2 come-based metrics that quantify the effective-
3 ness and benefits of the Framework to enable
4 private entities to voluntarily analyze and as-
5 sess their individual corporate cybersecurity
6 risks;
7 "(C) update the models and tools devel-
8 oped pursuant to subparagraph (A) and the
9 metrics developed pursuant to subparagraph
10 (B), as the public-private working group con-
11 siders necessary;
12 "(D) compile information, derived from the
13 metrics developed pursuant to subparagraph
14 (B), voluntarily submitted by private entities on
15 their use of the Framework and on the effec-
16 tiveness and benefits of such use;
17 "(E) analyze the information compiled
18 pursuant to subparagraph (D) and provide such
19 information and analysis to—
20 "(i) the Institute, for the purpose of
21 enabling the Institute to make improve-
22 ments to the Framework; and
23 "(ii) private entities, for the purpose
24 of providing such entities with a greater
25 understanding of the benefits of the

1 Framework to enable them to use the
2 Framework more effectively to improve
3 their cybersecurity; and
4 "(F) assist the Office of Science and Tech-
5 nology Policy in publishing the annual report
6 required under paragraph (2).
7 "(2) REPORT.—The Office of Science and
8 Technology Policy shall develop and make publicly
9 available an annual report on industry adoption
10 rates and the effectiveness of the Framework. In
11 preparing such report, the Office shall use informa-
12 tion compiled by the public-private working group
13 pursuant to paragraph (1)(D).
14 **"SEC. 20B. CYBERSECURITY AUDITS.**
15 "(a) INITIAL ASSESSMENT.—
16 "(1) REQUIREMENT.—Not later than 6 months
17 after the date of enactment of the NIST
18 Cybersecurity Framework, Assessment, and Auditing
19 Act of 2017, the Institute shall complete an initial
20 assessment of the cybersecurity preparedness of the
21 agencies described in paragraph (2). Such assess-
22 ment shall be based on information security stand-
23 ards developed under section 20, and may also be in-
24 formed by work done or reports published by other
25 Federal agencies or officials.

1 "(2) AGENCIES.—The agencies referred to in
2 paragraph (1) are the agencies referred to in section
3 901(b) of title 31, United States Code, and any
4 other agency that has reported a major incident (as
5 defined in the Office of Management and Budget
6 Memorandum—16—03, published on October 30,
7 2015, or any successor document).
8 "(3) NATIONAL SECURITY SYSTEMS.—The re-
9 quirement under paragraph (1) shall not apply to
10 national security systems (as defined in section
11 3552(b) of title 44, United States Code).
12 "(b) AUDITS.—
13 "(1) REQUIREMENT.—Not later than 6 months
14 after the date of enactment of the NIST
15 Cybersecurity Framework, Assessment, and Auditing
16 Act of 2017, the Institute shall initiate an individual
17 cybersecurity audit of each agency described in sub-
18 section (a)(2), to assess the extent to which the
19 agency is meeting the information security standards
20 developed under section 20.
21 "(2) RELATION TO FRAMEWORK.—Audits con-
22 ducted under this subsection shall—
23 "(A) to the extent applicable and available,
24 be informed by the report on agency adoption

1 rates and the effectiveness of the Framework
2 described in section 20A(a)(4); and
3 "(B) if the agency is required by law or ex-
4 ecutive order to adopt the Framework, be based
5 on the guidance described in section 20A(a)(2)
6 and metrics developed under section
7 20A(a)(3)(A).
8 "(3) SCHEDULE.—The Institute shall establish
9 a schedule for completion of audits under this sub-
10 section to ensure that—
11 "(A) audits of agencies whose information
12 security risk is high, based on the assessment
13 conducted under subsection (a), are completed
14 not later than 1 year after the date of enact-
15 ment of the NIST Cybersecurity Framework,
16 Assessment, and Auditing Act of 2017, and are
17 audited annually thereafter; and
18 "(B) audits of all other agencies described
19 in subsection (a)(2) are completed not later
20 than 2 years after the date of enactment of the
21 NIST Cybersecurity Framework, Assessment,
22 and Auditing Act of 2017, and are audited bi-
23 ennially thereafter.

1 "(4) REPORT.—A report of each audit con-
2 ducted under this subsection shall be transmitted by
3 the Institute to—
4 "(A) the Office of Management and Budg-
5 et;
6 "(B) the Office of Science and Technology
7 Policy;
8 "(C) the Government Accountability Of-
9 fice;
10 "(D) the agency being audited;
11 "(E) the Inspector General of such agency,
12 if there is one; and
13 "(F) Congress, including the Committee on
14 Science, Space, and Technology of the House of
15 Representatives and the Committee on Com-
16 merce, Science, and Transportation of the Sen-
17 ate.".

AMENDMENT TO H.R. ____

OFFERED BY MR. SMITH OF TEXAS

Page 5, lines 3-4, strike "Office of Science and Technology Policy" and insert "Office of Management and Budget, the Office of Science and Technology Policy,".

Page 5, line 22, insert "the Office of Management and Budget and" before "the Office".

Page 6, line 1, insert "the Office of Management and Budget and" before "the Office".

Page 6, line 13, insert "and chair" after "establish".

Page 6, lines 20-21, strike "that private entities can use to adopt" and insert "for private entity use of".

Page 8, line 9, strike "adoption" and insert "utilization".

Page 8, line 13, insert "None of this information shall be used for purposes of oversight or promulgation of regulations by any Federal regulatory agency." after "paragraph (1)(D).".

AMENDMENT TO H.R. ____

OFFERED BY MR. ABRAHAM OF LOUISIANA

Page 4, lines 16-18, strike "the information compiled by the public-private working group established pursuant to subsection (b)(1)," and insert "and".

Page 4, lines 20-21, strike ", and the annual reports published pursuant to subsection (b)(2)".

Page 5, lines 10-12, strike ", in coordination with the public-private working group established pursuant to subsection (b),".

Page 6, line 8, through page 8, line 13, strike subsection (b) and redesignate the preceding provisions accordingly.

AMENDMENT TO H.R. _____

OFFERED BY MR. LIPINSKI OF ILLINOIS

Page 9, after line 11, insert the following:

1 (b) AUDIT PLAN.—Not later than 6 months after the
2 date of enactment of this Act, the Institute shall prepare
3 a needs-based plan for carrying out the audits of agencies
4 as required under subsection (c). Such plan shall include
5 a description of staffing plans, workforce capabilities,
6 methods for conducting such audits, coordination with
7 agencies to support such audits, expected timeframes for
8 the completion of audits, and other information the Insti-
9 tute considers relevant. The plan shall be transmitted by
10 the Institute to the congressional entities described in sub-
11 section (c)(4)(F).

Page 9, line 12, strike "(b)" and insert "(c)".

AMENDMENT TO H.R. ____

OFFERED BY MR. FOSTER OF ILLINOIS

Page 11, after line 17, add at the end the following:

1 **SEC. 4. OFFICE OF TECHNOLOGY ASSESSMENT.**

2 It is the sense of Congress that—

3 (1) the legislative process would greatly benefit
4 from once again having an office dedicated to giving
5 nonpartisan, technical advice to Congress;

6 (2) the Office of Technology Assessment rep-
7 resents a cost-effective improvement to the govern-
8 ance of our country; and

9 (3) funding should be restored to the Office of
10 Technology Assessment.

SECTION-BY-SECTION ANALYSIS OF H.R. 1224, NIST CYBERSECURITY FRAMEWORK, ASSESSMENT, AND AUDITING ACT OF 2017

House Committee on Science, Space, and Technology

SECTION BY SECTION

H.R. 1224, the NIST Cybersecurity Framework, Assessment, and Auditing Act of 2017

Introduced by Rep. Ralph Abraham
Cosponsored by Chairman Smith, Vice-Chairman Lucas, Chairwoman Comstock and Rep. Knight

Sec. 1. Short Title
This section establishes the short title of the bill as the "NIST Cybersecurity Framework, Assessment, and Auditing Act of 2017."

Sec. 2. NIST Mission to Address Cybersecurity Threats.
This section amends NIST's mission under the Computer Standards Program (15 USC 278g-3(a)(1)). It directs the Institute to emphasize the principle that expanding cybersecurity threats require the engineering of security from the beginning of an information system's life cycle through building more trustworthy and secure components, and by applying well-defined security design principles throughout the system's life span.

Sec. 3. Implementation of Cybersecurity Framework.
This section creates two new sections in the NIST statute:

Sec. 20A – Framework for Improving Critical Infrastructure Cybersecurity (Framework):

MISSION AND GUIDANCE -- Promotes the implementation of the Framework by providing guidance that Federal agencies may use to incorporate the Framework into their information security risk management efforts, including compliance with the Federal Information Security Modernization Act (44 USC 35), and any other applicable Federal law. The guidance shall be provided to the Office of Management and Budget (OMB), the Office of Science and Technology Policy (OSTP), and all other Federal agencies within 6 months of the bill's enactment, and then updated as necessary.

FEDERAL WORKING GROUP -- Creates a Federal working group, established and chaired by NIST, to develop outcome-based and quantifiable metrics, updated as necessary, to help Federal agencies analyze and assess the effectiveness of the Framework in protecting their information and information systems. The Federal working group will develop these metrics in coordination with the public-private working group described below. The Federal working group shall be established within 3 months of the bill's enactment, and the metrics not later than 6 months after the bill's enactment. The Federal working group shall also compile information from Federal agencies on their use of the Framework and results of their analysis and assessment, which shall be published in an annual report by OMB and OSTP.

PUBLIC-PRIVATE WORKING GROUP -- Creates a public-private working group, established by NIST, in coordination with industry stakeholders, to develop specific Framework implementation models and measurement tools, updated as necessary, that private entities can use to adopt the Framework. The public-private working group shall also develop industry-led consensus and outcome-based metrics, updated as necessary, that quantify the effectiveness and benefits of the Framework to enable private entities to

voluntarily analyze and assess their individual corporate cybersecurity risks. The public-private working group will develop these metrics in coordination with the Federal working group described above. The public-private working group shall be established within six months of the bill's enactment, and the models and measurement tools, as well as the metrics, shall be developed not later than one year after the bill's enactment. The public-private working group shall compile information voluntarily submitted by private entities on their use of the Framework and on the effectiveness and benefits of such use. This information will help NIST make improvements to the Framework and assist private entities to better understand the benefits of the Framework so they use it more effectively. The compiled information shall be published in an annual report by OSTP.

SEC. 20B. Cybersecurity Audits:

ASSESSMENT -- Directs NIST to complete an initial assessment of the cybersecurity preparedness of the 24 CFO-Act Federal agencies, and any other Federal agencies that have reported a major cybersecurity incident, based on the information security standards developed by NIST, not later than 6 months after the bill's enactment into law. This assessment may also be informed by work done or reports published by other Federal agencies or officials.

AUDITS -- Not later than six months after the bill's enactment into law, directs the Institute to initiate individual cybersecurity audits of each agency covered under the initial group assessment to determine the extent to which each agency is meeting the information security standards developed by the Institute.

SCHEDULE -- Directs NIST to establish a schedule for these audits based on the initial assessment. Agencies whose information security risk is high, shall have audits completed not later than one year after the bill's enactment into law, and then annually thereafter. Agencies that do not fall into this category shall have the initial audit completed no later than two years after the bill's enactment, and then biennially thereafter.

RELATION TO FRAMEWORK -- If Federal agencies are required by law or Executive Order to implement the Framework, then the NIST audits of each agency shall be based on the guidance it provides to agencies (described above) and the metrics developed by the Federal working group (described above).

AUDIT REPORT -- A report of each Federal agency audit shall be transmitted to OMB, OSTP, the U.S. Government Accountability Office, the agency being audited, the agency's Office of Inspector General if it has one, and Congress, including the House Science, Space, and Technology Committee and the Senate Committee on Commerce, Science, and Transportation.

LETTER OF SUPPORT FOR H.R. 1224

PRESS RELEASE

FOR IMMEDIATE RELEASE March 1, 2017

Larry Clinton
President and CEO, Internet Security Alliance
(202) 236-0001
lclinton@isalliance.org

ISA SEES BILL ON NIST FRAMEWORK AS STEP IN THE RIGHT DIRECTION

(WASHINGTON, D.C.) – The Internet Security Alliance said today that the legislation the House Science Committee is scheduled to consider this week is a step in the right direction, and that it hopes to work with the Committee to refine it as it moves forward through the legislative process.

The bill calls on NIST to define what constitutes use of the NIST Cybersecurity Framework and develop outcome-based and quantifiable metrics to help federal agencies analyze and assess the effectiveness of the Framework.

"Given the increasing severity of the cyber threat, it is essential that we clarify basic elements of the Framework, such as defining what it means to use the Framework and what it means to be effective," said Larry Clinton, President of the ISA. "This bill takes the important first steps to resolve these problems and allows the private sector the opportunity to voluntarily follow as they see fit."

ISA has long called for evaluating the Framework for not only effectiveness and prioritization, but also cost-effectiveness, as called for in President Obama's Executive Order 13636, and is encouraged by the Committee's work. While the bill does not call for a cost-benefit analysis, it does call for developing a template for federal agencies on how to use the Framework, which the private sector could, in effect, voluntarily adopt as implementation models and modify for use for their particular sector.

"We are long past the time where we can rely on anecdotal reports from various entities as to how the Framework is being used. Three years after its release, we have no objective data that reliably tells us if the existence of the Framework has actually changed behavior, if those changes have actually improved security, and critically if use of the Framework is cost effective. We look forward to working with the Committee to add this critical piece of the Framework, as called for in the Executive Order that created the Framework in 2013," Clinton said. "Companies will naturally use elements of the Framework that have been shown to be cost effective. Having data like this – even it is just from federal agencies – would be one of the best bulwarks we can have against creating a regulatory environment in cybersecurity."

"While the bill does not address the need for a cost-benefit analysis of the Framework – which is something ISA will like to see in the near future – this bill is a positive step to creating a sustainable cybersecurity system," said Clinton. "ISA applauds the House Science Committee's efforts to address the systemic issues within cyber space."

About ISA: *The Internet Security Alliance (ISA) is a trade association with members from virtually every critical industry sector. ISA's mission is to integrate advanced technology with economics and public policy to create a sustainable system of cybersecurity. ISA pursues three goals: thought leadership, policy advocacy and promoting sound security practices. ISA's "Cybersecurity Social Contract" has been embraced as the model for government policy by both Republicans and Democrats. ISA also developed the Cyber Risk Handbook for the National Association of Corporate Directors. For more information about ISA, please visit www.isalliance.org or 703-907-7090.*

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PROCEEDINGS OF THE FULL COMMITTEE MARKUP: H.R. 1430, HONEST AND OPEN NEW EPA SCIENCE TREATMENT ACT OF 2017 (HONEST ACT); AND H.R. 1431, EPA SCIENCE ADVISORY BOARD REFORM ACT OF 2017

THURSDAY, MARCH 9, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 9:37 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recess at any time, and without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee Rule II(e) and House Rule 112(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today we meet to consider two bills. The first is H.R. 1430, the *Honest and Open New EPA Science Treatment Act of 2017*, or the *HONEST Act*, and H.R. 1431, the *EPA Science Advisory Board Reform Act of 2017*. I'll recognize myself for an opening statement and then the Ranking Member.

H.R. 1430

Chairman SMITH. Pursuant to notice, I now call up H.R. 1430, the *Honest and Open New EPA Science Treatment Act for 2017*, or the *HONEST Act*. The clerk will report the bill.

The CLERK. H.R. 1430, a bill to prohibit the Environmental Protection Agency from proposing, finalizing or disseminating regulations or assessments——

Chairman SMITH. OK. And without objection, the bill is considered as read and open for amendment at any point, and I'll continue with my opening statement.

H.R. 1430 is a short, 4-page, commonsense bill that simply requires the Environmental Protection Agency to base its regulations on science that is publicly available, not secret. In the last Congress, a similar bill, the *Secret Science Act*, passed the House with bipartisan support.

Today's legislation, which I introduced with Democratic Representative Henry Cuellar, ensures sound science is the basis for EPA decisions and regulatory actions. The days of trust-me science are over. In our modern information age, Federal regulations should be based only upon data that is available for every American to see and can be subjected to independent review. That's the scientific method.

We can all agree that the government should rely on the best available science. Unfortunately, the government does not always hold to this standard. Looking at the EPA's past record, it is clear that the Agency has not followed an open and honest process. For example, nearly every major air quality regulation from the previous Administration was justified by studies using data that even the EPA had not seen. This means that the EPA's claims about the costs and benefits of its regulations and the real risks they are meant to address cannot be independently evaluated by unbiased experts. If EPA's mandates are really based on sound science, then show Americans the data. EPA's refusal to cooperate leads to the question: What are they hiding?

Perhaps the most burdensome Obama-era regulation is the Clean Power Plan. This rule mandates what types of energy we can and cannot use and would regulate all of the Nation's electricity supply. The proposal would cost billions of dollars annually, kill thousands of jobs, and increase electricity costs for everyone, all while having a minimal benefit on the environment.

In fact, the Clean Power Plan would only reduce global temperatures by three one-hundredths of a degree Celsius and reduce sea-level rise by the thickness of only three sheets of paper. How can these miniscule benefits be justified, particularly given the adverse impacts of the regulation? Again, the EPA should show Americans the data they claim justifies their regulations.

We all care about the environment. We share a common goal to protect the lands we farm and the water we drink. But if policies aren't based on legit science, stringent regulations and unachievable results in economic hardship with little or no environmental benefit. In other words, the regulations would be all pain and no gain.

Instead of producing policies that protect the environment, it appears that the EPA is more concerned with pushing a political agenda. This is why outside independent review should be required. It's impossible to conduct a policy debate without all the facts.

The bill before us strengthens previous House-passed legislation in the 114th Congress, the *Secret Science Reform Act*. That bill also required the EPA to base its decisions on information available to scientists and the American public. This year's legislation improves on the bill that passed in the last Congress. It adds provisions to better protect personally identifiable information and confidential business information as well. It also stipulates that this bill does not retroactively apply to past regulations, but instead focuses on new regulations. It stipulates that this bill does not retroactively apply to the past regulations. This allows the EPA to focus its limited resources on quality science that all researchers can examine.

This bill will promote sound science and restore confidence in the EPA decisionmaking process. This bill ensures that the EPA is not promoting a one-sided ideological agenda. The legislation provides an opportunity for the type of honest and accountable government that the American people want and deserve.

So I urge my colleagues to support the *HONEST Act*.

PREPARED STATEMENT OF CHAIRMAN SMITH

H.R. 1430, the *Honest and Open New EPA Science Treatment Act of 2017*, or *HONEST Act*, is a short, four page, common-sense bill that simply requires the Environmental Protection Agency (EPA) to base its regulations on science that is publicly available, not secret.

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It also stipulates that this bill does not retroactively apply to past regulations, but instead focuses on new regulations.

This allows the EPA to focus its limited resources on quality science that all researchers can examine. This bill will promote sound science and restore confidence in the EPA decision-making process.

This bill ensures that the EPA is not promoting a one-sided ideological agenda. The legislation provides an opportunity for the type of honest and accountable government that the American people want and deserve. I urge my colleagues to support the *HONEST Act*.

Chairman SMITH. Before yielding to the Ranking Member, without objection, I'd like to add the following letters of support for H.R. 1430 into the record. They would be US Chamber of Commerce, Independent Petroleum Association of America, American Exploration and Production Council, Princeton and CO2 Coalition, Cato, National Association of Home Builders, the Small Business and Entrepreneurship Council.

With that, I'll yield to the Ranking Member, the gentlewoman from Texas, Eddie Bernice Johnson.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

Today we will be revisiting two bills this Committee considered in the previous two Congresses: The *Secret Science Reform Act*, which is now renamed the *HONEST Act*, and the EPA Science Advisory Board Reform Act. As in those prior congresses, today I will be strongly opposing passage of each of these misguided pieces of legislation.

At the outset, let me say that the cosmetic changes that were made to the *Secret Science Reform Act* in arriving at the *HONEST Act* do nothing to address the larger issues with this bill. Under the current legislation, the EPA would have to publicly distribute any scientific data relied upon for a covered action. EPA could withhold from public distribution items containing trade secrets or personal information. However, under this bill, anyone could then access this sensitive data after signing a confidentiality agreement with the EPA. Since the EPA is not authorized to issue confidentiality agreements for third-party researchers, this legislation would have the same effect as the *Secret Science Reform Act*: Limiting the ability of the EPA to use the best science.

Since we have some new Members on the Science Committee, I think it might be instructive to remind folks how we got to today's markup of the *HONEST Act*. Several years ago a tobacco industry consultant attempted to obtain access to the American Cancer Society's epidemiology data. He was denied access to that data due to his extensive prior connections with the tobacco industry and prior misuse of American Cancer Society data. Then the Chairman came to his aid, by subpoenaing the EPA to provide the Committee with the data used in two seminal health studies conducted by Harvard and the American Cancer Society, not the EPA or the government. This data contained the personal health histories of tens of thousands of American citizens. Thankfully, since EPA did not possess this data, they were unable to provide it to the Committee. I say this because the Chairman had indicated his intent to publicly distribute these tens of thousands of people's health histories over the internet—a horrifying prospect.

However, that answer didn't satisfy the Majority. The Majority's solution to this manufactured problem was the *Secret Science Reform Act*. At the legislative hearing on this bill, the Majority invited three witnesses with extensive ties to the tobacco industry. And this would be a theme that would continue. The groups that endorsed the Majority's bill are a who's who of toxic chemical manufacturers.

On the other hand, groups that opposed the bill included the American Association for the Advancement of Science, the American Lung Association, the American Association for Justice, the

Union of Concerned Scientists, the Natural Resources Defense Council, and a host of other public health and environmental groups. The differences in those two groups underscores the real intent of this legislation: To undermine the science that EPA can use in their work, and ultimately, make it easier to pollute in our country.

If this bill were enacted, EPA could be crippled, and the result would be more sick Americans and more dead Americans.

Now, before I conclude, I'd like to say to Mr. Chairman and the Committee, I have several letters of opposition that I'd like to place in the record from the Union——

Chairman SMITH. Without objection.

8 March 2017

The Honorable Lamar Smith
2321 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Eddie Bernice Johnson
2317 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson:

On behalf of the American Geophysical Union (AGU) and its more than 60,000 members, I am writing to express concerns about the Honest and Open New EPA Science Treatment Act of 2017 (HONEST Act) and the EPA Science Advisory Board Reform Act of 2017. We encourage you and your colleagues to take additional time to evaluate the unintended consequences of these bills before the bills move forward.

Although we appreciate the HONEST Act's protections for confidential information, we remain concerned about several provisions in the bill. For example, requirements in the bill for the use of "best available science," "data," and "reproducible" do not have uniform applications across all disciplines.

With respect to reproducibility of research, some scientific research involves longitudinal studies that are so large and of great duration that they could not realistically be reproduced. The same may be true for scientific data from a one-time event (e.g., Deepwater Horizon Gulf oil spill) where the data is gathered in real time. We're concerned that in these situations the EPA could be constrained from using important or relevant research in making decisions.

The legislation could also impose costs on recipients of federal research grants where the research results are expected to be "relied on to support a covered action." The bill is not clear on whether it is the EPA's or the research institution's responsibility to cover the costs associated with sharing and archiving this information.

We are also troubled by the implications of the EPA Science Advisory Board Reform Act. As an organization that represents scientists from broad backgrounds and expertise, we appreciate the attempt to ensure a diverse panel of scientific knowledge and perspectives, and support the bill's goal of increasing accountability and transparency for scientific advisors. However, because the bill would exclude some scientists with substantial expertise in their fields from the Science Advisory Board (SAB), the SAB would suffer from the exclusion of valuable insight. The purpose of the SAB is to review the quality and robustness of scientific data that informs EPA's

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regulatory process. It is imperative that the SAB comprise the most expert, independent scientists and technical advisors to best fulfill that mission.

AGU looks forward to working with you on these critical issues in the future.

With best wishes,

Lexi Shultz

Lexi Shultz
Director of Public Affairs
American Geophysical Union

EDF ACTION
Advocacy partner of Environmental Defense Fund

March 8, 2017

Honorable Lamar Smith
Chairman
Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Honorable Eddie Bernice Johnson
Ranking Member
Committee on Science, Space, and Technology
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

The Environmental Defense Action Fund strongly opposes the "Honest and Open New EPA Science Treatment (HONEST) Act of 2017" and the "EPA Science Advisory Board Reform Act of 2017".

Despite their benign-sounding titles, these bills would have devastating effects on public health and the Environmental Protection Agency's (EPA) ability to consider and use sound science.

The HONEST Act, a rebranded version of the "Secret Science Reform Act" from prior sessions of Congress, is framed as a measure to increase transparency by requiring that EPA only use studies that are publicly available online and replicable. Yet, as testimony before your Committee has made clear, these requirements would in many cases prevent the EPA from using the best available science for public health decision-making.

Many epidemiological studies – for example a study on the causes of breast cancer – rely on health data that are legally confidential. This legislation suggests that EPA will be given the authority to disclose confidential medical information on breast cancer patients to anyone willing to sign a confidentiality agreement. EPA would also be responsible for identifying and redacting any information that should not be made broadly publicly available in the first place. Not only is this not an appropriate role for EPA, it could severely restrict both the number of studies EPA can use and the willingness of participants to be part of vital health studies.

In addition, the Act's requirements for replicability mean that critical longitudinal studies that follow health outcomes of individuals or groups over years, even decades, could not be used because—

(1) they are inherently not replicable (e.g., a study that follow health outcomes of first responders following a single event such as the tragic 9/11 attack); or
(2) where they are replicable, it would take years to show that the results could be reproduced (e.g., a study that examines the impacts on intelligence at childhood from environmental exposures that occurred *in utero*).

Furthermore, even if, say, a longitudinal study that follows a cohort of individuals over 20 years could in principle be reproduced, there are practical and ethical reasons why it couldn't or shouldn't be. The same goes for a long-term environmental monitoring study, or data collected from a one-time event like the Deepwater Horizon Spill.

The Congressional Budget Office (CBO) has found[1] that previous iterations of this legislation would impede the number of studies the EPA can rely on—by their estimate, reducing the number of studies by half. Restricting EPA to just some of the existing scientific literature will prevent the agency from using the latest and most accurate science when developing regulations. Moreover, the tremendous resource burden of making data publicly available (CBO's central estimate was $250 million a year) would create a strong incentive to reduce the amount of scientific data and analysis considered as part of decision-making. The net effect would be to undermine EPA's ability to rely on the best available science and unnecessarily put the public at greater environmental and health risk.

Similarly, the EPA Science Advisory Board Reform Act of 2017 undermines scientific integrity of the EPA. Contrary to longstanding practice, the bill allows individuals with financial conflicts of interest to serve on the EPA Science Advisory Board (SAB) so long as those conflicts are disclosed. This would permit an infusion of special corporate interest into what should remain an objective scientific review of EPA work products.

Incredibly, at the same time, the bill makes it more difficult for academic experts to participate on the SAB. The bill considers an expert's research on a topic covered by the Board to be a conflict of interest, when in fact the academic's expertise would make them more, not less, valuable. In addition, receipt of EPA research grants and contracts, standard for universities, would be construed to constitute a conflict of interest for a scientist or expert. And a SAB member would be precluded from accepting any such grant or contract for three years after serving on the board which may deter qualified experts from serving on the SAB.

The "Honest and Open New EPA Science Treatment (HONEST) Act of 2017" and the "EPA Science Advisory Board Reform Act of 2017" would block the use of sound science by EPA in developing public safeguards. For these reasons, EDF Action strongly opposes these bills.

Sincerely,

Elizabeth B. Thompson

Elizabeth B. Thompson, President
Environmental Defense Action Fund

[1] https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/costestimate/hr1030.pdf

March 8, 2017

Dear Representative:

The undersigned health and medical organizations are writing to express our opposition to the EPA Science Advisory Board Reform Act of 2017 and the Honest and Open New EPA Science Treatment Act of 2017. Our organizations are dedicated to saving lives and improving public health.

Science is the bedrock of sound medical and public health decision-making. The best science undergirds everything our organizations do to improve health. Under the Clean Air Act, EPA has long implemented a transparent and open process for seeking advice from the medical and scientific community on standards and measures to meet those standards. Both of these bills would restrict the input of scientific experts in the review of complex issues and add undue industry influence into EPA's decision-making process.

As written, the EPA Science Advisory Board Reform Act would make unneeded and unproductive changes that would:

- Restrict the ability of scientists to speak on issues that include their own expertise;
- Block scientists who receive any EPA grants from serving on the EPA Scientific Advisory Board, despite their having the expertise and conducted relevant research that earned them these highly competitive grants;
- Prevent the EPA Scientific Advisory Board from making policy recommendations, even though EPA administrators have regularly sought their advice in the past;
- Add a notice and comment component to all parts of the EPA Scientific Advisory Board actions, a burdensome and unnecessary requirement since their reviews of major issues already include public notice and comment; and
- Reallocate membership requirements to increase the influence of industry representatives on the scientific advisory panels.

In short, EPA Science Advisory Board Reform Act would limit the voice of scientists, restrict the ability of the Board to respond to important questions, and increase the influence of industry in shaping EPA policy. This is not in the best interest of the American public.

We also have concerns with the HONEST Act. This legislation would limit the kinds of scientific data EPA can use as it develops policy to protect the American public from environmental exposures and permit violation of patient confidentiality. If enacted, the legislation would:

- Allow the EPA administrator to release confidential patient information to third parties, including industry;
- Bolster industry's flawed arguments to discredit research that documents the adverse health effects of environmental pollution; and

- Impose new standards for the publication and distribution of scientific research that go beyond the robust, existing requirements of many scientific journals.

Science, developed by the respected men and women scientists at colleges and universities across the United States, has always been the foundation of the nation's environmental policy. EPA's science-based decision-making process has saved lives and led to dramatic improvements in the quality of the air we breathe, the water we drink and the earth we share. All Americans have benefited from the research-based scientific advice that scientists have provided to EPA.

Congress should adopt policy that fortifies our scientists, not bills that undermine the scientific integrity of EPA's decision-making or give polluters a disproportionate voice in EPA's policy-setting process.

We strongly urge you to oppose these bills.

Sincerely,

Harold P. Wimmer
National President and CEO
American Lung Association

Stephen C. Crane, PhD, MPH
Executive Director
American Thoracic Society

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2397 Shattuck Avenue, Suite 203, Berkeley, CA 94704-1567 t 510.843.1872 f 510.843.3785
One North LaSalle Street, Suite 1904, Chicago, IL 60602-4064 t 312.578.1750 f 312.578.1751

March 09, 2017

Dear Representative:

The Union of Concerned Scientists, with 500,000 members and supporters throughout the country, **strongly opposes H.R. 1430**, the misleadingly named Honest and Open New EPA Science Treatment Act (HONEST Act) of 2017. The proposal shows that supporters of this legislation have a fundamental misunderstanding of the process by which science operates and is ultimately a solution in search of a problem.

This legislation would require that all raw data, models, code, and other materials from scientific studies be made available to the public before a federal agency could use it. But, the Environmental Protection Agency (EPA) already is exhaustingly transparent and the science it relies on to make decisions is made available to the public.

The true intention of this bill is not to increase transparency in agency use of science in policymaking, but rather to handcuff the EPA from ever using critical information necessary to follow through on statutorily required rulemaking for popular legislation like the Clean Air Act and the Clean Water Act. The additional restrictions imposed by this proposed bill would make it almost impossible to base public protections on the best available scientific information. In particular, if enacted, the language appears to indicate that the EPA would be inhibited by the following challenges:

- **The EPA wouldn't be able to use most health studies.** It should be expected that any agency tasked with protecting public health should be able to use public health data. The confidentiality of such data is usually protected by institutional review boards (IRB) to insure the privacy of the participants; thus, the data could not be made publicly available as demanded. Since many EPA rules are health-based standards, this rule would severely restrict the ability of the agency to base rules on science.

- **The EPA wouldn't be able to draw from industry data sources.** The agency would be prevented from using data provided by industry to the agency. Since information from industry sources is often not publicly available, to protect proprietary data from their competitors, a law requiring as such would prevent the agency from utilizing industry data, a source of information that often provides otherwise unknown data to inform EPA rule-making.

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- **The EPA wouldn't be able to use new and innovative science.** New scientific methods and data may be restricted by intellectual property protections or industry trade secret exemptions. This bill doesn't include protections for intellectual property, and it makes industry trade secrets available upon request to anyone who signs an agreement. If researchers and industry knew that sharing their science with the EPA meant that their intellectual property would be exposed to the world, they might opt out. This would limit EPA's ability to rely on the best available science including novel approaches that may not yet be publicly available.

- **Long-term and meta- analyses would be unavailable.** Many of the public health and safety issues facing the nation cannot be measured within a small timeframe. The EPA needs long-term exposure studies that assess the link between chronic diseases/mortality and pollutants; or on meta- analyses that include many different studies and locations to provide a more robust look at the science. In H.R. 1430, the provision that studies be conducted "in a manner that is sufficient for independent analysis and substantial reproduction of research" may prevent use of these vital studies by the EPA, as it is unclear whether such spatially and temporally comprehensive studies would be considered "sufficient for substantial reproduction."

- **The CBO estimates exorbitant costs.** The attempt to implement this law would also make the EPA process much more costly. For past iterations of this legislation, the CBO has estimated[1] it may take up to $250 million annually for the EPA simply to comply, and that doesn't even account for the lost benefits from delaying the protections themselves. Compounded with the cuts to EPA's budget that are being proposed, this would just further prevent the agency from being able to do its job.

H.R. 1430 makes a token attempt to address some of the criticisms about privacy concerns for personal medical information and trade secrets. But in practice, the challenge of identifying and redacting all protected and privileged information sets up a series of hurdles and complications that will deter agencies from using the best scientific analysis to inform their work.

Small, cosmetic tweaks do not change the fact that this bill is based on a flawed premise and that the authors of the legislation do not understand the scientific process. Furthermore, the burden imposed on the EPA to redact documents would ultimately place limits on the amount of actual scientific work the EPA can do. The EPA does not exist in a world of infinite resources.

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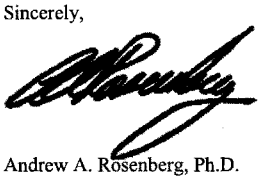
[1] https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/costestimate/hr1030.pdf

When this bill was introduced in the 114th Congress as the "Secret Science Reform Act," it received a veto threat[2] from the Obama administration, which noted that it would "interfere" with the EPA's ability to protect public health, safety, and the environment. The worry is that now, with an administration that has shown zero interest in using science to enact safeguards, this legislation could cripple the agency.

I strongly urge you to oppose H.R. 1430, the so-called HONEST Act. The only honest thing about this legislation is that it truly opens the window into the real intentions of the supporters of the bill, and that is to stop the EPA from fulfilling its science-based mission to protect public health and the environment. H.R. 1430 is a wolf in sheep's clothing, purporting to increase public accessibility to data used in rulemaking, while actually crippling the EPA's ability to use the best available scientific and technical information to protect public health and the environment.

Agencies protecting our public health should be able to use public health data and attempts to undermine agencies shouldn't be cloaked in false transparency. This Trojan-horse transparency bill would inhibit the EPA's ability to carry out its science-based mission to protect human health and the environment. It does not deserve your support.

Sincerely,



Andrew A. Rosenberg, Ph.D.
Director, Center for Science and Democracy
Union of Concerned Scientists

[2] https://obamawhitehouse.archives.gov/sites/default/files/omb/legislative/sap/114/saphr1030r_20150303.pdf

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March 09, 2017

Dear Representative:

The Union of Concerned Scientists **strongly opposes H.R. 1431**, the EPA Science Advisory Board Reform Act of 2017. The independence of the Environmental Protection Agency's (EPA) Science Advisory Board (SAB) and its ability to continue its work with the caliber of experts it currently employs would be seriously jeopardized if this proposal were to become law.

This proposal would make it nearly impossible for the SAB to do the crucial independent evaluations of EPA scientific analyses that enable the agency to protect public health and the environment. This bill opens the door for more corporate influence on the Board, because the bill explicitly stipulates that experts with financial ties to corporations affected by SAB assessments are "not excluded." This signal likely will increase the number of conflicted SAB members and stack the panel with appointees who may directly benefit from the panel's activity. At a time when the ability of corporations to influence policy has significantly increased under this administration, It strikes at the heart of the whole concept of independent review.

While the legislation encourages experts with regulated industry ties to join the SAB, it also establishes significant roadblocks for academic experts to meaningfully participate by banning experts' participation in "advisory activities that directly or *indirectly* involve review and evaluation of their own work." This effectively turns the idea of conflict of interest on its head, with the bizarre presumption that corporate experts with direct financial interests are not conflicted while academics who work on these issues are. The notion that a member of the SAB cannot fully participate in a discussion that touches upon the member's own work is counterproductive and goes far beyond common-sense limits.

While SAB experts with published, peer-reviewed research should be able to address topics on which they have credentials, the language in the bill is vague and raises many questions. Generally, experts have developed their knowledge base over time, and not purely through peer-reviewed publications. How is an academic scientist supposed to make that distinction? What happens if a scientist relies on expertise that is not specifically permitted in the bill? Will there be legal ramifications? Clearly, scientific experts will think twice before joining the SAB if it means they will have to consult their lawyers before they give their advice to the EPA administrator.

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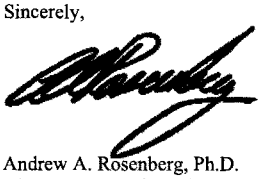
The bill slightly differs from previous versions because it now includes a provision that board members may not have current contracts with the EPA or "shall not apply for a grant or contract for 3 years following the end of that member's service on the Board." This is a senseless provision in the bill. EPA awards grants to academic scientists to learn more about scientific topics without a policy agenda and grantees are free to conduct the science and produce results any way they want, free from political or undue influence. There is no predetermined or desired outcome and the grant process is a completely separate from EPA policy actions. Conflating the SAB's activity with EPA grants is to completely misunderstand how the awarding of research grants work at the agency.

Another new provision to H.R. 1431 would discourage members of the public to provide feedback to the SAB by limiting the number of similar comments that could be considered in the record. This directly impacts members of the public who sign their name to comments initiated by nonprofit organizations with a strong grassroots presence. If the thousands of comments submitted on a certain issue are only considered as one, the voices of all of those individuals would be effectively silenced. It is as much anti-democratic as it is anti-science and effectively diminishes the voice of communities most often bearing the brunt of environmental or health impacts that the SAB is charged with analyzing.

There are a number of other concerns with the bill, including limitless comment periods that could be initiated by members of the public who do not believe in the EPA's mission. This could cripple the ability of the SAB and the EPA to address some of the most pressing and complex scientific challenges of the day.

Proponents of the legislation might argue that the EPA SAB is 'stacked' with scientists, and that should not be an argument in favor of the bill. It is the role of the SAB to have the necessary issue experts to protect public health and safety and help fulfill the EPA's science-based mission. This bill would not improve the work of the Board, and would make it more difficult for the EPA to receive the independent science advice it needs to do its work. **We strongly urge your opposition to H.R. 1431**.

Sincerely,



Andrew A. Rosenberg, Ph.D.
Director, Center for Science and Democracy
Union of Concerned Scientists

Ms. JOHNSON [continuing]. Of Concerned Scientists, the Environmental Defense Fund, the American Geophysical Union, the American Thoracic Society, and the American Lung Association all opposing these bills and all who recognize the danger these bills pose to the private health information of Americans. Trade secrets of industries, and the ability of the Environmental Protection Agency to protect the public health and environment.

Thank you, Mr. Chairman. I yield back

PREPARED STATEMENT OF MS. JOHNSON

Thank you Chairman Smith. Today we will be revisiting two bills this committee considered in the previous two congresses: The *Secret Science Reform Act*, which is now renamed the *HONEST Act*, and the *EPA Science Advisory Board Reform Act*. As in those prior congresses, today I will be strongly opposing passage of each of these misguided pieces of legislation.

At the outset, let me say that the cosmetic changes that were made to the *Secret Science Reform Act* in arriving at the *HONEST Act* do nothing to address the larger issues with this bill. Under the current legislation, the EPA would have to publicly distribute any scientific data relied upon for a covered action. EPA could withhold from public distribution items containing trade secrets or personal information. However, under this bill anyone could then access this sensitive data after signing a confidentiality agreement with the EPA. Since the EPA is not authorized to issue confidentiality agreements for third party researchers, this legislation would have the same effect as the *Secret Science Reform Act*: Limiting the ability of the EPA to use the best science.

Since we have some new Members on the Science Committee, I think it might be instructive to remind folks how we got to today's markup of the *HONEST Act*. Several years ago a tobacco industry consultant attempted to obtain access to the American Cancer Society's epidemiology data. He was denied access to that data due to his extensive prior connections with the tobacco industry and prior misuse of American Cancer Society data. Then the Chairman came to his aid, by subpoenaing the EPA to provide the Committee with the data used in two seminal health studies conducted by Harvard and the American Cancer Society. This data contained the personal health histories of tens of thousands of American citizens. Thankfully, since EPA did not possess this data, they were unable to provide it to the Committee. I say this because the Chairman had indicated his intent to publicly distribute these tens of thousands of people's health histories over the internet - a horrifying prospect.

However, that answer didn't satisfy the Majority. The Majority's solution to this manufactured problem was the *Secret Science Reform Act*. At the legislative hearing on this bill, the Majority invited three witnesses with extensive ties to the tobacco industry. And this would be a theme that would continue. The groups that endorsed the Majority's bill are a "who's who" of toxic chemical manufacturers. On the other hand, groups that opposed the bill included the American Association for the Advancement of Science, the American Lung Association, the American Association for Justice, the Union of Concerned Scientists, the Natural Resources Defense Council, and a host of other public health and environmental groups.

The differences in those two groups underscores the real intent of this legislation: To undermine the science that EPA can use in their work, and ultimately, make it easier to pollute in our country. If this bill were enacted, EPA could be crippled, and the result would be more sick Americans and more dead Americans.

I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

Are there any amendments to this bill, or does the gentlewoman from Oregon wish to be recognized, and if so——

Ms. BONAMICI. Yes. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. BONAMICI. Thank you very much, Mr. Chairman.

When I'm home in Oregon and talk about serving on the Science Committee, a committee with tremendous potential, my constituents ask me what are we doing to promote more research and investment in technology that will drive down the cost of renewable

energy and reduce our country's dependence on fossil fuels. They wonder what we're doing to protect our coastline from ocean acidification and threats of tsunami. They want the local Superfund site cleaned up, and they don't want cuts to the EPA budget. They aren't asking us to spend time challenging the data behind the research that supports important regulations that help keep our air and water clean, and they certainly aren't asking this Committee to spend time putting more industry representatives and fewer scientists on the EPA's Science Advisory Boards.

Yet we're here today considering these bills when there's so many other things and more meaningful policies we should be discussing. Congress, especially the Science Committee, has a responsibility to act to preserve our planet's health and stabilize the threats to our environment and our economy, threats that are serious and detrimental to the planet if we do nothing. Climate change is real and it's advancing. We had a very warm February. Global sea levels are rising, ice sheets are melting and shrinking at alarming rates. The health of our oceans is at risk. The acidity of our surface ocean waters is rapidly increasing, and the upper layers of the ocean are absorbing about 2 billion tons of carbon dioxide every year.

Unfortunately, the new Environmental Protection Agency Administrator appears to have little appreciation for the role of the Agency in protecting the environment. In his first days at the EPA, Administrator Pruitt has started the process of rolling back protections for our water, our streams, and walking away from collecting data on methane emissions. According to a recent New York Times article, he is filling the Agency with climate change skeptics and deniers, and as former Administrator Gina McCarthy remarked, "Here for the first time I see someone who has no commitment to the mission of the Agency."

By considering the bills before us today, this Committee is ignoring our responsibility to protect the environment. The completely unnecessary so-called *HONEST Act* will undermine Americans' privacy rights by allowing personally identifiable information to be public at the Administrator's discretion, and the EPA Science Advisory Board will not further the Agency's mission of protecting human health and the environment. The bill aims to pack the Science Advisory Board with industry representatives while leaving out knowledgeable scientists who actually do EPA-funded research.

Now, I'm proud to have worked with so many of you across the aisle during my years on this Committee. I ask that we take a step back to reflect on the mission of the EPA and think about how we can work together to make our environment and our economy thrive for future generations. Let's reject these partisan bills today and find some commonsense policies we can agree on that will move our country forward.

Thank you, Mr. Chairman, and I yield back.

Chairman SMITH. Thank you, Ms. Bonamici.

And the gentleman from Virginia, Mr. Beyer, is recognized for 5 minutes.

Mr. BEYER. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. BEYER. Thank you, Mr. Chairman.

Mr. Chairman, I have a number of objections to this proposal which I'll briefly share now and then submit my extended remarks for the record later.

First, while the ability to reproduce work is crucial to the scientific process, we should not focus so heavily or exclusively on reproducibility. Not all work that's reproducible is right, and just because it is not reproducible does not make it wrong. Funding agencies, scientific journals, and the EPA have worked on their own over the last few years to enact policies and best practices that encourage a more open process that can be easily reproduced.

But we need to think of some of the most catastrophic public health threats that have occurred over the last 35 years or so, events we need to study but could not possibly reproduce: Ash clouds and dust caused by Mt. St. Helens eruption in 1980, extensive flooding and damage caused by Hurricane Katrina in 2005, the massive Gulf oil spill resulting from Deepwater Horizon explosions in 2010, the fires, fumes and dust in New York caused by the collapse of the Twin Towers on 9/11, the Aliso Canyon gas leak in 2015, or even the oft-studied, oft-hearing Gold King Mine spill in 2015. How could we possibly reproduce these large and unpredictable events in exactly the same way? We can't, but does this mean we should no longer study the impact of these nationally important events? I hope not because the American people need answers because their health depends on it.

Second, many of my Federal employee constituents and I take offense at the title of this legislation, the *HONEST Act*, which seems to somehow imply that EPA employees and EPA scientists are somehow not being honest. So I want to take this opportunity to tell the hardworking, dedicated employees of the EPA and civil servants governmentwide that many in Congress recognize the significant work you do. Many in this body despite what's implied by the title of this Act hold your work in high regard, and we appreciate the substantial contributions you've made in furtherance of clean air, clean water and public health, and I hope that my Republican colleagues will soon come to realize and appreciate the vital mission of the EPA and hope they'll stop tarnishing the work and attacking the reputations of the dedicated civil servants who work to advance its mission and the health of all Americans.

I yield back, Mr. Chair.

Chairman SMITH. Thank you, Mr. Beyer.

The gentleman from California, Mr. McNerney, is recognized.

Mr. MCNERNEY. Thank you, Mr. Chairman.

What we're considering today is basically the *Secret Science Reform Act* with a new name. The bill before us today, the *Honest and Open New EPA Science Treatment Act*, is an attack on the EPA. The bill is an attempt to undermine the Clean Air Act and the progress the law has made in improving public and environmental health.

A scientist collects data for his or her research, and in order for it to be published, it must go through peer review, which the EPA then uses in developing science-based rules. The EPA identifies peer-reviewed articles in the Federal Register. The process for rulemaking is currently transparent and thorough. This bill would add

unneeded duplication and expense to the process. It's also unclear how this legislation would improve our ability to enact oversight and protections for environment and public health.

If we want to encourage businesses to develop new, innovative technologies and for our science community to be able to work without fear of retribution for their work, we must protect confidential business information. This bill has no protections for confidential business information. Without safeguards for confidential business information, businesses have no incentive whatsoever to share their information with the Federal Government and our scientists will not have the best available science for their work or to protect public health and protect the environment from harm.

This legislation illustrates a basic lack of understanding about how science and industry is conducted and will harm our ability to execute quality science. This legislation has no redeeming qualities, and I urge its opposition.

With that, I yield back.

Chairman SMITH. Thank you, Mr. McNerney.

Let me just recognize myself for a minute, and I am going to be able to point to language in the bill that might address some of the concerns that have been raised here today about the exposure of confidential information that happens to be one of the changes we made in the bill from last year to this bill is to protect that private information, and I'll be giving you that language momentarily. If you all will take a look at page 2 of the bill, lines 18 to 22, the redacted information described in paragraph 1C shall be disclosed to a person only after such person signs a written confidentiality agreement with the Administrator subject to guidance to be developed by the Administrator. So I really think we've addressed, as I say, some of the concerns that have been raised.

If there are no amendments——

Mr. PERLMUTTER. Mr. Chairman?

Chairman SMITH. The gentleman from Colorado, Mr. Perlmutter, is recognized.

Mr. PERLMUTTER. I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. PERLMUTTER. And I appreciate the Chairman and that amendment. We've seen this bill before. That amendment helped what we had last year, which was the Secret Science bill, but that was a lousy bill then and this is still a lousy bill now, even with the amendment that the Chairman has made to the bill. And, you know, the moniker, the name of this bill, the *HONEST Act*, really should be the Dishonest Act because it dishonestly describes what's going on in the Environmental Protection Agency that's looking to try to protect our environment from extreme weather events that we have in Colorado, you have on the Coast, you have all over the country and all over the world. And for this Committee to continue to, you know, put its head in the sand and ignore what's going on every day is really a problem and needs to be corrected, and the *HONEST Act* doesn't do that.

But I do want to thank the Chairman for—you know, we've had opportunity to have hearings on this bill, unlike what's going on in the Energy and Commerce Committee and the Ways and Means Committee where the entire *Affordable Care Act* is being repealed

without a single hearing, without a single witness, without a single discussion in the middle of the night, and it's that kind of hypocrisy that comes when a number of years ago there was objection to the *Affordable Care Act* saying there wasn't enough time to study it when in fact there were 79 hearings and hundreds of witnesses and hundreds and hundreds of hours of testimony. To try to ram that through at this point is a real mistake and is in contrast to actually having some regular order that we have in this Committee from time to time.

So I applaud the regular order that the Chairman conducts but I still disagree that this bill does anything to help the environment or to assist the EPA in its mission of trying to keep people healthy and keep the environment healthy.

And so with that, I urge a no vote on this bill, and I yield back to the Chair.

Chairman SMITH. Thank you, Mr. Perlmutter. We appreciate the compliment directed toward the Committee.

The gentleman from Florida, Mr. Posey, is recognized.

Mr. POSEY. Thank you very much, Mr. Chairman.

I just want to thank you for bringing this bill forward. I want to thank you for the transparent process that you allowed it to go through. This clearly is just a matter of transparency and government accountability. I don't have a single—well, I can't really say that, I have a few nuts—but most of my constituents want government to be more transparent and they want it to be more accountable, and you know, I'm just shocked there's so many people that are afraid of transparency and accountability, and I thank you for bringing forward this bill that makes it more transparent and more accountable. The citizens deserve it. And I yield back.

Chairman SMITH. Thank you, Mr. Posey.

If there are no amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 1430 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 1430 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Ms. JOHNSON. Mr. Chairman——

Chairman SMITH. A roll call vote has been requested by the Ranking Member, and the clerk will call the roll.

The CLERK. Mr. Smith?

Chairman SMITH. Aye.

The CLERK. Mr. Smith votes aye.

Mr. Lucas?

Mr. LUCAS. Aye.

The CLERK. Mr. Lucas votes aye.

Mr. Rohrabacher?

[No response.]

The CLERK. Mr. Brooks?

Mr. BROOKS. Aye.

The CLERK. Mr. Brooks votes aye.

Mr. Hultgren?

Mr. HULTGREN. Aye.

The CLERK. Mr. Hultgren votes aye.
Mr. Posey?
Mr. POSEY. Aye.
The CLERK. Mr. Posey votes aye.
Mr. Massie?
[No response.]
The CLERK. Mr. Bridenstine?
[No response.]
The CLERK. Mr. Weber?
Mr. WEBER. Aye.
The CLERK. Mr. Weber votes aye.
Mr. Knight?
Mr. KNIGHT. Aye.
The CLERK. Mr. Knight votes aye.
Mr. Babin?
[No response.]
The CLERK. Mrs. Comstock?
Mrs. COMSTOCK. Aye.
The CLERK. Mrs. Comstock votes aye.
Mr. Palmer?
Mr. PALMER. Aye.
The CLERK. Mr. Palmer votes aye.
Mr. Loudermilk?
[No response.]
The CLERK. Mr. Abraham?
Mr. ABRAHAM. Aye.
The CLERK. Mr. Abraham votes aye.
Mr. LaHood?
Mr. LAHOOD. Aye.
The CLERK. Mr. LaHood votes aye.
Mr. Webster?
[No response.]
The CLERK. Mr. Banks?
Mr. BANKS. Yes. Aye.
The CLERK. Mr. Banks votes aye.
Mr. Biggs?
Mr. BIGGS. Aye.
The CLERK. Mr. Biggs votes aye.
Mr. Marshall?
Mr. MARSHALL. Aye.
The CLERK. Mr. Marshall votes aye.
Mr. Dunn?
Mr. DUNN. Aye.
The CLERK. Mr. Dunn votes aye.
Mr. Higgins?
Mr. HIGGINS. Aye.
The CLERK. Mr. Higgins votes aye.
Ms. Johnson?
Ms. JOHNSON. No.
The CLERK. Ms. Johnson votes nay.
Ms. Lofgren?
[No response.]
The CLERK. Mr. Lipinski?
Mr. LIPINSKI. Nay.

The CLERK. Mr. Lipinski votes nay.
Ms. Bonamici?
Ms. BONAMICI. No.
The CLERK. Ms. Bonamici votes nay.
Mr. Bera?
[No response.]
The CLERK. Ms. Esty?
Ms. ESTY. No.
The CLERK. Ms. Esty votes nay.
Mr. Veasey?
[No response.]
The CLERK. Mr. Beyer?
Mr. BEYER. No.
The CLERK. Mr. Beyer votes nay.
Ms. Rosen?
Ms. ROSEN. No.
The CLERK. Ms. Rosen votes nay.
Mr. McNerney?
Mr. MCNERNEY. No.
The CLERK. Mr. McNerney votes nay.
Mr. Perlmutter?
Mr. PERLMUTTER. No.
The CLERK. Mr. Perlmutter votes nay.
Mr. Tonko?
[No response.]
The CLERK. Mr. Foster?
Mr. FOSTER. No.
The CLERK. Mr. Foster votes nay.
Mr. Takano?
Mr. TAKANO. Nay.
The CLERK. Mr. Takano votes nay.
Ms. Hanabusa?
Ms. HANABUSA. Nay.
The CLERK. Ms. Hanabusa votes nay.
Mr. Crist?
Mr. CRIST. Nay.
The CLERK. Mr. Crist votes nay.

Chairman SMITH. The gentleman from Kentucky. The gentleman is not recorded yet.

Mr. MASSIE. Yes?

Chairman SMITH. That is the correct vote. Thank you.

The CLERK. Mr. Massie votes aye.

Chairman SMITH. And the clerk will continue to report.

The CLERK. Mr. Chairman, 17 Members vote aye; 12 Members vote nay.

Chairman SMITH. OK. The ayes have it, and the bill is reported favorably.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th Congress

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: 3/9/17

Bill: H.R. 1430 Final Passage

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* - *TX*	X			
2 Mr. LUCAS – *OK* **	X			
3 Mr. ROHRABACHER – *CA*				
4 Mr. BROOKS – *AL*	X			
5 Mr. HULTGREN – *IL*	X			
6 Mr. POSEY – *FL*	X			
7 Mr. MASSIE – *KY*	X			
8 Mr. BRIDENSTINE – *OK*				
9 Mr. WEBER – *TX*	X			
10 Mr. KNIGHT – *CA*	X			
11 Mr. BABIN – *TX*				
12 Mrs. COMSTOCK – *VA*	X			
13 Mr. PALMER – *AL*	X			
14 Mr. LOUDERMILK – *GA*				
15 Mr. ABRAHAM – *LA*	X			
16 Mr. LAHOOD – *IL*	X			
17 Mr. WEBSTER – *FL*				
18 Mr. BANKS – *IN*	X			
19 Mr. BIGGS – *AZ*	X			
20 Mr. MARSHALL – *KS*	X			
21 Mr. DUNN – *FL*	X			
22 Mr. HIGGINS – *LA*	X			
1 Ms. JOHNSON, *Ranking* - *TX*		X		
2 Ms. LOFGREN –*CA*				
3 Mr. LIPINSKI – *IL*		X		
4 Ms. BONAMICI – *OR*		X		
5 Mr. BERA – *CA*				
6 Ms. ESTY – *CT*		X		
7 Mr. VEASEY – *TX*				
8 Mr. BEYER – *VA*		X		
9 Ms. ROSEN – *NV*		X		
10 Mr. MCNERNEY – *CA*		X		
11 Mr. PERLMUTTER – *CO*		X		
12 Mr. TONKO – *NY*				
13 Mr. FOSTER – *IL*		X		
14 Mr. TAKANO – *CA*		X		
15 Ms. HANABUSA – *HI*		X		
16 Mr. CRIST – *FL*		X		
17 VACANT				
TOTALS	17	12		

** Vice Chair

Without objection, the Motion to Reconsider is laid upon the table. H.R. 1430 is ordered reported to the House, and I ask unanimous consent that staff authorized to make any necessary technical and conforming changes, and without objection, so ordered.

Before we go to the next bill, I just was going to say to the Members of the Committee that we have in our audience today a high school class—seniors—from Burke, Virginia, and I want to say to the seniors from Burke, Virginia, that you are going to hear some strong language today when we talk about these bills. We don't take it personally, or we try not to. People do have legitimate differences of opinion. Bills are not always bipartisan although I will say on behalf of this Committee that of the 23 bills enacted last year that were produced by this Committee, 17 of the 23 were bipartisan. But today's bills do not enjoy that particular rank but I just want the students to know this is all part of our general debate and we understand it, we accept it, and we're still friends.

H.R. 1431

Chairman SMITH. And so we will now go to the next bill, and pursuant to notice, I now call up H.R. 1431, the *EPA Science Advisory Board Reform Act of 2017*, and the clerk will report the bill.

The CLERK. H.R. 1431, a bill to amend the *Environmental Research Development and Demonstration Authorization Act of 1978* to provide for a Science Advisory Board——

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point. And I'll now recognize the sponsor of the bill, the Vice Chairman of the Science Committee, Mr. Lucas, for an opening statement.

Mr. LUCAS. Thank you, Chairman Smith, for bringing this important legislation to a markup. H.R. 1431, the *Science Advisory Board Reform Act*, ensures that the most qualified and capable scientists are free to undertake a balanced and open review of regulatory science.

The Science Advisory Board was created in 1978 to provide independent expert advice on scientific and technical information. This information is used to justify important policy decisions and should be held to a high standard.

In the subsequent decades and years, there have been serious deficiencies with the SAB and the process to select Board Members. Among other issues, there has been limited public participation, EPA interference with expert advice, and potential conflicts of interest. If the EPA undermines the Board's independence or prevents it from providing candid advice to Congress, then the SAB serves no value to the EPA. The Board should be free to function as intended to ensure that sound science is driving policy decisions. We must reaffirm the Board's independence so that the public can be confident that policy decisions are not hijacked by a predetermined political agenda. It's time to update the law to restore scientific integrity to the process and independence to the Board.

In the previous Congress, a substantially similar bill passed the House with bipartisan support. This time around, we worked to revise this bill to ensure the best advisory process for the SAB. The *Science Advisory Board Reform Act of 2017* addresses SAB shortcomings and deficiencies by guaranteeing a well-balanced expert

panel, increasing transparency, and encouraging public participation. This employs—this empowers the experts to provide meaningful and unbiased scientific advice.

This Act also addresses the need for Board membership from State, local and tribal governments. Currently on the chartered SAB, there are only two members representing States. The fact that States like my home State of Oklahoma have no Board members, even though we play a prominent role in the agriculture and energy industries, both of which are heavily regulated by the EPA, is troubling.

Furthermore, this bill prevents current SAB members from holding EPA contracts or grants as well as from receiving those funds within 3 years following the end of that member's service on the Board.

The bill also ensures that uncertainties in scientific conclusions are clearly communicated and allows the expert panel to focus on the science, rather than partisan policy debates.

The language also codifies a requirement of the Board to respond to dissenting scientific views, and for comments to be published in the Federal Register. For ease of public access, these comments will be grouped by common theme and will not include reprinting of repetitious comments.

This legislation recognizes the important role science should play to inform policy debates. The safeguards provided in this bill will ensure public confidence by requiring the use of sound science when informing regulatory decisions. This Act restores the SAB as an important defender of scientific integrity. This common—these commonsense reforms will make EPA's decisions more credible and balanced.

PREPARED STATEMENT OF MR. LUCAS

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The Science Advisory Board (or S-A-B) was created in 1978 to provide independent expert advice on scientific and technical information. This information is used to justify important policy decisions and should be held to a high standard.

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The Board should be free to function as intended to ensure that sound science is driving policy decisions. We must reaffirm the Board's independence so that the public can be confident that policy decisions are not hi-jacked by a pre-determined political agenda.

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Board members, even though we play a prominent role in the agriculture and energy industries, both of which are heavily regulated by the EPA, is troubling. Furthermore, this bill prevents current SAB members from holding EPA grants or contracts, as well as from receiving those funds within three years following the end of that member's service on the Board.

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This legislation recognizes the important role science should play to inform policy debates. The safeguards provided in this bill will ensure public confidence, by requiring the use of sound science when informing regulatory decisions. This act restores the SAB as an important defender of scientific integrity.

These common sense reforms will make EPA's decisions more credible and balanced.

Mr. LUCAS. And without objection, Mr. Chairman, I would like to add the following letters of support for H.R. 1431 into the record.

Chairman SMITH. Without objection, the letter will be made a part of the record.

Mr. LUCAS. The Farm Bureau, the Portland Cement Association, the National Sand and Gravel Association, Small Business and Entrepreneurship Council, the National Association of Homebuilders, Dr. Pat Michaels, Professor Will Harper, the American Exploration Production Council, the Independent Petroleum Association of America, and the U.S. Chamber of Commerce.

Thank you, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Lucas.

The gentlewoman from Texas, the Ranking Member, Ms. Johnson, is recognized for her opening statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

Like the *HONEST Act*, I strongly oppose the *Science Advisory Reform Act*, and, at the core, I oppose this bill for many of the same reasons. This bill is a transparent attempt to slow down the regulatory process and stack science review boards with industry representative. The result would be similar to the *HONEST Act*: Worse science at the EPA and less public health protections for American citizens.

The problems with this legislation are three-fold. First, the bill makes it easier for industry representatives to serve on science advisory boards by only requiring them to disclose their conflicts of interest. I have no problem with industry representation on these advisory boards, and in fact, under the requirements of the Federal Advisory Committee Acts, science advisory panels are required to be balanced of composition. However, this bill would allow unlimited participation by financially conflicted industry representatives, and that is a part I cannot support.

The second major problem with this legislation is that it would make it much more difficult for scientists with extramural research grants from EPA to serve on the Board. This prohibition is likely to eliminate consideration of the top scientists in the relevant fields serving on science advisory boards. In conjunction with the loosened industry financial conflict requirements, this prohibition will result in science advisory panels with less qualified scientists and more conflicts of interest.

Finally, this legislation contains incredibly burdensome public comment requirements. The bill prevents comment cutoff dates, requires detailed review and reporting of comments, and requires the advisory panels to respond to any significant comments, especially those that run counter to mainstream science. The end result of this is to delay the Science Advisory Board's reviews and force the agency to expend resources it simply does not have.

We are in an unprecedented time right now. For the past three Congresses, the Chairman of this Majority—his Majority colleagues on the Science Committee have repeatedly attacked the ability of the EPA to use the best available science to improve public health. We now have a President who has attacked mainstream scientific views repeatedly. The threats to the scientific enterprise in America right now are profound. These threats have the potential to do great damage to American industry, American competitiveness, and the health of our citizens.

I will vigorously oppose these efforts every step of the way, and I urge my colleagues to do the same.

Thank you, Mr. Chairman. I yield back.

PREPARED STATEMENT OF MS. JOHNSON

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I yield back

Chairman SMITH. Thank you, Ms. Johnson.

Is there anyone who wishes to offer an amendment or be recognized?

Ms. BONAMICI. Mr. Chairman.

Chairman SMITH. The gentlewoman from Oregon, Ms. Bonamici, is recognized for 5 minutes.

Ms. BONAMICI. Thank you very much, Mr. Chairman, and I want to start by thanking Mr. Lucas for his goal of having a diverse functioning Science Advisory Board at the EPA. It's a laudable goal.

Unfortunately, this particular bill is not going to do what the intent is, and it has many problems that the Ranking Member pointed out, and I just want to point out, as recognized by several letters in opposition including one from the American Lung Association, that this bill is going to add this notice and comment component to all parts of the Board's actions, and that causes a burdensome and unnecessary requirement. The reviews of the major issues are already covered under public notice and comment. It's going to discourage people from participating.

And also, as the Union of Concerned Scientists points out, this legislation explicitly allows experts with financial ties to corporations that are affected by Science Advisory Board assessments, they are not excluded from the Boards, but scientists, academic experts who have experience, are prohibited, and that essentially turns, as the Union of Concerned Scientists says, the idea of conflict of interest on its head because there's a presumption that corporate experts with direct financial interest are not conflicted but academics who work on these issues are.

So I suggest that we go back to the drawing board and find a way to improve the Science Advisory Board that doesn't have these problems that are going to result in industry experts but not academic scientific experts on the Science Advisory Boards.

Thank you, Mr. Chairman, and I yield back the balance of my time.

Chairman SMITH. Thank you, Ms. Bonamici.

Anybody else? The gentleman from Illinois, Dr. Foster, is recognized for 5 minutes.

Mr. FOSTER. Yes. I move to strike the last word.

I'd just like to briefly point out that according to the Bureau of Labor Statistics, there are 1.54 million professors in the United States, so the fact that the sponsors of this bill were able to find one of those 1.54 million professors that support this bill I think speaks volumes about the level of support by academics and scientists for this bill.

Thank you, and I yield back.

Chairman SMITH. Thank you, Mr. Foster.

The gentlewoman from Connecticut, Ms. Esty, is recognized.

Ms. ESTY. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. ESTY. Thank you, Mr. Chairman.

Again, I agree with my colleague, Mr. Lucas, that we do want to have diverse viewpoints reflected in the Science Advisory Board. However, as many of my colleagues have noted, this bill, I think, fails to achieve that.

I want to note for a moment the resource question. This imposes new requirements, extends and basically eliminates any timeline for comments, and an obligation to respond. At the same time, no additional resources are called for, and that does not even begin to address the fact that the incoming Administration has proposed a

25 percent cut in agency resources—25 percent. And I think it is irresponsible for this Committee to impose additional burdens of reporting and response at the same time not only not offering resources but backing budget proposals that would do massive cut in resources.

I am very concerned about the conflicts of interest that are being proposed here. To have paid industry experts be considered independent and to have scientists who—and I have a husband who works at your alma mater, Mr. Chairman, and I can tell you, professors have to raise grant money all the time for their research. One of the few places they can do that—if you're a climate scientist or if you are looking at epidemiology at Yale, you often are seeking Federal grants. That's the only way you're going to get your research done. And yet this proposal I'm afraid would disqualify such people not only from voting on grants involving themselves, which is of course completely appropriate, but would be an out-and-out ban.

We are going to be depriving the independent Science Advisory Board of exactly the kind of capability that we need to have, and I think we're all already to work with Mr. Lucas and with you, Mr. Chairman, on what we can do to diversify. If there are sectors that feel they've been excluded, we should work on that, but this is overly broad, will be dangerous to the independence of science, exclude much of the expertise we need to have, too broad a brush and no resources, in fact, at the same time we're expecting a cut in resources.

So I respectfully must urge my colleagues to vote against this bill.

Thank you very much, and I yield back.

Chairman SMITH. Thank you, Ms. Esty.

If the gentleman from Texas will withdraw his request for time, I'd like to recognize——

Mr. BABIN. Sure.

Chairman SMITH [continuing]. Someone on the other first. The gentleman from Virginia, Mr. Beyer, is recognized.

Mr. BEYER. I feel bad taking time from the gentleman from Texas, but I move to strike the last word, Mr. Chairman.

Chairman SMITH. Mr. Beyer is recognized.

Mr. BEYER. And I just want to associate myself with the remarks of Ms. Bonamici and Ms. Esty, that while I very much respect Mr. Lucas's leadership on this bill, and I want to vote for it, but for the dilemma that we are now bringing industry representatives in as long as there's a clear disclosure of conflict of interest and yet completely excluding professors who may well have a conflict of interest even because they may be working in the future. It seems that we have tilted the scales upside down, and if what should be good for the goose, good for the gander, that if there's a disclosure, that that's the principle of participation, then let's make that fair for the professors also.

Chairman SMITH. Thank you, Mr. Beyer.

Are there other Members who wish to be recognized? If not, the gentleman from Texas, Mr. Babin, is recognized.

Mr. BABIN. Thank you, Mr. Chairman. I'd like to yield my time to the gentleman from Oklahoma, Mr. Lucas.

Mr. LUCAS. I thank the gentleman from Texas for yielding, and I've listened to the very focused and sincere points by my colleagues, but I'd have to note to everyone as we work our way through this markup, this bill does not change the fact that the EPA still chooses the members of the Board, and the issue about are the best professionals being ignored and their insights being not used is of great concern to me.

The bill also seeks to balance transparency, and we've talked about that, in the makeup and composition of the Board. In fact, financial conflicts of interest are specifically prohibited in the language, and in addition to the prohibition on conflicted individuals from participating, the bill most importantly, I think, requires members' disclosure. Let us all know what their economic interests are in the process of being on the Board.

Now, we've talked about the grants and the money, and I would remind my colleagues, considering the magnitude of the recent direct grants given to members of the SAB and the Clean Air Scientific Advisory Committee, in the past as many as 60 percent have received grants worth almost $140 million. So perhaps we should, if anything, err on the side of balancing those concerns.

Now, I know there's a legitimate concern also in the text about the unlimited comment period, but I would tell you rather that it attempts to prevent arbitrary efforts to silence important concerns. The bill does not require the Board to respond to every comment, only to make their responses to significant comments that are based on the hypothesis-based science publicly available. I think that's a very important distinction.

And the public's right to know. Let's be honest, it is important that that the public have access to this information so that they have confidence in the results. If we're asking decisions to be made that affect their lives every day at home and at business, then they have the right, I think, to have confidence and that experience will add to it.

And furthermore, I'd leave one last thought to all my colleagues here. Many of you don't know the new EPA Director personally. He is a very energetic, very bright attorney. Elections have consequences. If perhaps in the last session you were concerned about what this would do to the EPA, I would suggest to you, you should be with me now to potentially address your concerns from this point on.

Just food for thought as I ask my colleagues to pass the bill, and I yield back.

Chairman SMITH. Thank you, Mr. Babin. Thank you, Mr. Lucas.

If there are no amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 1431 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 1431 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it. The bill is ordered reported favorably but a roll call vote has been requested, and the clerk will call the roll.

The CLERK. Mr. Smith?

Chairman SMITH. Aye.

The CLERK. Mr. Smith votes aye.
Mr. Lucas?
Mr. LUCAS. Aye.
The CLERK. Mr. Lucas votes aye.
Mr. Rohrabacher?
[No response.]
The CLERK. Mr. Brooks?
Mr. BROOKS. Aye.
The CLERK. Mr. Brooks votes aye.
Mr. Hultgren?
Mr. HULTGREN. Aye.
The CLERK. Mr. Hultgren votes aye.
Mr. Posey?
Mr. POSEY. Aye.
The CLERK. Mr. Posey votes aye.
Mr. Massie?
Mr. MASSIE. Aye.
The CLERK. Mr. Massie votes aye.
Mr. Bridenstine?
[No response.]
The CLERK. Mr. Weber?
Mr. WEBER. Aye.
The CLERK. Mr. Weber votes aye.
Mr. Knight?
Mr. KNIGHT. Aye.
The CLERK. Mr. Knight votes aye.
Mr. Babin?
Mr. BABIN. Aye.
The CLERK. Mr. Babin votes aye.
Mrs. Comstock?
Mrs. COMSTOCK. Aye.
The CLERK. Mrs. Comstock votes aye.
Mr. Palmer?
[No response.]
The CLERK. Mr. Loudermilk?
Mr. LOUDERMILK. Aye.
The CLERK. Mr. Loudermilk votes aye.
Mr. Abraham?
Mr. ABRAHAM. Aye.
The CLERK. Mr. Abraham votes aye.
Mr. LaHood?
Mr. LAHOOD. Aye.
The CLERK. Mr. LaHood votes aye.
Mr. Webster?
Mr. WEBSTER. Aye.
The CLERK. Mr. Webster votes aye.
Mr. Banks?
Mr. BANKS. Aye.
The CLERK. Mr. Banks votes aye.
Mr. Biggs?
Mr. BIGGS. Aye.
The CLERK. Mr. Biggs votes aye.
Mr. Marshall?
Mr. MARSHALL. Aye.

The CLERK. Mr. Marshall votes aye.
Mr. Dunn?
Mr. DUNN. Aye.
The CLERK. Mr. Dunn votes aye.
Mr. Higgins?
Mr. HIGGINS. Aye.
The CLERK. Mr. Higgins votes aye.
Ms. Johnson?
Ms. JOHNSON. No.
The CLERK. Ms. Johnson votes no.
Ms. Lofgren?
Ms. LOFGREN. No.
The CLERK. Ms. Lofgren votes no.
Mr. Lipinski?
Mr. LIPINSKI. No.
The CLERK. Mr. Lipinski votes no.
Ms. Bonamici?
Ms. BONAMICI. No.
The CLERK. Ms. Bonamici votes no.
Mr. Bera?
Mr. BERA. No.
The CLERK. Mr. Bera votes no.
Ms. Esty?
Ms. ESTY. No.
The CLERK. Ms. Esty votes no.
Mr. Veasey?
Mr. VEASEY. No.
The CLERK. Mr. Veasey votes no.
Mr. Beyer?
Mr. BEYER. No.
The CLERK. Mr. Beyer votes no.
Ms. Rosen?
Ms. ROSEN. No.
The CLERK. Ms. Rosen votes no.
Mr. McNerney?
[No response.]
The CLERK. Mr. Perlmutter?
Mr. PERLMUTTER. No.
The CLERK. Mr. Perlmutter votes no.
Mr. Tonko?
[No response.]
The CLERK. Mr. Foster?
Mr. FOSTER. No.
The CLERK. Mr. Foster votes no.
Mr. Takano?
Mr. TAKANO. No.
The CLERK. Mr. Takano votes no.
Ms. Hanabusa?
Ms. HANABUSA. No.
The CLERK. Ms. Hanabusa votes no.
Mr. Crist?
Mr. CRIST. No.
The CLERK. Mr. Crist votes no.
Chairman SMITH. The clerk will report.

The CLERK. Mr. Chairman, 19 Members vote aye; 14 Members vote nay.

Chairman SMITH. The ayes have it, and the bill is ordered reported favorably.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th Congress

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: 3/9/17

Bill: H.R. 1431 Final Passage

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* - *TX*	X			
2 Mr. LUCAS – *OK* **	X			
3 Mr. ROHRABACHER – *CA*				
4 Mr. BROOKS – *AL*	X			
5 Mr. HULTGREN – *IL*	X			
6 Mr. POSEY – *FL*	X			
7 Mr. MASSIE – *KY*	X			
8 Mr. BRIDENSTINE – *OK*				
9 Mr. WEBER – *TX*	X			
10 Mr. KNIGHT – *CA*	X			
11 Mr. BABIN – *TX*	X			
12 Mrs. COMSTOCK – *VA*	X			
13 Mr. PALMER – *AL*				
14 Mr. LOUDERMILK – *GA*	X			
15 Mr. ABRAHAM – *LA*	X			
16 Mr. LAHOOD – *IL*	X			
17 Mr. WEBSTER – *FL*	X			
18 Mr. BANKS – *IN*	X			
19 Mr. BIGGS – *AZ*	X			
20 Mr. MARSHALL – *KS*	X			
21 Mr. DUNN – *FL*	X			
22 Mr. HIGGINS – *LA*	X			
1 Ms. JOHNSON, *Ranking* - *TX*		X		
2 Ms. LOFGREN –*CA*		X		
3 Mr. LIPINSKI – *IL*		X		
4 Ms. BONAMICI – *OR*		X		
5 Mr. BERA – *CA*		X		
6 Ms. ESTY – *CT*		X		
7 Mr. VEASEY – *TX*		X		
8 Mr. BEYER – *VA*		X		
9 Ms. ROSEN – *NV*		X		
10 Mr. MCNERNEY – *CA*				
11 Mr. PERLMUTTER – *CO*		X		
12 Mr. TONKO – *NY*				
13 Mr. FOSTER – *IL*		X		
14 Mr. TAKANO – *CA*		X		
15 Ms. HANABUSA – *HI*		X		
16 Mr. CRIST – *FL*		X		
17 VACANT				
TOTALS	19	14		

** Vice Chair

Without objection, the Motion to Reconsider is laid upon the table. H.R. 1431 is ordered reported to the House, and I ask unanimous consent that staff authorized to make any necessary technical and conforming changes, and without objection, so ordered.

Before we adjourn, I just want to thank all Members on both sides for their attendance today. I really appreciate everybody's being here. This is good for the Committee. It's good for the Members to hear the debate as well.

If there is no further discussion, that completes our business, and we stand adjourned.

[Whereupon, at 10:24 a.m., the Committee was adjourned.]

Appendix:

H.R. 1430, H.R. 1431

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[~114H1030]

[DISCUSSION DRAFT]

115TH CONGRESS
1ST SESSION

H. R. _____

To prohibit the Environmental Protection Agency from proposing, finalizing, or disseminating regulations or assessments based upon science that is not transparent or reproducible.

IN THE HOUSE OF REPRESENTATIVES

Mr. SMITH of Texas introduced the following bill; which was referred to the Committee on _____

A BILL

To prohibit the Environmental Protection Agency from proposing, finalizing, or disseminating regulations or assessments based upon science that is not transparent or reproducible.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Honest and Open New EPA Science Treatment Act of 2017" or the "HONEST Act".

1 **SEC. 2. DATA TRANSPARENCY.**

2 Section 6(b) of the Environmental Research, Devel-
3 opment, and Demonstration Authorization Act of 1978
4 (42 U.S.C. 4363 note) is amended to read as follows:

5 "(b)(1) The Administrator shall not propose, finalize,
6 or disseminate a covered action unless all scientific and
7 technical information relied on to support such covered ac-
8 tion is—

9 "(A) the best available science;

10 "(B) specifically identified; and

11 "(C) publicly available online in a manner that
12 is sufficient for independent analysis and substantial
13 reproduction of research results, except that any
14 personally identifiable information, trade secrets, or
15 commercial or financial information obtained from a
16 person and privileged or confidential, shall be re-
17 dacted prior to public availability.

18 "(2) The redacted information described in para-
19 graph (1)(C) shall be disclosed to a person only after such
20 person signs a written confidentiality agreement with the
21 Administrator, subject to guidance to be developed by the
22 Administrator.

23 "(3) Nothing in the subsection shall be construed
24 as—

25 "(A) requiring the Administrator to disseminate
26 scientific and technical information;

1 "(B) superseding any nondiscretionary statu-
2 tory requirement; or
3 "(C) requiring the Administrator to repeal, re-
4 issue, or modify a regulation in effect on the date of
5 enactment of the Honest and Open New EPA
6 Science Treatment Act of 2017.
7 "(4) In this subsection—
8 "(A) the term 'covered action' means a risk, ex-
9 posure, or hazard assessment, criteria document,
10 standard, limitation, regulation, regulatory impact
11 analysis, or guidance; and
12 "(B) the term 'scientific and technical informa-
13 tion' includes—
14 "(i) materials, data, and associated proto-
15 cols necessary to understand, assess, and ex-
16 tend conclusions;
17 "(ii) computer codes and models involved
18 in the creation and analysis of such informa-
19 tion;
20 "(iii) recorded factual materials; and
21 "(iv) detailed descriptions of how to access
22 and use such information.
23 "(5) The Administrator shall carry out this sub-
24 section in a manner that does not exceed $1,000,000 per

1 fiscal year, to be derived from amounts otherwise author-
2 ized to be appropriated.".

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[~114H1029]

.....

(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To amend the Environmental Research, Development, and Demonstration Authorization Act of 1978 to provide for Scientific Advisory Board member qualifications, public participation, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. LUCAS introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the Environmental Research, Development, and Demonstration Authorization Act of 1978 to provide for Scientific Advisory Board member qualifications, public participation, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "EPA Science Advisory Board Reform Act of 2017".

1 **SEC. 2. SCIENCE ADVISORY BOARD.**

2 (a) INDEPENDENT ADVICE.—Section 8(a) of the En-
3 vironmental Research, Development, and Demonstration
4 Authorization Act of 1978 (42 U.S.C. 4365(a)) is amend-
5 ed by inserting "independently" after "Advisory Board
6 which shall".

7 (b) MEMBERSHIP.—Section 8(b) of the Environ-
8 mental Research, Development, and Demonstration Au-
9 thorization Act of 1978 (42 U.S.C. 4365(b)) is amended
10 to read as follows:

11 "(b)(1) The Board shall be composed of at least nine
12 members, one of whom shall be designated Chairman, and
13 shall meet at such times and places as may be designated
14 by the Chairman.

15 "(2) Each member of the Board shall be qualified by
16 education, training, and experience to evaluate scientific
17 and technical information on matters referred to the
18 Board under this section. The Administrator shall ensure
19 that—

20 "(A) the scientific and technical points of view
21 represented on and the functions to be performed by
22 the Board are fairly balanced among the members of
23 the Board;

24 "(B) at least ten percent of the membership of
25 the Board are from State, local, or tribal govern-
26 ments;

1 "(C) persons with substantial and relevant ex-
2 pertise are not excluded from the Board due to af-
3 filiation with or representation of entities that may
4 have a potential interest in the Board's advisory ac-
5 tivities, so long as that interest is fully disclosed to
6 the Administrator and the public and appointment
7 to the Board complies with section 208 of title 18,
8 United States Code;
9 "(D) in the case of a Board advisory activity on
10 a particular matter involving, or for which the Board
11 has evidence that it may involve, a specific party, no
12 Board member having an interest in the specific
13 party shall participate in that activity;
14 "(E) Board members may not participate in ad-
15 visory activities that directly or indirectly involve re-
16 view or evaluation of their own work, unless fully
17 disclosed to the public and the work has been exter-
18 nally peer-reviewed;
19 "(F) Board members shall be designated as
20 special Government employees;
21 "(G) no registered lobbyist is appointed to the
22 Board; and
23 "(H) a Board member shall have no current
24 grants or contracts from the Environmental Protec-
25 tion Agency and shall not apply for a grant or con-

1 tract for 3 years following the end of that member's
2 service on the Board.
3 "(3) The Administrator shall—
4 "(A) solicit public nominations for the Board by
5 publishing a notification in the Federal Register;
6 "(B) solicit nominations from relevant Federal
7 agencies, including the Departments of Agriculture,
8 Defense, Energy, the Interior, and Health and
9 Human Services;
10 "(C) solicit nominations from—
11 "(i) institutions of higher education (as de-
12 fined in section 101(a) of the Higher Education
13 Act of 1965 (20 U.S.C. 1001(a))); and
14 "(ii) scientific and research institutions
15 based in work relevant to that of the Board;
16 "(D) make public the list of nominees, includ-
17 ing the identity of the entities that nominated each,
18 and shall accept public comment on the nominees;
19 "(E) require that, upon their provisional nomi-
20 nation, nominees shall file a written report disclosing
21 financial relationships and interests, including Envi-
22 ronmental Protection Agency grants, contracts, co-
23 operative agreements, or other financial assistance,
24 that are relevant to the Board's advisory activities
25 for the three-year period prior to the date of their

1 nomination, and relevant professional activities and
2 public statements for the five-year period prior to
3 the date of their nomination; and
4 "(F) make such reports public, with the excep-
5 tion of specific dollar amounts, for each member of
6 the Board upon such member's selection.
7 "(4) Disclosure of relevant professional activities
8 under paragraph (3)(E) shall include all representational
9 work, expert testimony, and contract work as well as iden-
10 tifying the party for which the work was done.
11 "(5) Except when specifically prohibited by law, the
12 Agency shall make all conflict of interest waivers granted
13 to members of the Board, member committees, or inves-
14 tigative panels publicly available.
15 "(6) Any recusal agreement made by a member of
16 the Board, a member committee, or an investigative panel,
17 or any recusal known to the Agency that occurs during
18 the course of a meeting or other work of the Board, mem-
19 ber committee, or investigative panel shall promptly be
20 made public by the Administrator.
21 "(7) The terms of the members of the Board shall
22 be three years and shall be staggered so that the terms
23 of no more than one-third of the total membership of the
24 Board shall expire within a single fiscal year. No member
25 shall serve more than two terms over a ten-year period.".

1 (c) RECORD.—Section 8(c) of such Act (42 U.S.C.
2 4365(c)) is amended—
3 (1) in paragraph (1)—
4 (A) by inserting "or draft risk or hazard
5 assessment," after "at the time any proposed";
6 (B) by striking "formal"; and
7 (C) by inserting "or draft risk or hazard
8 assessment," after "to the Board such pro-
9 posed"; and
10 (2) in paragraph (2)—
11 (A) by inserting "or draft risk or hazard
12 assessment," after "the scientific and technical
13 basis of the proposed"; and
14 (B) by adding at the end the following:
15 "The Board's advice and comments, including
16 dissenting views of Board members, and the re-
17 sponse of the Administrator shall be included in
18 the record with respect to any proposed risk or
19 hazard assessment, criteria document, standard,
20 limitation, or regulation and published in the
21 Federal Register.".
22 (d) MEMBER COMMITTEES AND INVESTIGATIVE PAN-
23 ELS.—Section 8(e)(1)(A) of such Act (42 U.S.C.
24 4365(e)(1)(A)) is amended by adding at the end the fol-

1 lowing: "These member committees and investigative pan-
2 els—
3 "(i) shall be constituted and operate
4 in accordance with the provisions set forth
5 in paragraphs (2) and (3) of subsection
6 (b), in subsection (h), and in subsection
7 (i);
8 "(ii) do not have authority to make
9 decisions on behalf of the Board; and
10 "(iii) may not report directly to the
11 Environmental Protection Agency.".
12 (e) PUBLIC PARTICIPATION.—Section 8 of such Act
13 (42 U.S.C. 4365) is amended by amending subsection (h)
14 to read as follows:
15 "(h)(1) To facilitate public participation in the advi-
16 sory activities of the Board, the Administrator and the
17 Board shall make public all reports and relevant scientific
18 information and shall provide materials to the public at
19 the same time as received by members of the Board.
20 "(2) Prior to conducting major advisory activities, the
21 Board shall hold a public information-gathering session to
22 discuss the state of the science related to the advisory ac-
23 tivity.
24 "(3) Prior to convening a member committee or in-
25 vestigative panel under subsection (e) or requesting sci-

1 entific advice from the Board, the Administrator shall ac-
2 cept, consider, and address public comments on questions
3 to be asked of the Board. The Board, member committees,
4 and investigative panels shall accept, consider, and ad-
5 dress public comments on such questions and shall not ac-
6 cept a question that unduly narrows the scope of an advi-
7 sory activity.

8 "(4) The Administrator and the Board shall encour-
9 age public comments, including oral comments and discus-
10 sion during the proceedings, that shall not be limited by
11 an insufficient or arbitrary time restriction. Public com-
12 ments shall be provided to the Board when received, and
13 shall be published in the Federal Register grouped by com-
14 mon themes. If multiple repetitious comments are re-
15 ceived, only one such comment shall be published along
16 with the number of such repetitious comments received.
17 Any report made public by the Board shall include written
18 responses to significant comments, including those that
19 present an alternative hypothesis-based scientific point of
20 view, offered by members of the public to the Board.

21 "(5) Following Board meetings, the public shall be
22 given 15 calendar days to provide additional comments for
23 consideration by the Board.".

1 (f) OPERATIONS.—Section 8 of such Act (42 U.S.C.
2 4365) is further amended by amending subsection (i) to
3 read as follows:
4 "(i)(1) In carrying out its advisory activities, the
5 Board shall strive to avoid making policy determinations
6 or recommendations, and, in the event the Board feels
7 compelled to offer policy advice, shall explicitly distinguish
8 between scientific determinations and policy advice.
9 "(2) The Board shall clearly communicate uncertain-
10 ties associated with the scientific advice provided to the
11 Administrator or Congress.
12 "(3) The Board shall ensure that advice and com-
13 ments reflect the views of the members and shall encour-
14 age dissenting members to make their views known to the
15 public, the Administrator, and Congress.
16 "(4) The Board shall conduct periodic reviews to en-
17 sure that its advisory activities are addressing the most
18 important scientific issues affecting the Environmental
19 Protection Agency.
20 "(5) The Board shall be fully and timely responsive
21 to Congress.".

1 **SEC. 3. RELATION TO THE FEDERAL ADVISORY COM-**
2 **MITTEE ACT.**

3 Nothing in this Act or the amendments made by this
4 Act shall be construed as supplanting the requirements of
5 the Federal Advisory Committee Act (5 U.S.C. App.).

6 **SEC. 4. RELATION TO THE ETHICS IN GOVERNMENT ACT OF**
7 **1978.**

8 Nothing in this Act or the amendments made by this
9 Act shall be construed as supplanting the requirements of
10 the Ethics in Government Act of 1978 (5 U.S.C. App.).

PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 2105, NIST SMALL BUSINESS CYBERSECURITY ACT OF 2017

TUESDAY, MAY 2, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. With the agreement of the Ranking Member and with the understanding that other Members are on their way, we're going to start our markup.

The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recess at any time, and without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee Rule II(e) and House Rule 112(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today we meet to consider H.R. 2105, the *NIST Small Business Cybersecurity Act of 2017*.

H.R. 2105

Chairman SMITH. Pursuant to notice, I now call up H.R. 2105, the *NIST Small Business Cybersecurity Act of 2017*. The clerk will report the bill.

The CLERK. H.R. 2105, a bill to require the Director of the National Institute of Standards and Technology to disseminate guidance to help reduce——

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

I'll recognize myself for an opening statement.

Welcome to today's Full Committee markup of H.R. 2105, the *NIST Small Business Cybersecurity Act of 2017*. I thank the gentleman from Florida, Mr. Webster, for introducing this important and timely bipartisan bill.

This bill directs the National Institute of Standards and Technology to provide small businesses with cybersecurity guidelines, tools, best practices, standards, and methodologies necessary to better protect themselves. This guidance will be made publicly available on NIST's and other relevant agencies' websites.

Small businesses are frequently the target of cyber-attacks, but these businesses often do not have sufficient information to adequately monitor and protect their computer systems.

This week we celebrate National Small Business Week, a decades-long tradition recognizing the many contributions made to the American economy by small businesses. Small businesses help produce a thriving economy that benefits our entire country. They bring innovative ideas, cutting-edge products and services, and jobs to the marketplace.

In my home State, for example, there are more than 2.4 million small businesses that employ almost 4–1/2 million Texans.

But even as they become more innovative, sophisticated, and productive, small businesses are drawing unwanted attention from cybercriminals. These hackers attempt to take advantage of the small businesses' limited capabilities and cyber inexperience as compared to their larger counterparts. According to the U.S. National Cyber Security Alliance, 60 percent of small businesses go bankrupt 6 months after a cyber-attack. And another institute notes that recovering from a cyber-attack can cost the average small business $690,000; for middle market companies, that cost is more than $1 million.

Today's legislation engages the services of NIST to help small businesses reduce their cybersecurity risks.

NIST experts developed a Cybersecurity Framework through collaborations between the government and private sector. This Framework is accepted and used by many private organizations to address and manage their cybersecurity risk in a cost-effective way. The guidance described in this bill to help small businesses is based on the NIST Cybersecurity Framework.

H.R. 2105 is similar to Senate bill S. 770, the *MAIN STREET Cybersecurity Act*, which the Senate Commerce, Science, and Transportation Committee favorably reported unanimously by voice vote last month. Representative Webster's bill, cosponsored by Research and Technology Subcommittee Chairwoman Barbara Comstock and Ranking Member Dan Lipinski, serves an important purpose by helping to protect small businesses from cybersecurity attacks. I thank them for their initiative on this issue and I urge my colleagues to support H.R. 2105.

PREPARED STATEMENT OF CHAIRMAN SMITH

Good morning and welcome to today's Full Committee markup of H.R. 2105, the *NIST Small Business Cybersecurity Act of 2017*. I thank the gentleman from Florida, Mr. Webster, for introducing this important and timely bipartisan bill.

This bill directs the National Institute of Standards and Technology (NIST) to provide small businesses with cybersecurity guidelines, tools, best practices, standards, and methodologies necessary to better protect themselves.

This guidance will be made publicly available on NIST's and other relevant agencies' websites.

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Chairman SMITH. The Ranking Member, the gentlewoman from Texas, Eddie Bernice Johnson, is recognized for her opening statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

H.R. 2105, the *NIST Small Business Cybersecurity Act of 2017*, addresses a significant need to provide more guidance, resources, and tools to small businesses to secure their information systems and protect the personal information of their customers.

According to the Small Business Administration, the 28 million small businesses in America account for 54 percent of all U.S. sales. Small businesses provide 55 percent of all jobs and 66 percent of all net new jobs since 1970. Small businesses play a central role in our economy. Unfortunately, the information systems and networks of small businesses are especially vulnerable. Small businesses rarely have trained cybersecurity employees and often do not prioritize cybersecurity or have the resources to do so.

The National Institute of Standards and Technology, or NIST, has been a leader in developing standards and guidelines for cybersecurity in the public and private sectors before the word "cybersecurity" was even part of our policy vocabulary.

In 2009, NIST developed a guidance document called, Small Business Information Security: The Fundamentals. The document was the result of an interagency effort and was designed to present the fundamentals of an effective small business information security program in non-technical language.

In 2014, in response to an Executive Order from President Obama, NIST published the Cybersecurity Framework for Critical Infrastructure, which we have discussed extensively in this Committee. The Cybersecurity Framework is most useful for larger businesses with at least some information technology expertise. Therefore, in November 2016, NIST published an update of their small business guidance document, using the Framework as a template.

In addition to this guidance, NIST assists small businesses directly through their work at the Cybersecurity Center for Excellence in Gaithersburg, Maryland.

Further, under the National Initiative for Cybersecurity Education, NIST leads an activity they call the Small Business Corner. In collaboration with the Small Business Administration and the FBI, they conduct training meetings on computer security for small businesses.

H.R. 2105 is consistent with all of those ongoing activities at NIST and with the agency's mission. Ideally, H.R. 2105 would also provide resources for NIST to expand these activities, because the need is clear.

Unfortunately, the Majority has once again brought up a bill directing the agency to do more with less. If this just happened occasionally, it might not be a problem. Every agency should periodically assess their programs and identify opportunities to reprioritize funding and implement new efficiencies. However, with respect to NIST in particular, the Majority has piled on one significant new responsibility after another, without providing additional funding. And now, based on the Fiscal Year 2018 Budget Blueprint, we anticipate damaging cuts to NIST from the Trump Administration.

I am pleased that we can agree on a bipartisan basis that NIST is an important agency that does excellent work across many areas with a relatively small budget. I just wish we could also agree that money does not grow on the trees at the NIST campus. We must be prepared to pay for what we value, or we will simply not accomplish the laudable goals of this legislation or any other activities we deem to be priorities.

Mr. Chairman, I support H.R. 2105, and I thank the sponsors, including Mr. Webster, Mr. Lipinski, and Ms. Rosen, and their strong support for small businesses and NIST's important role in cybersecurity. However, I am concerned that the House bill contains an explicit underfunded mandate clause and that the Senate version is silent on funding. I hope that if we have the opportunity to negotiate a conference agreement, both bodies will see fit to provide NIST with adequate resources to fulfill the mandates in this legislation.

I thank you, and yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you Mr. Chairman. H.R. 2105, the *NIST Small Business Cybersecurity Act of 2017*, addresses a significant need to provide more guidance, resources, and tools to small businesses to secure their information systems and protect the personal information of their customers. According to the Small Business Administration, the 28 million small businesses in America account for 54 percent of all U.S. sales. Small businesses provide 55 percent of all jobs and 66 percent of all net new jobs since the 1970s. Small businesses play a central role in our economy. Unfortunately, the information systems and networks of small businesses are especially vulnerable. Small businesses rarely have trained cybersecurity employees and often do not prioritize cybersecurity or have the resources to do so. The National Institute of Standards and Technology, or NIST, has been a leader in developing standards and guidelines for cybersecurity in the public and private sectors before the word cybersecurity was even part of our policy vocabulary. In 2009, NIST developed a guidance document called, Small Business Information Security: The Fundamentals. The document was the result of an interagency effort and was designed to present the fundamentals of an effective small business information security program in

non-technical language. In 2014, in response to an Executive Order from President Obama, NIST published the Cybersecurity Framework for Critical Infrastructure, which we have discussed extensively in this Committee. The Cybersecurity Framework is most useful for larger businesses with at least some information technology expertise. Therefore, in November 2016, NIST published an update of their small business guidance document, using the Framework as a template. In addition to this guidance, NIST assists small businesses directly through their work at the Cybersecurity Center for Excellence in Gaithersburg, Maryland. Furthermore, under the National Initiative for Cybersecurity Education, NIST leads an activity they call the "Small Business Corner." In collaboration with the Small Business Administration and the FBI, they conduct training meetings on computer security for small businesses. H.R. 2105 is consistent with all of these ongoing activities at NIST and with the agency's mission. Ideally, H.R. 2105 would also provide resources for NIST to expand these activities, because the need is clear. Unfortunately, the Majority has once again brought up a bill directing the agency to do more with less. If this just happened occasionally, it might not be a problem. Every agency should periodically assess their programs and identify opportunities to reprioritize funding and implement new efficiencies. However, with respect to NIST in particular, the

Majority has piled on one significant new responsibility after another, without providing additional funding. And now, based on the FY 2018 Budget Blueprint, we anticipate damaging cuts to NIST from the Trump Administration. I am pleased that we can agree on a bipartisan basis that NIST is an important agency that does excellent work across many areas with a relatively small budget. I just wish we could also agree that money does not grow on the trees at the NIST campus. We must be prepared to pay for what we value, or we will simply not accomplish the laudable goals of this legislation or any other activities we deem to be priorities. Mr. Chairman, I support H.R. 2105, and I thank the sponsors, including Mr. Webster, Mr. Lipinski, and Ms. Rosen, for their strong support for small businesses and NIST's important role in cybersecurity. However, I am concerned that the House bill contains an explicit unfunded mandate clause and that the Senate version is silent on funding. I hope that if we have the opportunity to negotiate a conference agreement, both bodies will see fit to provide NIST with adequate resources to fulfill the mandates in this legislation. With that I yield back.

Chairman SMITH. Thank you, Ms. Johnson, and the sponsor of the bill, the gentlemen from Florida, Mr. Webster, is recognized for a statement.

Mr. WEBSTER. Thank you, Mr. Chair, and thank you for scheduling this markup, especially timely since this is National Small Business Week.

America's small businesses are the backbone of our economy accounting for 54 percent of the American sales and 55 percent of American jobs. Unfortunately, small businesses are especially vulnerable and some reports note that it's 43 percent of cyber-attacks specifically target them.

H.R. 2105, the *National Institute of Standards and Technology Small Business Cybersecurity Act of 2017*, will help small businesses better address their cybersecurity risks to help them survive and thrive in the face of such adversary.

As an owner of a multi-generational, three-generational air conditioning and heating business, I understand firsthand the importance of equipping and empowering small businesses to tackle these challenges.

Just a few months ago, one of my associates came in to our office, and on the screen it says your computer has been hacked, your data is frozen, and pay us a certain amount of money, a pretty good bit of money, by 24 hours or we're going to destroy it. So that was a little bit of a concern, and—but I wasn't going to pay a ransom so I told our people let's see what we can do, so it ended up, we had a 2-day-old jump drive where we had backed up by chance all of the data that had been frozen, so we—our IT guy wiped the hard

disk, put the new data on, and then we re-upped it. It took us—we had to put the last 2 days of business on there, and it worked out. However, I think with the information that we could get from NIST and this bill if it were in place, we would have been better prepared to know what to do and how to do it so that the incident never happened to begin with.

So I know that there are thousands and thousands of businesses across the country who are seeing that every day. When they walk into their office, they have a ransom note, and many—I ended up talking to one person who had paid that ransom, and they were sad they did because about—they released their data, everything was fine, and 3 months later they did it again. So this is a thriving, awful business that's being used to be—that's perpetrated some pretty bad things against small businesses who are just trying to make a living.

So this bill, H.R. 2105, will provide small businesses in my district and across the State and across the country with the tools they need to actually circumvent these threats and challenges of the modern world, and I think a lot of times myself and my sons that run our business now tend to think, you know, this is only for big business, these are all the businesses that get highlighted on the news every night, that's the only ones that are at risk, and never really thought about the fact that we as a small business were at risk and knew nothing about these ransom notes that were being done.

So there's a similar bill in the Senate that's moving alone, *MAIN STREET Cybersecurity Act*. It's supported by the Small Business Administration, the National Restaurant Association, U.S. Chamber of Commerce, International Technique Group, and the Chamber of International Techni groups that have also come out in support of this H.R. 2105 and Senate 770, which passed the Senate's Commerce, Science and Transportation Committee in April by a voice vote.

I ask my colleagues to similarly support H.R. 2015 in a bipartisan manner so that we may prepare it for the House floor Action.

Thank you again, Mr. Chairman, for bringing up this bill and supporting this important bill today to help small businesses.

I yield back the rest of my time.

PREPARED STATEMENT OF MR. WEBSTER

Thank you Mr. Chairman for scheduling this markup today - it is especially timely as we celebrate National Small Business Week.

America's small businesses are the backbone of our economy accounting for 54 percent of all American sales and 55 percent of American jobs. Unfortunately, small businesses are especially vulnerable, with some reports noting that 43 percent of cyber attacks specifically target them.

H.R. 2105, the *National Institute of Standards and Technology (NIST) Small Business Cybersecurity Act of 2017*, will help small businesses better address their cybersecurity risks to help them survive - and thrive - in the face of such adversity.

As an owner of a multi-generational family air conditioning and heating business, I understand first-hand the importance of equipping and empowering small businesses to tackle challenges, so that they can grow and prosper. Thus, a couple weeks ago, I introduced H.R. 2105 with the support and cosponsorship of many of my colleagues on the Committee, including Chairman Smith, Chairwoman Comstock, and Ranking Member Lipinski.

H.R. 2105 will provide small businesses in my district, state and across the country with the tools they need to meet the threats and challenges of the modern world.

The bill:

- describes the vital role played by small businesses in the U.S. economy, the devastating impact of cyberattacks on a majority of small businesses, and the need to develop simplified resources to help them;
- directs the NIST Director - within a year of the Act's enactment - to disseminate clear and concise resources, which are defined as guidelines, tools, best practices, standards, methodologies, and other ways of providing information.
  - Dissemination would be in consultation with heads of other Federal agencies.
  - These resources - based on the NIST Framework for Improving Critical Infrastructure Cybersecurity - will help small businesses identify, assess, manage, and reduce their cybersecurity risks.

H.R. 2105 also:

- clarifies that use of the resources by small businesses is voluntary;
- directs the NIST Director, and heads of Federal agencies that so elect, to make the resources available on their government websites; and
- specifies that no new funds are authorized to carry out this Act.

This bill is very similar to Senate bill S.770, the *MAIN STREET Cybersecurity Act*, which is supported by the National Small Business Association, the National Restaurant Association, and the U.S. Chamber of Commerce - which also supports H.R. 2105. S.770 passed the Senate Commerce, Science, and Transportation Committee in April by a voice vote, and I ask my colleagues to similarly support H.R. 2105 in a bipartisan manner, so we may prepare it for House floor action.

Thank you again Mr. Chairman for bringing up and supporting this important bill today to help small businesses. I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Webster, and also, thank you for recounting your personal experience in regard to the subject at hand.

The gentlewoman from Nevada, Ms. Rosen, is recognized for a statement.

Ms. ROSEN. Thank you, Chairman Smith and Ranking Member Johnson for holding today's markup on the *NIST Small Business Cybersecurity Act*, a bill that I am very proud to cosponsor.

Last year, the majority of all targeted cyber-attacks were directed at small businesses. What's even scarier is that 60 percent of small businesses successfully attacked, they actually go out of business within 6 months.

Despite these facts, according to the National Cybersecurity Alliance Survey, nearly six out of ten small business, small-and medium-sized businesses, do not have a contingency plan outlining their procedures for responding and reporting data breach losses.

Many of these businesses do not have the resources to invest in a dedicated IT staff with the expertise to monitor and protect their computer systems. However, I believe with proper guidance on how to develop an information security program, small business can take the steps to protect their employees and their customers.

That's why I'm a proud cosponsor of *NIST Small Business Cybersecurity Act*. This bill requires the Director of National Institute of Standards and Technology, known as NIST, to provide small businesses with resources to identify and protect their digital assets from cybersecurity threats.

H.R. 2105 creates a simple, voluntary set of guidelines that are specifically tailored for use by small businesses. We all know small businesses are the backbone of our economy in southern Nevada. Las Vegas and the surrounding communities are home to hundreds of local businesses employing actually over 400,000 workers in our State.

Unfortunately, over the past several years, our casinos, our hotels and many of our other small businesses have suffered from cyber-attacks. This legislation that we're reviewing today would

greatly benefit small-and medium-sized businesses in my district, ensuring that they have the tools to protect themselves from cybersecurity threats.

I thank you, and I urge my colleagues to vote for H.R. 2105.

Chairman SMITH. Thank you, Ms. Rosen.

We will now proceed with amendments in the order listed on the roster. The first and only amendment offered by the gentlemen from California, Mr. McNerney, and I want to thank him for cosponsoring the bill, and the gentlemen is recognized.

Mr. MCNERNEY. Well, I thank the Chair, I thank Mr. Webster and Mr. Rosen, and I have an amendment that will——

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 2105 offered by Mr. McNerney of California, amendment #042.

Chairman SMITH. Without objection, the amendment as read, and the gentlemen is recognized to explain his amendment.

Mr. MCNERNEY. Thank you, Mr. Chairman.

I have a simple amendment, and it will improve the bill. It requires that the resources that NIST provides to small businesses include case studies of practical applications of cyber protection and recovery.

Small businesses are becoming a major target of cyber-attacks as we've heard. Small businesses are increasingly adopting information technology to store, process and communicate information. Although the proliferation of technology has provided small businesses with many benefits, it has also increased the attack surface for these cyber-attacks. Small businesses are generally very limited in resources and expertise. The owner of small businesses often are the only ones who handle cybersecurity-related matters along with a wide range of other responsibilities that Mr. Webster can attest to.

This is why it's critical that any information small businesses are provided with on how to better protect their companies against cyber-attacks be easy to understand and apply. Giving examples of how other businesses of similar size apply a particular cybersecurity guidance would be an important step toward achieving that goal.

Small businesses are the engine of economic growth and job creation in our Nation. In my district alone, there are over 31,000 small businesses. As Ms. Rosen mentioned, a recent study found that 60 percent of small businesses go out of business within 6 months of a cyber-attack. This suggests that if we want to see improved economic growth, we must help small businesses improve their cybersecurity.

As a cosponsor of 2105, I'm glad to see that we are considering legislation aimed at improving cybersecurity resources for small businesses. However, if we truly want to help businesses better understand how to utilize resources, it's important that these resources include case studies of practical applications. My amendment addresses this, and I urge my colleagues to support it, and I yield back.

Chairman SMITH. Thank you, Mr. McNerney.

And the gentleman from Florida, Mr. Webster, is recognized.

Mr. WEBSTER. Thank you, Mr. Chair.

I believe this amendment offered by the gentlemen from California, our colleague, is consistent with the desires of this bill, and I think it also would aid in protecting from cybersecurity attacks, and I support the amendment and I ask my colleagues to do the same.

Chairman SMITH. I'll recognize myself simply to say I think this amendment improves an already good bill, and I appreciate the gentlemen offering it.

Is there further discussion on the amendment?

If not, the question is on agreeing to the amendment offered by Mr. McNerney.

All in favor, say aye.

All opposed, no.

The ayes have it, and the amendment is agreed to.

If there are no further amendments, reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 2105 to the House as amended with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 2105 to the House as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the Motion to Reconsider is laid upon the table. H.R. 2105 is ordered reported to the House, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

If there is no further discussion, that completes our business of the day. Thank you all for being here, and we stand adjourned.

[Whereupon, at 10:21 a.m., the Committee was adjourned.]

Appendix:

H.R. 2105, Amendment Roster

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

I

115TH CONGRESS
1ST SESSION

H. R. 2105

To require the Director of the National Institute of Standards and Technology to disseminate guidance to help reduce small business cybersecurity risks, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 20, 2017

Mr. WEBSTER of Florida (for himself, Mr. LIPINSKI, Mr. SMITH of Texas, Mrs. COMSTOCK, Ms. ROSEN, Mr. HULTGREN, Mr. KNIGHT, Mr. LAHOOD, Mr. MARSHALL, and Mr. POSEY) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

---

A BILL

To require the Director of the National Institute of Standards and Technology to disseminate guidance to help reduce small business cybersecurity risks, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "NIST Small Business Cybersecurity Act of 2017".

SEC. 2. FINDINGS.

Congress makes the following findings:

(1) Small businesses play a vital role in the economy of the United States, accounting for 54 percent of all United States sales and 55 percent of jobs in the United States.

(2) Attacks targeting small and medium businesses account for a high percentage of cyberattacks in the United States. Sixty percent of small businesses that suffer a cyberattack are out of business within 6 months, according to the National Cyber Security Alliance.

(3) The Cybersecurity Enhancement Act of 2014 (15 U.S.C. 7421 et seq.) calls on the National Institute of Standards and Technology to facilitate and support a voluntary public-private partnership to reduce cybersecurity risks to critical infrastructure. Such a partnership continues to play a key role in improving the cyber resilience of the United States and making cyberspace safer.

(4) There is a need to develop simplified resources that are consistent with the partnership described in paragraph (3) that improves its use by small businesses.

SEC. 3. IMPROVING CYBERSECURITY OF SMALL BUSINESSES.

(a) DEFINITIONS.—In this section:

1 (1) DIRECTOR.—The term "Director" means
2 the Director of the National Institute of Standards
3 and Technology.
4 (2) RESOURCES.—The term "resources" means
5 guidelines, tools, best practices, standards, meth-
6 odologies, and other ways of providing information.
7 (3) SMALL BUSINESS CONCERN.—The term
8 "small business concern" has the meaning given
9 such term in section 3 of the Small Business Act
10 (15 U.S.C. 632).
11 (b) SMALL BUSINESS CYBERSECURITY.—Section
12 2(e)(1)(A) of the National Institute of Standards and
13 Technology Act (15 U.S.C. 272(e)(1)(A)) is amended—
14 (1) in clause (vii), by striking "and" at the end;
15 (2) by redesignating clause (viii) as clause (ix);
16 and
17 (3) by inserting after clause (vii) the following:
18 "(viii) consider small business con-
19 cerns (as defined in section 3 of the Small
20 Business Act (15 U.S.C. 632)); and".
21 (c) DISSEMINATION OF RESOURCES FOR SMALL
22 BUSINESSES.—
23 (1) IN GENERAL.—Not later than one year
24 after the date of the enactment of this Act, the Di-
25 rector, in carrying out section 2(e)(1)(A)(viii) of the

1 National Institute of Standards and Technology Act,
2 as added by subsection (b) of this Act, in consulta-
3 tion with the heads of other appropriate Federal
4 agencies, shall disseminate clear and concise re-
5 sources to help small business concerns identify, as-
6 sess, manage, and reduce their cybersecurity risks.
7 (2) REQUIREMENTS.—The Director shall en-
8 sure that the resources disseminated pursuant to
9 paragraph (1)—
10 (A) are generally applicable and usable by
11 a wide range of small business concerns;
12 (B) vary with the nature and size of the
13 implementing small business concern, and the
14 nature and sensitivity of the data collected or
15 stored on the information systems or devices of
16 the implementing small business concern;
17 (C) include elements, that promote aware-
18 ness of simple, basic controls, a workplace cy-
19 bersecurity culture, and third-party stakeholder
20 relationships, to assist small business concerns
21 in mitigating common cybersecurity risks;
22 (D) are technology-neutral and can be im-
23 plemented using technologies that are commer-
24 cial and off-the-shelf; and

1 (E) are based on international standards
2 to the extent possible, and are consistent with
3 the Stevenson-Wydler Technology Innovation
4 Act of 1980 (15 U.S.C. 3701 et seq.).
5 (3) NATIONAL CYBERSECURITY AWARENESS
6 AND EDUCATION PROGRAM.—The Director shall en-
7 sure that the resources disseminated under para-
8 graph (1) are consistent with the efforts of the Di-
9 rector under section 401 of the Cybersecurity En-
10 hancement Act of 2014 (15 U.S.C. 7451).
11 (4) SMALL BUSINESS DEVELOPMENT CENTER
12 CYBER STRATEGY.—In carrying out paragraph (1),
13 the Director, to the extent practicable, shall consider
14 any methods included in the Small Business Devel-
15 opment Center Cyber Strategy developed under sec-
16 tion 1841(a)(3)(B) of the National Defense Author-
17 ization Act for Fiscal Year 2017 (Public Law 114–
18 328).
19 (5) VOLUNTARY RESOURCES.—The use of the
20 resources disseminated under paragraph (1) shall be
21 considered voluntary.
22 (6) UPDATES.—The Director shall review and,
23 if necessary, update the resources disseminated
24 under paragraph (1) in accordance with the require-
25 ments under paragraph (2).

1 (7) PUBLIC AVAILABILITY.—The Director and
2 the head of each Federal agency that so elects shall
3 make prominently available on the respective agen-
4 cy's public Internet website information about the
5 resources and updates to the resources disseminated
6 under paragraph (1). The Director and the heads
7 shall each ensure that the information they respec-
8 tively make prominently available is consistent, clear,
9 and concise.

10 (d) OTHER FEDERAL CYBERSECURITY REQUIRE-
11 MENTS.—Nothing in this section may be construed to su-
12 persede, alter, or otherwise affect any cybersecurity re-
13 quirements applicable to Federal agencies.

14 (e) FUNDING.—This Act shall be carried out using
15 funds otherwise authorized to be appropriated or made
16 available to the National Institute of Standards and Tech-
17 nology.

○

AMENDMENT TO H.R. 2105

OFFERED BY MR. MCNERNEY OF CALIFORNIA

Page 4, after line 21, insert the following (and redesignate accordingly):

1 (D) include case studies of practical appli-
2 cation;

PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 2809, AMERICAN SPACE COMMERCE FREE ENTERPRISE ACT OF 2017

THURSDAY, JUNE 8, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 1:14 p.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recesses of the Committee at any time. Pursuant to Committee Rule II(e) and House Rule 112(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today we meet to consider H.R. 2809, the *American Space Commerce Free Enterprise Act of 2017*.

Pursuant to notice, I now call up H.R. 2809, the *American Space Commerce Free Enterprise Act of 2017*, and the clerk will report the bill.

The CLERK. H.R. 2809, a bill to amend Title 51, United States Code, to provide for the authorization and supervision of non-governmental space activities, and for other purposes.

Chairman SMITH. And without objection, the bill is considered as read and open for amendment at any point, and I'll recognize myself for an opening statement.

H.R. 2809 establishes a legal and policy environment intended to unleash American free enterprise and business, assure conformity with Outer Space Treaty obligations, and ensure that the United States will lead the world in commercial space activities throughout the 21st century.

This bill will promote investment and innovation, resulting in the creation of new high-paying and high-value jobs across the country. It will increase American competitiveness and attract companies, talent, and money that otherwise would have gone to other countries. It ensures America and its work force will benefit from the new space economy.

The problem this bill seeks to address is the kind of legal uncertainty that arose after Bigelow Aerospace and Moon Express sought payload approval from the Department of Transportation for its non-traditional space activities. The payload review and ap-

proval process is meant to prevent launches of payloads that jeopardize American interests and safety. It is not designed to satisfy the State Department's concerns about complying with Article VI of the Outer Space Treaty. Under the Treaty, signatories are to authorize and provide continuing supervision of their country's non-governmental space activities. In the case of Bigelow and Moon Express, the executive branch stated that it would not be able to assure the public that new and innovative space activities would be approved for launch in the future.

The goal of this bill is not to regulate space broadly or to address all of the possible future challenges that the private sector will face in outer space. Doing so would be premature and likely to stifle innovation and investment. Instead, the bill takes a commonsense approach by establishing a legal foundation upon which U.S. industry can flourish. It establishes a transparent U.S. authorization and supervision certification process for non-governmental space activities that provides regulatory certainty for the U.S. commercial space sector. It assures compliance with United States Outer Space treaty obligations and addresses national security concerns in the least burdensome manner possible.

The bill includes a provision that consolidates at the Department of Commerce's Office of Space Commerce existing regulatory authority spread across three different Federal agencies now. America gets a one-stop shop for authorizing activities that will take place in outer space. It also streamlines remote sensing regulations to ensure that United States national security is addressed not by holding America's space industry back, but by empowering it to lead the world.

Absent this bill, American industry would continue to face legal uncertainty. Innovation would be subject to a burdensome and open-ended regulatory process, with no assurance of Outer Space Treaty compliance.

An initial draft of the legislation before us now was publicly presented over a month ago for any and all input. We have spent the past month meeting, listening, and considering specific, detailed comments from outside stakeholders, interested Federal agencies, the Administration, and our Committee colleagues including those from the Minority side of this Committee. Many if not most of their recommendations and requested changes have been included.

Over the past few days, we have received letters and statements of support for the bill from the following entities: AgileAero, Inc. Atmospheric and Environmental Research, Atmospheric & Space Technology Research, Axiom Space, Bigelow Aerospace, Blue Origin Carmel Research Center, the Commercial Spaceflight Federation, which consists of hundreds of members, Digital Globe, Inc. GeoOptics, Moon Express, Panasonic, Planet Labs, Inc., Satellite Industry Association, Space Frontier Foundation, Spaceport Strategies, Spire Global, Space Environment Technologies, Space Florida, SpaceX, Students for the Exploration and Development of Space, and TechFreedom. Without objection, the letters we have received will be included in the record. I want to thank these groups for their support of the legislation.

From:

Agile Aero, Inc.
602 North Baird
Suite 200
Midland, TX 79701
June 7, 2017

AgileAero

To:

Rep. Lamar Smith

Chairman Smith,

Quietly, for many years, a debate has taken place in government and commercial space policy circles about the proper legal structure for handling actions by U.S. entities that take place far from Earth. The American Space Commerce Free Enterprise Act of 2017 brilliantly resolves some of the contradictions inherent in more traditional models and proposes a new and, in my opinion, very effective legal structure for future activities.

We currently have a "permission first" approach for launch and reentry activities, driven by concerns over the potential risks to the uninvolved public from rocket launches. Today, no Federal agency has jurisdiction over the purely in-space activities for future activities such as private space stations, satellite servicing and refueling, or private missions to the Moon. And yet, both simple prudence and the treaty obligations of the United States require us to ensure that the peaceful activities of U.S. entities do not interfere with the peaceful activities of other nations, so some Federal scrutiny is called for. A more traditional structure of seeking permission for each new type of activity has the inherent problem that when something has never been done, a host of questions comes up which take a long time to answer.

The bill solves that problem by placing the burden of decision on the Federal review rather than on private actors, some of whom will be small innovative companies – by a very American approach to the problem. U.S. citizens are the primary authority in the United States, the Federal government has only the powers delegated to it. U.S. citizens will be the primary actors in space, under this regime; they will notify the Federal government of their action far enough for the Federal government to confirm that there are no treaty violations or national security concerns, and then, unless the Federal government moves to stop the action, it is permitted. This is an excellent model for maintaining U.S. national security and foreign policy responsibilities while encouraging a wide range of innovative commercial activities in space.

The concept of a central registry also provides a non-regulatory mechanism by which, over time, U.S. entities can cooperate with each other and with non U.S. entities to coordinate their activities and areas of operation.

No one today can foresee all of the businesses and companies which might flourish under such a regime, and no regulatory agency could possibly have suitable, clear regulatory guidance for all of those things which are unforeseeable. Together, under this bills structure, we can all discover new ways for space assets and resources to contribute to the economy of the Earth.

Jeff Greason

CEO, Agile Aero

Atmospheric and
Environmental Research

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June 7, 2017

Committee on Space, Science and Technology
US House of Representatives
Washington, DC 20515

Dear Chairman Smith,

Thank you for your efforts on the American Space Commerce Free Enterprise Act of 2017 in the Committee on Science, Space and Technology. AER is a member of the American Commercial Space Weather Association (ACSWA) and supports the bi-partisan efforts developing this bill. We support efforts to bring it before the House of Representatives as soon as possible.

The Act has a number of important provisions, including simplifying and strengthening the outdated space-based remote sensing regulatory system. The Act will also enhance U.S. compliance with international obligations, improve national security, and eliminate cumbersome regulatory barriers facing new and innovative space technology companies.

We support the creation of a single authority for registration of nongovernmental space activities located at the Department of Commerce Office of Space Commerce. We also support maintaining our international obligations to the Outer Space Treaty and recognizing any safety risks posed to our existing federal space systems.

Atmospheric and Environmental Research (AER) provides science-based solutions to global environmental challenges. AER's internationally renowned scientists and software engineers collaborate to transform state-of-the-art predictive science and analytical tools into practical systems that address both civilian government and defense needs for geophysical understanding, computer simulation, and forecasting. Areas of expertise comprise atmospheric and environmental science, satellite remote sensing, oceanography, meteorology, space science, climate change, and software engineering. A unit of the Verisk Climate division at Verisk Analytics (Nasdaq:VRSK), AER was established in 1977 and is headquartered in Lexington, Mass.

I thank you and the co-sponsors for your leadership on this important issue.

Sincerely,

Guy P. Seeley, Ph.D.
President

CC: US Rep. Brian Babin and US Rep. Jim Bridenstine

ATMOSPHERIC & SPACE TECHNOLOGY
RESEARCH ASSOCIATES, LLC

5777 CENTRAL AVENUE • • BOULDER, COLORADO, USA 80301 • • 210-834-3475

EIN: 20-2946717 DUNS# 60-1975803

Date: June 7, 2017

Committee on Space, Science and Technology
US House of Representatives
Washington, DC 20515

Dear Chairman Smith,

Thank you for marking up the American Space Commerce Free Enterprise Act of 2017 in the Committee on Science, Space and Technology. Atmospheric & Space Technology Research Associates (ASTRA) LLC is in strong support of the bi-partisan efforts in the development of this bill and we support efforts to bring it before the House of Representatives as soon as possible.

The Act has a number of important provisions, most important is that the proposed legislation will simplify and strengthen the outdated space-based remote sensing regulatory system. Equally important is that the Act will enhance U.S. compliance with international obligations, will serve to improve national security and eliminates cumbersome regulatory barriers facing new and innovative space technology companies.

We support the creation of a single authority for registration of nongovernmental space activities located at the Department of Commerce Office of Space Commerce; as well as, maintaining our international obligations to the Outer Space Treaty and recognizing any safety risks posed to our existing federal space systems.

ASTRA is one of the leading U.S. commercial organizations providing space weather services and products. We have developed a new model of the upper atmosphere that is being transitioned to the USAF Joint Space Operations Center (JSpOC) at Vandenberg AFB. We have developed and flown a number of Cubesats, with several others currently under construction for NASA, NSF and the DoD. We have also developed and deployed an instrument for monitoring conditions in the ionosphere that can degrade and disrupt GPS signals and UHF satellite communications for both the DoD and commercial providers. Two of these systems are about to be deployed on NOAA buoys in the Pacific, and we have an array of systems distributed across Alaska.

ASTRA is a Small Business, and also a proud member of the American Commercial Space Weather Association (ACSWA), an association dedicated to improving America's competitive edge in space. I thank you and the co-sponsors for your leadership on this important issue.

Sincerely,

Geoffrey Crowley

Dr. Geoff Crowley, Ph.D.
President & Chief Scientist

CC: U.S. Rep. Brian Babin and U.S. Rep. Jim Bridenstine

AXIOM SPACE

17155 Feathercraft Lane
Webster, Texas 77598
tel. 281.823.9717

June 7, 2017

The Honorable Lamar Smith
Chairman
House Committee on Science, Space and Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member
House Committee on Science, Space and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

Axiom Space, LLC, is a company new to the arena of commercial space, but our team is anything but new to the world of human spaceflight. With our long history of keeping people healthy, happy and productive in space, our aim is to develop the world's first commercial space station, and to make living and working in space commonplace as a means to deeper space exploration.

We have been following with interest the development of the American Space Commerce Free Enterprise Act of 2017 in the Space Subcommittee. As a company who envisions a purely commercial business model, requesting no government funding and no guarantee of a government anchor tenant, we rely heavily on outside investment. Investors are, in turn, very focused on understanding risk, which includes knowing the impact of government-imposed regulation. For this reason, Axiom Space is fully supportive of the intent of the Act – to **maximize certainty while minimizing the regulatory burden** placed on new and innovative space companies. Since our expertise is in human spaceflight and not in regulatory policy, we cannot offer a path to achieve this goal, but simply voice our strong support of your intent to achieve it.

Please don't hesitate to contact me if you'd like to hear more about Axiom Space.

Sincerely,

Michael Suffredini
President and CEO

Hon. Lamar Smith
Chairman
2409 Rayburn
House Office
Building
Washington, DC
20515

Hon. Eddie
Bernice Johnson
Ranking Member
2468 Rayburn
House Office
Building
Washington, DC
20515

Hon. Brian Babin
Chairman
316 Cannon
House Office
Building
Washington, DC
20515

Hon. Ami Bera
Ranking Member
1431 Longworth
House Office
Building
Washington, DC
20515

June 8, 2017

Dear Chairman Smith, Ranking Member Johnson, Chairman Babin, and Ranking Member Bera:

I am writing to the Committee on Science, Space, and Technology today in strong support of the American Space Commerce Free Enterprise Act (ASCFEA) as introduced by Chairman Smith, Chairman Babin, Rep. Bridenstine, Rep. Ed Perlmutter, Rep. Rohrabacher, Rep. Hultgren, Rep. Weber, Rep. Higgins, and Rep. Kilmer. Bigelow Aerospace strongly endorses the core principles of the ASCFEA to ensure a regulatory "light touch" approach that enables technological innovation and also helps to promote safe operations in space under an authorization schema through the registration of space objects. I applaud the committee for working tirelessly on a bipartisan approach that upholds and enhances American leadership in space as well as lays the foundation for commercial space activities to grow and flourish. Bigelow Aerospace endorses the effort of the Committee to report the bill out favorably to the House of Representatives for further consideration.

The ASCFEA addresses two main issues that Bigelow Aerospace believes needs resolution as soon as possible to ensure future coordination of commercial activities thereby promoting safety in space, to avoid regulatory uncertainty impeding capital and market formation, and to provide for timely approvals and appealable denials from the US Government for commercial, "non-traditional" space activities. First, the ASCFEA seeks to identify a Federal agency to handle the authorization schema for space objects. Second, the bill seeks to reorganize the interagency process relating to how the US Government shall review the proposed activities of space objects subject to an internal US registry system. However, overall, the ASCFEA provides much needed regulatory certainty to the commercial space industry as we bring online innovative and critical technologies to bring down the cost of access to space.

With respect to the identification of a Federal agency to handle the authorization schema for space objects, I understand that there are concerns regarding whether the Federal Aviation Administration's Office of Commercial Space Transportation (FAA/AST) or the Department of Commerce's Office of Space Commerce (DOC/OSC) should hold that authority. Bigelow Aerospace believes that it is prudent to seek a clear demarcation between launch and reentry from all other commercial, "non-traditional" space activities that do not have a transportation function. Given the projected cadence of space activities within the next five years, it is critical that the Congress make a decision that does not burden the ability of commercial space companies to conduct operations in space. Therefore, Bigelow Aerospace believes that the

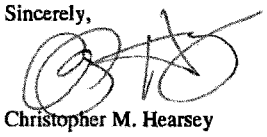
DOC/OSC should have the authority to maintain an authorization for space objects because the ASCFEA would provide for closer political responsiveness from the Secretary of Commerce and it would properly treat expandable habitat systems as destinations and not transportation.

Moreover, no matter which Federal agency the Congress chooses to place the new authorities expressed in the ASCFEA within, Bigelow Aerospace believes that it is vitally important that the registration of space objects that form the basis of any authorization regime should be public enough to ensure that some notice is given to the operations of commercial activities in space. It is vital for safe operations in space that we maintain a timely, public registry of space objects that will help incentivize market formation for insurance and secured transactions, among other markets, establish duties of care in operations, and lay the foundation for de-conflicting operations between two or more space objects. Any Federal agency with authority over the authorization of space objects must be able to handle a timely and updatable public registry of space objects.

With respect to the reorganization of the interagency process to authorize and supervise commercial space activities, the ASCFEA contains the basic principles that Bigelow Aerospace, et al., previously articulated in a jointly signed letter to the Committee on March 8, 2017. In that letter, Bigelow Aerospace, Space Systems Loral, Deep Space Industries, and Space Florida expressed to the Committee that any Federal agency that has the authority to authorize and supervise commercial space activities should have a process that presumes approval, establishes a transparent and responsive process for approval, has defined deadlines, and provides a commercial entity with a clear understanding and ability to appeal as well as address denials or conditions when seeking a launch license. Moreover, these criteria are a product of concerns raised and discussed between FAA/AST and the Department of State with Bigelow Aerospace as a consequence of our payload review determination in 2014. Through that process, FAA/AST and the Department of State (DOS) worked together to identify the salient issues relating to the authorization and supervision of commercial, "non-traditional" space activities. We applaud the efforts of FAA/AST Associate Administrator George Neild and DOS Director of the Office of Space and Advanced Technology, Kenneth Hodgkins, as well as former DOS Attorney-Advisor Brian Israel for their work to find a path forward to approving commercial, "non-traditional" space activities. I am elated that the Committee has found a possible solution to the concerns raised about the interagency process for commercial, "non-traditional" space activities. I thank the Committee for being receptive to the concerns raised by Bigelow Aerospace and others regarding the interagency process.

Bigelow Aerospace is greatly appreciative to the Committee Members and staff for dedicating their time and energy to drafting a bill that helps enable and support commercial markets for spacecraft like expandable habitat systems. We thank the Committee for considering the principles we laid out and look forward to working with Members and staff as the bill progresses through the legislative process.

Sincerely,



Christopher M. Hearsey

Director of Legislative Affairs
Bigelow Aerospace, LLC

CARMEL RESEARCH CENTER

DR. DEVRIE S. INTRILIGATOR, DIRECTOR
CARMEL RESEARCH CENTER | SPACE PLASMA LABORATORY
P. O. BOX 1732, SANTA MONICA, CA 90406
TEL: (310)829-5275 |FAX:(310)453-2983 |DEVRIEI@AOL.COM

Committee on Space, Science and Technology June 7, 2017
US House of Representatives
Washington, DC 20515

Dear Chairman Smith,

Thank you for marking up the American Space Commerce Free Enterprise Act of 2017 in the Committee on Science, Space and Technology. Carmel Research Center, Inc. is in strong support of the bi-partisan efforts in the development of this bill and we support efforts to bring it before the House of Representatives as soon as possible.

The Act has a number of important provisions, most important is that the proposed legislation will simplify and strengthen the outdated space-based remote sensing regulatory system. Equally important is that the Act will enhance U.S. compliance with international obligations, will serve to improve national security and eliminates cumbersome regulatory barriers facing new and innovative space technology companies.

We support the creation of a single authority for registration of nongovernmental space activities located at the Department of Commerce Office of Space Commerce; as well as, maintaining our international obligations to the Outer Space Treaty and recognizing any safety risks posed to our existing federal space systems.

Carmel Research Center, Inc. is an important business in space weather. We have worked in many of the basic space weather efforts including instrument development and implementation, and many diverse areas of theoretical and physics-based methods in predicting space weather events at Earth and throughout the solar system.

Carmel Research Center, Inc. is also a member of the American Commercial Space Weather Association (ACSWA), which is dedicated to improving the USA's efforts in space research, space weather, and international competiveness.

We thank you and the co-sponsors for your leadership on this important issue.

Sincerely,

Devrie S Intriligator

Dr. Devrie S. Intriligator
Director, Space Plasma Laboratory
Carmel Research Center, Inc.

CC: US Rep. Brian Babin and US Rep. Jim Bridenstine

201 N. Orange Grove Blvd., Suite 503
Pasadena, CA 91103

June 7, 2017

House Committee on Science, Space and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith,

Thank you for marking up the American Space Commerce Free Enterprise Act of 2017 in the Committee on Science, Space and Technology. GeoOptics strongly supports the bi-partisan efforts to develop this bill as well as efforts to mark it up in the House Science Committee and bring it before the House of Representatives.

The Act has a number of important provisions, including the establishment of a single authority for registration of nongovernmental space activities located at the Department of Commerce Office of Space Commerce; as well as, maintaining our international obligations to the Outer Space Treaty and recognizing any safety risks posed to our existing federal space systems. We strongly support this effort to streamline regulatory burdens and promote the commercial use of space.

Under the proposed legislation, the space-based remote sensing regulatory system would undergo regularization and simplification, which is of particular importance to companies like ours that plan to develop new commercial remote sensing capabilities and seek a predictable regulatory regime for such activities. The Act would also ensure U.S. compliance with international obligations, promote evidence-based regulation, improve national security and eliminate cumbersome regulatory barriers facing new and innovative space technology companies.

GeoOptics will soon launch the first of its constellation of small satellites that will provide advanced, affordable and reliable weather and environmental data to the Federal government and other customers. This data will help private and public decision-makers make well-informed decisions about natural resources around the world.

I thank you and the co-sponsors of this legislation, Space Subcommittee Chairman Brian Babin and Rep. Jim Bridenstine for your leadership on this important issue.

Sincerely,

Conrad C. Lautenbacher, Jr.
VADM USN (ret.) and CEO, GeoOptics

CC: Rep. Brian Babin, Rep. Jim Bridenstine

MAXAR
TECHNOLOGIES

April 23, 2018

Honorable Kevin McCarthy
Majority Leader
United States House of Representatives
H-107 Capitol Building
Washington, D.C. 20515

Honorable Steny Hoyer
Democratic Whip
United States House of Representatives
1705 Longworth House Office Building
Washington, D.C. 20515-6537

The Honorable Lamar Smith
House Committee on Science, Space, and Technology
2409 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
House Committee on Science, Space, and Technology
2468 Rayburn House Office Building
Washington, DC 20515

Dear Leaders-

As you may know, late last year, Maxar Technologies was formed. Maxar is the combination of Space Systems Loral (SSL), MDA, DigitalGlobe and Radiant Solutions. The combination has enabled leadership in satellite communications (building and operating), ground infrastructure, Earth observation, advanced analytics, insights from machine learning, next-generation propulsion, space robotics, and on-orbit servicing. Having just hit our six month mark as this new company, we are excited for the future.

While our excitement grows for possibilities and advancements in space, we continue to be concerned about the regulatory restrictions the industry faces. This is why the passage of HR2809-The American Space Commerce Free Enterprise Act-is so critical. For too long, the remote sensing industry, in particular, has operated under outdated laws and regulations that are hampering international competitiveness. This bill will provide necessary updates that will help keep US industry an international leader and provide the transparency, timelines and predictability needed for technology advancements and investment. Further, it moves to establish a new office within the Department of Commerce for space activities. We believe this move will elevate space commerce appropriately within this department and commensurate with national interests.

We applaud the Committee on Science, Space and Technology for their continued leadership on this issue and look forward to its passage.

Sincerely,

Marcy Steinke
Senior Vice President
Government Relations & Public Policy
Maxar Technologies

MOON EXPRESS

June 8th, 2017

The Honorable Lamar Smith
Chair, House Committee on Science,
Space & Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member, House Committee on
Science, Space & Technology
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson:

I am writing to express my endorsement and support of the American Space Commerce Free Enterprise Act (ASCFEA), as introduced by Chairman Smith, Chairman Babin, and Representative Bridenstine, and the markup by the Committee on Science, Space and Technology.

As the first U.S. company to request and receive U.S. governmental 'mission approval' to send a private robotic spacecraft beyond traditional Earth orbit and to the Moon, we can attest to the need for certainty of process within a framework of minimal regulatory burden. Of particular importance to us and our plans for continuing commercial lunar operations, is the ASCFEA's goal to formally address the U.S. government's obligations under Article VI of the Outer Space Treaty to authorize and supervise "non-traditional" commercial space activities like ours. This legislation creates a clear, objective, transparent, timely and appealable process for American companies like Moon Express to pursue innovative commercial space activities beyond traditional Earth orbit.

We are particularly pleased with the ASCFEA's creation of a new Private Space Activity Advisory Committee that will include private sector representation to help the Secretary of Commerce and a new Assistant Secretary for Commercial Space carry out their responsibilities under this legislation.

The legislation supports a process that focuses and streamlines the regulatory framework, limits the government's role to a light touch, promotes American innovation and investment, and satisfies our international obligations. The premise of "presumed authorization within predefined boundary conditions" is the right approach to non-traditional commercial space activities beyond Earth orbit.

The binding timeframe for review of a registration of a non-traditional commercial space mission is also vital to a workable "presumed authorization" regulatory framework.

This legislation charts a clear path for the freedom of U.S. space enterprise to flourish, carrying forward strong foundational principles of the United States into the frontiers of space. I recognize and appreciate the Committee's continued bipartisan support for America's commercial space industry, and endorse it being reported favorably to the House of Representatives for further consideration.

I am thankful to you, Chairman Babin, Mr. Bridenstine, and all your staff who have worked on developing this important legislation. I am particularly appreciative of the inclusive and transparent process that has welcomed and considered feedback from commercial space stakeholders on the key aspects of the bill.

Thank you for your continuing leadership and support for the U.S. commercial space industry. I wish you a successful markup today.

MOON EXPRESS

Sincerely,

Dr. Robert (Bob) Richards
Founder, President & CEO

CC:
The Honorable Kevin McCarthy
The Honorable Brian Babin
The Honorable Jim Bridenstine
The Honorable Ami Bera
The Honorable Ed Perlmutter
The Honorable Derek Kilmer

Panasonic

June 7, 2017

Committee on Space, Science and Technology
US House of Representatives
Washington, DC 20515

Dear Chairman Smith,

Thank you for marking up the American Space Commerce Free Enterprise Act of 2017 in the Committee on Science, Space and Technology. Panasonic is in strong support of the bi-partisan efforts in the development of this bill, and we support efforts to bring it before the House of Representatives as soon as possible.

The Act has a number of important provisions, most important is that the proposed legislation will simplify and strengthen the outdated space-based remote sensing regulatory system.

Equally important is that the Act will enhance U.S. compliance with international obligations, will serve to improve national security and eliminates cumbersome regulatory barriers facing new and innovative space technology companies.

We support the creation of a single authority for registration of nongovernmental space activities located at the Department of Commerce Office of Space Commerce; as well as, maintaining our international obligations to the Outer Space Treaty and recognizing any safety risks posed to our existing federal space systems.

Panasonic Avionics Corporation, a U.S. corporation, is a subsidiary of Panasonic Corporation of North America, the principal North American subsidiary of Panasonic Corporation. Panasonic Avionics Corporation utilizes space-based Ku-band high-throughput satellites to provide connectivity and communication solutions to the maritime and aviation industries.

I thank you and the co-sponsors for your leadership on this important issue.

Sincerely,

Neil Jacobs

CC: US Rep. Brian Babin and US Rep. Jim Bridenstine

Panasonic Avionics Corporation 3303 Monte Villa Parkway, Bothell, WA 98012

panasonic.aero

PLANETARY RESOURCES

6742 185th Ave NE
Redmond, WA 98052

425-336-2448
425-336-2439

9 June 2017

The Honorable Lamar Smith
Chair, House Committee on Science,
Space & Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member, House Committee on
Science, Space & Technology
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

Planetary Resources is in strong support of the American Space Commerce Free Enterprise Act (ASCFEA), H.R. 2809. This legislation continues the leadership, vision, and bipartisanship of the Committee in support of America's commercial space industry. Building upon the Commercial Space Launch and Competitiveness Act (CSLCA), P.L.114-90, this legislation will enable our business to innovate and pioneer new economic opportunities in outer space in accordance with international law.

Specifically, we are pleased to see a clear, transparent, and responsive process for Planetary Resources to plan and execute its mission of asteroid prospecting and mining. This process creates the mechanism for the United States to authorize and supervise the activities of its citizens in space, in accordance with Article VI of the 1967 Outer Space Treaty.

This legislation is highly beneficial to the U.S. commercial space industry. Planetary Resources would like to highlight the following areas that we believe would increase the effectiveness of the legislation:

- With regard to §80304, we recommend amending the section to require concurrence of the Secretary of State or eliminating it altogether. Planetary Resources believes the State Department retains experience and expertise that is critical for informing the development of the least restrictive and most beneficial process to meet our international obligations and supporting industry.
- With regard to §2(b)(1), we recommend striking the phrase "without conditions or limitations" because it is internally inconsistent. The subsections in the bill that follow provide conditions for the use of space by U.S. citizens and entities.
- With regard to §80309, we recommend moving this language to §2(a), Findings, and changing the text to read:
  - *That "global commons" is not a legal concept and neither gives rise to nor affects any of the United States international obligations.*

We are grateful for the persistent leadership and support this Committee provides to the commercial space industry. Planetary Resources looks forward to working with the Committee to ensure a competitive, stable, and forward-looking legal framework that enhances this market, meets our international obligations and continues the United States' leadership in commercial space activities.

Respectfully,

Peter Marquez
Vice President for Global Engagement
Planetary Resources

PLANETARY RESOURCES

CC:

The Honorable Kevin McCarthy
The Honorable Brian Babin
The Honorable Ami Bera
The Honorable Jim Bridenstine
The Honorable Clay Higgins
The Honorable Randy Hultgren
The Honorable Derek Kilmer
The Honorable Ed Perlmutter
The Honorable Dana Rohrabacher
The Honorable Randy Weber

June 7, 2017

The Honorable Lamar Smith
Chairman
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Edie Bernice Johnson
Ranking Member
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Brian Babin
Chairman
Subcommittee on Space
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Ami Bera
Ranking Member
Subcommittee on Space
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Re: American Space Commerce Free Enterprise Act of 2017

Dear Chairman Smith, Ranking Member Johnson, Chairman Babin and Ranking Member Bera,

The Satellite Industry Association[1] (SIA) respectfully requests this letter be entered into the record for the full committee mark-up of the American Space Commerce Free Enterprise Act of 2017 on June 8, 2017 with relevance to Chapter 802 – Permitting of Space-Based Remote Sensing Systems[2].

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[1] SIA Executive Members include: The Boeing Company; AT&T Services, Inc.; EchoStar Corporation; Intelsat S.A.; Iridium Communications Inc.; Kratos Defense & Security Solutions; Ligado Networks; Lockheed Martin Corporation; Northrop Grumman Corporation; OneWeb; SES Americom, Inc.; Space Exploration Technologies Corp.; SSL; and ViaSat, Inc. SIA Associate Members include: ABS US Corp.; Artel, LLC; Blue Origin; DataPath, Inc; DigitalGlobe Inc.; DRS Technologies, Inc.; Eutelsat America Corp.; Global Eagle Entertainment; Glowlink Communications Technology, Inc.; Hughes; Inmarsat, Inc.; Kymeta Corporation; L-3 Electron Technologies, Inc.; O3b Limited; Panasonic Avionics Corporation; Planet; Semper Fortis Solutions; Spire Global Inc.; TeleCommunication Systems, Inc.; Telesat Canada; TrustComm, Inc.; Ultisat, Inc.; and XTAR, LLC.

[2] This letter reflects comments of SIA to section 802 only. SIA and its members may have additional views on the legislation to be provided separately. SIA also recognizes and agrees

The United States is clearly a leader in commercial satellite remote sensing in terms of technology, innovation, bringing new capabilities to market, and leveraging remote sensing data to solve challenging problems. However, regulating it requires a fundamental shift in approach as commercial remote sensing platforms evolve into digital information services in a more competitive international landscape. This shift in regulation must ensure greater predictability, transparency, and accountability for the U.S. commercial remote sensing industry to thrive.

On May 12th, 2017, SIA sent a letter to Chairman Babin and Ranking Member Bera thanking them for their support of the satellite industry and a productive round table discussion on March 15th, 2017 that addressed the needs, challenges, and opportunities for reforming the U.S. commercial remote sensing regulatory regime. SIA outlined further specifics that would help to achieve this fundamental shift in regulating the industry and we are pleased to see many of those elements incorporated into the draft legislation.

In particular, we support much of the draft legislation addressing commercial remote sensing, and its general goals:

- Recognizing that the commercial remote sensing industry brings benefit to security and economic growth;
- Clarifying that technology not capable of imaging the earth is not subject to licensing requirements;
- Reorganizing the commercial remote sensing regulatory responsibilities within the Department of Commerce to a level commensurate with the importance and potential of this sector for the United States;
- Introducing regulatory transparency for stakeholders;
- Eliminating the possibility of de facto vetoes of a pending application;
- Giving clear authority to Department of Commerce to consult, as necessary, with other Departments and Agencies;
- Establishing a decreased review time with a presumption of approval for license applications to be more responsive to business opportunities, and, further, assures that the Department of Commerce can be held accountable to congressionally-established review periods for license applications; and
- Prohibiting the Department of Commerce from instituting retroactive changes to operational licenses that have immediate and irreversibly negative impact on

---

with the exemption of this legislation of commercial space stations licensed by the Federal Communications Commission.

established, and/or long-standing technical and business operations of licensees, especially when or if other methods are available to the United States government to achieve the same ends to protect national security.

SIA strongly supports these goals addressed in the draft legislation; we applaud the sponsors of this bill and the Committee's leadership for their efforts to date to advance reform of the commercial remote sensing regulatory regime. SIA believes that introducing greater transparency and discipline into the U.S. Government's regulatory review processes will ultimately encourage industry growth and bring a multitude of benefits to the U.S. economy and security.

Sincerely,

/s/
Tom Stroup
President
Satellite Industry Association

Satellite Industry Association – 1200 18th Street, N.W., Suite 1001, Washington, D.C. 20036
Tel: +1 202 503-1560 Email: info@sia.org SIA Website: http://www.sia.org

Spaceport Strategies
LLC

June 7, 2017

The Honorable Lamar Smith
Chairman
Committee on Science, Space, and Technology
United States House of Representatives
2409 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member
Committee on Science, Space, and Technology
United States House of Representatives
2468 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson:

I am writing to express my strong support of the Committee on Science, Space and Technology's markup of the American Space Commerce Free Enterprise Act (ASCFEA), as introduced by Chairman Smith, Chairman Babin, and Representative Bridenstine.

This legislation makes clear that the Committee has given great thought to a long view of how to best enable American industry and entrepreneurs to pursue space commerce activities aimed at exploring, developing, and utilizing space resources.

It is especially encouraging for its "light touch" approach, and the explicit limitations on U.S. Government actions that would delay or inhibit U.S. companies from pursuing space commerce activities. Having been engaged in both the Government and private industry commercial space policy deliberations over the past 30 years, I believe the Committee's policy and regulatory approach is coming at just the right time to help ensure our nation has the most competitive posture to opening the space frontier for economic benefit.

There continues to be much discussion within the space community about many aspects of how to best organize Government functions to keep pace with rapidly evolving private sector capabilities and innovation. But the Committee is correctly focusing on what is needed now to best ensure non-traditional space activities are able to flourish, and is to be commended for moving forward with this initiative to provide a predictable investment and operations environment for exciting new commercial space ventures which promise to reach to the Moon and beyond.

Designation of the Secretary of Commerce and an Assistant Secretary-level Office of Space Commerce is a reasonable and effective solution to addressing the administrative requirements for international treaty compliance without intrusive, burdensome impacts on the industry. It is important that there be a bright line of responsibilities between the U.S. Department of Transportation – whose role is to promote, foster, and enable commercial space transportation – and an expanded role for Department of Commerce to promote, foster, and enable space commerce in utilizing in-space resources by administering the requisite U.S. Government registration of non-governmental activities in space to pursue that utilization while ensuring compliance with treaty obligations.

I formed my consulting company after many years in both Government and industry, a career still dedicated to advancing both U.S. commercial space transportation capabilities and commercial uses of space resources.

Spaceport Strategies LLC P.O. Box 10052, Titusville, FL 32783

Back in the middle 1980s, the nation's commercial space policy was just beginning to take shape, and then, as now, there was considerable discussion about what agencies should have which roles in promoting, encouraging, fostering, and, when necessary, regulating the activities of private entities and commercial providers. The Department of Transportation, Department of Commerce, and NASA all had a role to play, and as you've recognized, they still do.

The commercial space industry – both its transportation component and its resource utilization component – are no longer in infancy. I commend the Committee leadership, and its staff, for engaging the commercial space industry and considering the many inputs and recommendations you have received as you move into markup.

Thanks for your hard work, your thoughtful perspective on how U.S. leadership and interests in space can be best achieved, and for the courage to take bold steps to ensure our nation will be second to none in pursuing the exploration of space and the utilization of its resources to improve lives on earth while expanding humanity outward.

Sincerely,

Jim Ball

Jim Ball, President
Spaceport Strategies LLC

SPACE ENVIRONMENT TECHNOLOGIES
Space Research *Space Operations* *Space Standards*

June 7, 2017

Committee on Space, Science and Technology
US House of Representatives
Washington, DC 20515

Dear Chairman Smith,

Thank you for marking up the American Space Commerce Free Enterprise Act of 2017 in the Committee on Science, Space and Technology. Space Environment Technologies (SET) is in strong support of the bi-partisan efforts in the development of this bill and we support efforts to bring it before the House of Representatives as soon as possible.

The Act has a number of important provisions, most important is that the proposed legislation will simplify and strengthen the outdated space-based remote sensing regulatory system. Equally important is that the Act will enhance U.S. compliance with international obligations, will serve to improve national security and eliminates cumbersome regulatory barriers facing new and innovative space technology companies.

We support the creation of a single authority for registration of nongovernmental space activities located at the Department of Commerce Office of Space Commerce; as well as, maintaining our international obligations to the Outer Space Treaty and recognizing any safety risks posed to our existing federal space systems.

Space Environment Technologies is the leading U.S. commercial organization providing space weather services and products. We operationally support the USAF Joint Space Operations Center (JSpOC) at Vandenberg AFB with hourly forecasts of solar and geomagnetic indices for updating the NORAD satellite catalog for all space objects. SET has also developed and is deploying the first capability for monitoring, in real-time, the radiation environment at aircraft altitudes to manage the risk form large solar particle events and their associated hazards to crew and avionics health.

Space Environment Technologies is also a proud member of the American Commercial Space Weather Association (ACSWA), an association dedicated to improving America's competitive edge in space.

I thank you and the co-sponsors for your leadership on this important issue.

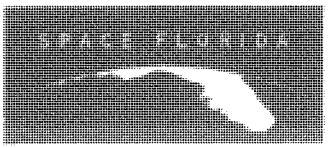
Sincerely,

W. Kent Tobiska

W. Kent Tobiska
President
Space Environment Technologies

CC: U.S. Rep. Brian Babin and U.S. Rep. Jim Bridenstine

1676 Palisades Dr., Pacific Palisades, CA 90272-2111 • 310-573-4185 (phone) • 310-454-9665 (fax) • http://SpaceWx.com



8 June 2017

The Honorable Lamar Smith
Chairman
Committee on Science, Space, and Technology
United States House of Representatives
2409 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member
Committee on Science, Space, and Technology
United States House of Representatives
2468 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson:

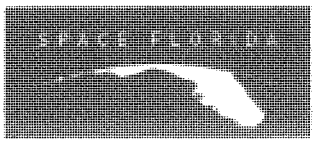
Space Florida supports the Committee on Science, Space and Technology's markup of H.R. 2809, the American Space Commerce Free Enterprise Act (ASCFEA), introduced by Chairman Smith, Chairman Babin, and Representative Bridenstine.

The State of Florida is home to the world's busiest spaceport. This year, more than 30 launches are manifested, and the Cape Canaveral Spaceport is actively preparing for a significantly increased launch cadence in the coming years. In addition, a number of emerging space actors have set up shop in the Sunshine State, with exciting plans to pursue space commerce activities aimed at exploring, developing, and utilizing space resources. This bill creates a transparent and predicable approval process for existing and emerging in-space activities, which will provide space actors the certainty needed to attract capital, obtain licenses, and ultimately, launch to and operate in space.

Space Florida is very encouraged by the bill's "light touch" approach, and by the explicit limitations on U.S. Government actions that would delay or inhibit U.S. companies from pursuing space commerce activities. We believe this initiative will help ensure that the United States has the most competitive and proactive approach to opening the space frontier for economic benefit.

The designation of the Secretary of Commerce and an Assistant Secretary-level Office of Space Commerce is a reasonable and effective solution to addressing the administrative requirements for international treaty compliance. We believe the proposed approach will promote U.S. private sector activities in space without compromising treaty commitments intended to protect the outer space environment and celestial bodies.

While we commend the Committee for its timely approach regarding commercial on-orbit operations, Space Florida strongly supports a parallel elevation of an Assistant Secretary within the Department of Transportation to promote and, as necessary, regulate, commercial space transportation. This would elevate and highlight the USDOT role and responsibility in promoting and enabling the U.S. space transportation infrastructure and the commercial space transportation industry as an integral element of the nation's transportation system, recognizing its growing importance to the nation's economic and



security interests on a par with other modes of transportation such as aviation, highways, and maritime transportation.

We are eager to work in the future with the Committee on the development of those policies which will be administered by both Transportation and Commerce, but we remain encouraged that the proposed legislation under review at present provides an effective format for execution.

Space Florida commends the Committee's leadership and support for the sustained growth of the commercial space industry and greatly appreciates the opportunity to discuss and provide feedback on this impactful piece of legislation.

Sincerely,

James Kuzma
Chief Officer Officer
Space Florida

sf 175 - jp-jk

June 8, 2017

The Honorable Lamar Smith
Chair, House Committee on Science,
Space & Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member, House Committee on
Science, Space & Technology
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson:

We are writing to convey our strong support for the "American Space Commerce Free Enterprise Act of 2017" (ASCFEA), and our organizations want to commend all the parties involved in the development of the bill.

The existing status quo is no longer fit for the modern space industry. New companies looking to compete in the large remote sensing market struggle with cumbersome regulations that are out of date and place an undue barrier to entry. The lack of a single, well-defined body of authority responsible for certification, authorization, and supervision of non-governmental space activities creates undue complexity. With this challenging regulatory environment and lack of clear lines of authority, our nation's emerging newspace industry is disadvantaged in the global competitive landscape.

Given that enabling both space development and space settlement are vital to the strategic future of the United States, we need a solution that ensures we will not only continue to meet our obligations under the Outer Space Treaty, but also encourages and enables new non-governmental space activities to be pursued. Therefore, we are glad to see long-standing issues related to commercial remote sensing licenses are being addressed, and that a transparent, timely, and appealable regulatory process would be available for new non-traditional space activities upon passage of this bill.

We want to thank the Chairman Smith, Chairman Babin, and Congressman Bridenstine, and their staffs, for all the work that went into this bill. Finally, we want to encourage all parties to remember that the surest way to derive benefits from space is by positioning the United States to enable space development and space settlement on issues such as these, and we look forward to working with you and your offices on these and other matters related to space.

Sincerely,

Andrew Newman,
Chairman, Students for the Exploration and Development of Space

Josh Guild
Interim Executive Director, Space Frontier Foundation

June 6, 2017

The Honorable Lamar Smith
Chairman
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

Thank you for your work on the American Space Commerce Free Enterprise Act (ASCFEA). As leaders in the U.S. commercial remote sensing satellite industry, we appreciate the attention that has been given to this important issue, and the willingness to reform an outdated regulatory process. Collectively, we want to express our support for the Remote Sensing provisions of the Act. We believe that were they to become law these provisions will help to ensure that U.S. companies are able to stay at the cutting edge of technology and maintain international leadership.

In the nearly three decades since it's commercialization, remote sensing has become a critical part of everyday life. From something as simple as finding the nearest coffee shop to ensuring first responders have the most accurate up to date information, to military applications and human rights, remote sensing contributes to our location-enabled lives in every way. This is why it is so important that rules and regulations support and not hinder industry's ability to innovate and grow.

We believe this bill will do just that by presuming approval, redefining what needs to be regulated, streamlining the permitting process with actionable deadlines, increasing transparency and establishing an Assistant Secretary of Space Commerce. The passage is absolutely necessary to U.S. industry and we hope to see full bipartisan support.

Again, thank you for your work on this bill and for your support of our industry. We greatly appreciate the efforts.

Sincerely,

Jonathan Rosenblatt
General Counsel
Spire Global, Inc.

Robbie Schingler
Co-Founder & Chief Strategy Officer
Planet Labs, Inc.

Marcy Steinke
Senior Vice President
Government Relations & Public Policy
DigitalGlobe, Inc.

1727 15th Street NW
Suite 800
Washington, DC 20005
7 June 2017

The Honorable Lamar Smith
Chair, House Committee on Science, Space & Technology
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member, House Committee on Science, Space & Technology
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson:

I am writing on behalf of the 70+ companies and organization in strong support of the Committee on Science, Space and Technology's markup of the American Space Commerce Free Enterprise Act (ASCFEA), as introduced by Chairman Smith, Chairman Babin, and Representative Bridenstine. This legislation clearly reflects the Committee's continued bipartisan support for America's commercial space industry, and we endorse it being reported favorably to the House of Representatives for further consideration.

Specifically, the member companies and institutions of the Commercial Spaceflight Federation are in strong agreement with all of the goals and most of the key elements of your legislation:

- Significant reform of the Commerce Department's obsolete, burdensome, and dysfunctional regime for licensing commercial remote sensing satellites is especially welcome. While the hardworking staff of the Office of Commercial Remote Sensing Regulatory Affairs inside NOAA do their best to administer an out-of-date law and unworkable regulations, this legislation's wholesale revision of current law and elevating this responsibility up to a revitalized Office of Space Commerce in the Office of the Secretary will help the U.S. remote sensing industry realize its full job-creating potential.

- ASCFEA's other goal is to formally address the U.S. government's obligations under Article VI of the Outer Space Treaty to authorize and supervise "non-traditional" commercial space activities. This legislation creates a clear, objective, transparent, timely and appealable process for American companies to pursue innovative space goods and services beyond telecommunications, remote sensing, and space transportation.

- CSF commends the Committee's inclusion of a specific funding authorization for the Office of Space Commerce to handle this expanded responsibility, because inadequate funding and staffing of other federal space regulatory functions (e.g. FAA/AST and NOAA/OCRSRA) has been a continuing challenge to industry advancement and growth.

- CSF supports the creation of a new Private Space Activity Advisory Committee that will help the Secretary of Commerce and a new Assistant Secretary for Commercial Space carry out their responsibilities under this legislation and report to Congress annually on progress and issues relating to U.S. private sector space activities and the federal government's authorization and supervision thereof. CSF will actively help Congress and the Department fully utilize this external review mechanism to improve federal oversight and streamlined regulation of private sector space activity.

CSF and its members will continue to engage with the Committee, the rest of Congress, and other federal stakeholders as this bill continues on the legislative process. In this manner we would like to highlight two remaining topics for which we would like to work with the Committee and Congress to resolve:

- There is a strong consensus among the membership that the use and definition of "certification" to describe the approval of a new commercial space activity is problematic, because it has many other associations in the aerospace industry which are not appropriate for the "light touch" regime you are pursuing.
- The choice of the Department of Commerce, specifically the Office of Space Commerce, as the location of the new authorization and supervision responsibility under Section 3 of the bill.

Again, thanks to you, Chairman Babin, Representative Bridenstine, and all of your staffs for developing this important legislation, and for giving the members of the Commercial Spaceflight Federation continuing opportunities to discuss, ask questions, and provide feedback on the key aspects of the bill. We commend your continuing leadership and support for the U.S. commercial space industry, and wish you a successful markup tomorrow.

Sincerely,

Eric W. Stallmer
President
Commercial Spaceflight Federation

CC:
The Honorable Kevin McCarthy
The Honorable Brian Babin
The Honorable Jim Bridenstine
The Honorable Ami Bera
The Honorable Ed Perlmutter
The Honorable Derek Kilmer

SQ WITT & ASSOCIATES

June 8, 2017

The Honorable Lamar Smith
Chairman, House Committee on Science, Space and Technology
2321 Rayburn House Office Building
Washington DC, 20515

The Honorable Eddie Bernice Johnson
Ranking Member, House Committee on Science, Space and Technology
394 Ford House Office Building
Washington DC 20515

Dear Chairman Smith and Ranking Member Johnson:

I am writing in support of the Committee on Science, Space and Technology's markup of the American Space Commerce Free Enterprise Act (ASCFEA), as introduced by Chairman Smith, Chairman Babin, and Representative Bridenstine. This legislation clearly reflects the Committee's continued bipartisan support for America's commercial space industry. I endorse it being reported favorably to the House of Representatives for further consideration.

Very Respectfully,

Stuart Q. Witt

cc. Tom Hammond; Tiffanii Woolfolk

760.382.5757 | STUART@WITTANDASSOC.COM

Space Subcommittee Chairman Brian Babin and Representative Jim Bridenstine are coauthors and original cosponsors of the bill. They both have worked diligently for several years to advance this legislation. I'm glad to have Representative Perlmutter and former Science Committee Member Derek Kilmer as original co-sponsors as well. It speaks to the hard work of all Committee Members and staff in developing this common sense, bipartisan, regulatory reform bill.

This transformative groundbreaking legislation declares in word and intent that America is open for business in space. I strongly recommend this bill and urge my colleagues to support it.

PREPARED STATEMENT OF CHAIRMAN SMITH

Good afternoon. Today we mark-up H.R. 2809, the *American Space Commerce Free Enterprise Act of 2017*.

H.R. 2809 establishes a legal and policy environment intended to unleash American free enterprise and business, assure conformity with Outer Space Treaty obligations, and ensure that the United States will lead the world in commercial space activities throughout the 21st century.

This bill will promote investment and innovation, resulting in the creation of new high paying and high value jobs across the country.

It will increase American competitiveness and attract companies, talent, and money that otherwise would have gone to other countries. It ensures America and its workforce will benefit from the new space economy.

The problem this bill seeks to address is the kind of legal uncertainty that arose after Bigelow Aerospace and Moon Express sought payload approval from the Department of Transportation for its non-traditional space activities.

The payload review and approval process is meant to prevent launches of payloads that jeopardize American interests and safety. It is not designed to satisfy the State Department's concerns about complying with Article VI of the Outer Space Treaty.

Under the Treaty, signatories are to authorize and provide continuing supervision of their country's non-governmental space activities. In the case of Bigelow and Moon Express, the Executive Branch stated that it would not be able to assure the public that new and innovative space activities would be approved for launch in the future.

The goal of this bill is not to regulate space broadly or to address all of the possible future challenges that the private sector will face in outer space. Doing so would be premature and likely stifle innovation and investment.

Instead, the bill takes a common sense approach by establishing a legal foundation upon which U.S. industry can flourish.

It establishes a transparent U.S. authorization and supervision certification process for non-governmental space activities that provides regulatory certainty for the U.S. commercial space sector. It assures compliance with United States Outer Space treaty obligations and addresses national security concerns in the least burdensome manner possible.

The bill includes a provision that consolidates at the Department of Commerce's Office of Space Commerce existing regulatory authority spread across three different federal agencies. America gets a "one-stop shop" for authorizing activities that will take place in outer space.

It also streamlines remote sensing regulations to ensure that United States national security is addressed not by holding America's space industry back, but by empowering it to lead the world.

Absent this bill, American industry would continue to face legal uncertainty. Innovation would be subject to a burdensome and open-ended regulatory process, with no assurance of Outer Space Treaty compliance.

An initial draft of the legislation before us now was publicly presented over a month ago for any and all input. We have spent the past month meeting, listening, and considering specific, detailed comments from outside stakeholders, interested federal agencies, the Administration, and our Committee colleagues including those from the minority side of this Committee. Many if not most of their recommendations and requested changes have been included.

Over the past few days, we have received letters and statements of support for the bill from the following entities:

AgileAero, Inc.
Atmospheric and Environmental Research
Atmospheric & Space Technology Research
Axiom Space, LLC
Bigelow Aerospace, LLC
Blue Origin
Carmel Research Center, Inc.
The Commercial Spaceflight Federation
Digital Globe, Inc.
GeoOptics
Moon Express Inc.
Panasonic
Planet Labs, Inc.
Satellite Industry Association
Space Frontier Foundation
Spaceport Strategies, LLC
Spire Global, Inc.
Space Environment Technologies
SpaceX
Students for the Exploration and Development of Space, and TechFreedom

Without objection, the letters we have received will be included in the record. I want to thank these groups for their support of the bill.

Space Subcommittee Chairman Brian Babin and Representative Jim Bridenstine are co-authors and original co-sponsors of the bill. They both have worked diligently for several years to advance this legislation.

I'm glad to have Representative Perlmutter and former Science Committee member Derek Kilmer as original co-sponsors as well. It speaks to the hard work of all Committee members and staff in developing this common sense, bipartisan, regulatory reform bill.

This transformative groundbreaking legislation declares in word and intent that America is "open for business" in space. I strongly recommend this bill and urge my colleagues to support it.

Chairman SMITH. That concludes my opening statement, and Ranking Member, the gentlewoman from Texas, Ms. Johnson, the Ranking Member, is recognized for hers.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

Thank you very much, Mr. Chairman, and I want to thank you for holding today's markup of H.R. 2809, the *American Space Commerce Free Enterprise Act of 2017*. I want to also thank you for delaying it so that we could attempt to work together. That is much appreciated.

The issues that this bill attempts to address are important and need to be addressed. Unfortunately, I think the solutions provided in H.R. 2809 may cause more problems than they solve. For this reason, I cannot support the bill in its current form. I think there is a bipartisan agreement concerning the problems being addressed at today's markup.

There is a regulatory gap in our current structure of oversight over commercial space activities. We currently regulate launch and reentry activities, Earth imaging, and space communications, but other in-orbit or deep-space operations are essentially unregulated. I think it is widely acknowledged that these orbital activities need to be more closely overseen, especially as the problems of space debris have increased.

The other problem addressed by H.R. 2809 is in the area of commercial remote sensing. Again, I think there is bipartisan agreement that this subject needs to be addressed. U.S. companies are increasingly at a competitive disadvantage versus their foreign competitors due to the current regulatory and oversight situation in the United States in the area of commercial remote sensing.

Clearly, something needs to be done here to align our oversight system to the realities of the global marketplace.

Unfortunately, the approach the Majority has taken with H.R. 2809 may cause more problems than it fixes. For instance, instead of housing space regulatory authority at an agency with existing expertise and existing space regulatory activities, H.R. 2809 would essentially create an entirely new bureaucracy to implement this law. The office that this bill assigns these responsibilities to has a total of three full-time employees right now. This makes no sense to me, and it makes no sense to many in the stakeholder community.

We have an existing space regulatory body, created by the Science Committee, and housed at the Department of Transportation, which has the base of expertise to implement this law. I think it makes much more sense to place these new responsibilities within this existing office rather than to create an entirely new and different regulatory body in a different Department of the government.

Likewise, with regard to commercial remote sensing, this bill takes an unnecessarily expansive approach to addressing the problem. The underlying bill would make the Secretary of Commerce the judge, jury, and executioner with regard to national security issues raised in the commercial remote sensing regulatory process. This is a dramatic turn away from the interagency process that has historically been used to address national security issues in space. Again, instead of improving the process for commercial remote sensing, this bill blows up that process. I think a more incremental improvement to the process would be more constructive. And I think we should acknowledge the reality that the approach this bill takes with regard to national security issues and international obligations will likely doom any chance for enactment of this legislation.

There are numerous other issues, both large and small, with this legislation. Many of these issues have been pointed out by the stakeholder community both in government and industry. I think if those stakeholders had been consulted prior to drafting this legislation, rather than as an afterthought, we could have avoided these problems entirely.

We have good staff here on the Committee. For instance, my aerospace staff have over 100 years of combined experience working on these issues in government, industry, and NGO's. Nonetheless, even with their wealth of experience and expertise, I wouldn't want them to craft complex legislation without first consulting the full cross-section of the affected stakeholder community. The result of not consulting with that stakeholder community from the outset is that we have a bill before us today that is needlessly complex, unsupported by broad swaths of the government and industry, and very unlikely to be enacted into law.

Mr. Chairman, I applaud your efforts to address two very real problems with our commercial space regulatory regime. However, I think we'd be better served by hitting the reset button on this legislation.

I thank you, and I yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you Chairman Smith. And I want to thank you for holding today's markup of H.R. 2809, the *American Space Commerce Free Enterprise Act of 2017*. The issues that this bill attempts to address are important and need to be addressed. Unfortunately, I think the solutions provided in H.R. 2809 may cause more problems than they solve. For this reason, I cannot support the bill in its current form.

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However, I think we would be better served by hitting the reset button on this legislation.

Thank you, and I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

The Chairman of the Space Subcommittee, the gentleman from Texas, Mr. Babin, is recognized for an opening statement.

Mr. BABIN. Thank you, Mr. Chairman. I appreciate it. Good morning—or good afternoon.

I want to say that I strongly support H.R. 2809, the *American Space Commerce Free Enterprise Act of 2017*. I am grateful to have worked with Chairman Smith and Representative Bridenstine in the development of this bill. I am also very glad that this is a bipartisan bill, with the support of Representatives Perlmutter and Kilmer.

The *American Space Commerce Free Enterprise Act* is a commonsense bipartisan bill that streamlines regulatory processes, limits burdensome government intrusion, promotes American innovation and investment, protects national security, and satisfies our international obligations.

One of the fundamental drivers for this legislation has been that innovative American companies are pushing the boundaries. When the Senate ratified the Outer Space Treaty 50 years ago, free enterprise in outer space was an idea, but not yet a reality. Today, not only does the U.S. free enterprise exist in outer space, it is innovating at an unprecedented pace. From asteroid mining, to private moon missions, to satellite servicing, to remote sensing constellations, there is great promise that American enterprise will soon unlock new wealth and scientific benefits.

But this promise is threatened, threatened by expansive unchecked regulatory authority, cumbersome non-transparent regulatory processes, and misperceptions about United States Outer Space Treaty obligations.

For several years, the Space Subcommittee has heard concerns from our stakeholders that they need greater regulatory certainty to attract investment and to succeed. Stakeholders also reported that while they want to stay in America, due to regulatory burdens and uncertainty, they might need to go overseas.

The *American Space Commerce Free Enterprise Act* addresses these concerns without compromising our cherished principles of liberty. It provides for presumptions of approval and requires the government to take affirmative steps before conditioning or denying proposed space or remote sensing operations. It places the burden of demonstrating inconsistency with Outer Space Treaty obligations and national security requirements of the United States with the government and not with the applicant. It curtails vague, overreaching regulatory authority and prevents tolling of statutory adjudication timelines. It ensures U.S. industry receives a timely and transparent determination on applications.

The bill recognizes legitimate national security equities and provides for the condition or denial of authorized space activities with remote sensing systems that are a significant threat to U.S. national security in certain circumstances. But it protects against abuses of interagency discretion by requiring an explanation and evidence of the threat before conditions or denial can be made.

In order to ensure the Office of Space Commerce is empowered to represent the interests of our citizens and the private sector, the Director of the Office of Space Commerce is elevated to be the Assistant Secretary for Space Commerce.

The Act also advances important public policy interests. The bill establishes a mandatory safety consultation between private and Federal Government operators. The goal of this consultation is for the affected parties to reach a voluntary agreement to mitigate

safety risks. For parties subject to U.S. jurisdiction, the Act provides for Federal district court jurisdiction for any civil action resulting from certified or permitted space operations.

To protect against foreign harmful interference, the Act directs the President to protect against acts of foreign aggression and foreign harmful interference. The Act also addresses concerns of harmful contamination of the Earth or of celestial bodies. Pursuant to our international obligations under the Outer Space Treaty, operations may be conditioned or denied by the Secretary of Commerce, in consultation with appropriate agencies, such as NASA to address harmful contamination.

The bill posits longstanding United States policy, confirmed by both Department of State and NASA, that COSPAR planetary protection guidelines are not international obligations of the United States. This was done to allow all stakeholders, including the scientific community and industry, to work together as activities expand beyond scientific exploration and use, to address mutual interests, not by proscribing COSPAR guidelines as binding international law, but by allowing the Outer Space Treaty to guide our activities.

I strongly support this bill and urge my colleagues to do the same, and I yield back, Mr. Chairman.

PREPARED STATEMENT OF MR. BABIN

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I strongly support this bill and urge my colleagues to do the same.

Chairman SMITH. Thank you, Mr. Babin.

And the gentleman from Oklahoma, one of the principal authors of the bill, is recognized for his opening statement. Mr. Bridenstine.

Mr. BRIDENSTINE. Thank you, Mr. Chairman.

For several years now, there has been uncertainty around which government agency has the responsibility to approve nontraditional space activities while ensuring conformity with the Outer Space Treaty. This uncertainty has hurt capital formation and innovation. It also sends American companies scrambling overseas to countries such as Luxembourg and the United Arab Emirates. This is the exact opposite environment we need in this country.

I have made solving this issue one of my top priorities in Congress, and as the Chairman noted, Bigelow Aerospace and Moon Express have been blazing a trail here. Last year, I proposed legislation to provide for an Enhanced Payload Review. The *American Space Commerce Free Enterprise Act* takes from that and builds upon much of the consensus we gained around the policies in that draft legislation. The *American Space Commerce Free Enterprise Act* provides certainty to industry by granting the ability to approve commercial space activities to a single authority. I want to be clear: We need a single authority. In this case, we've determined that the best case would be the Secretary of Commerce. The Office of Space Commerce will be elevated to a more prominent position within the Commerce Department and will perform a simple review of proposed operations to check that they are not violating the United States' obligations under the Outer Space Treaty. This gives the executive branch the tool it claims that it needs while instituting a clear, known, transparent, and timely process for American industry to prosper.

There is discretion built into this bill for the Secretary to condition or even deny a certification. I think this is an important piece to have from a policy standpoint. However, the onus here to prove there is a problem is now going to be on the government. The mes-

sage Congress is trying to send is, as the Chairman said, that America is open for business, especially in space.

However, Congress also recognizes that there are other policies and interests of the United States that are affected by private sector space activities, one of them being national security. As a former Naval aviator, a current Oklahoma Air National Guardsman, and a Member of the House Armed Services Committee, there is nothing more important to me than the national security of the United States. I want to be clear: This bill actually improves the national security of the United States.

This is why the *American Space Commerce Free Enterprise Act* rolls in remote sensing reform. National security interests for the foreseeable future will require remote sensing systems, many of which are now going to be provided commercially. By requiring a national security risk assessment during the remote sensing system permitting process, we are ensuring national security concerns are met. This has also provided an opportunity in this bill for us to reform the broken system of remote sensing licensing that is overly restrictive, thwarts industry, and hands an advantage to foreign competitors.

As the author of Title II of the *Commercial Space Launch Competitiveness Act of 2015*, along with my good friend from Colorado, Ed Perlmutter, I have been committed to fixing this issue for many years. The *American Space Commerce Free Enterprise Act* improves the remote sensing permitting process by creating a single decision point, increasing transparency of the process, avoiding unnecessary reviews of technologies available on the market or that have already been approved, and preventing the interagency process from indefinitely delaying decisionmaking. These changes will allow our remote sensing industry to once again be the world leader.

The bill also goes farther than current law to provide for the physical safety of U.S. Government assets in orbit. After operations are certificated, the government can do an assessment for physical safety issues, and a consultation forum will be held to come to a solution that can prevent any disastrous collisions and protect the safety of government and private assets.

This bill will engender a growth in commercial space activity that we have not yet seen in the United States of America. This is a good growth of space activity. But this growth will continue to put further stress on the agency responsible for approving launches: The FAA Office of Commercial Space Transportation. Congress needs to be mindful that we must be proactive on that office as well, and I have an amendment to begin addressing this issue later here in the markup.

Mr. Chairman, this is a very strong and a very bipartisan bill. This is a good place to begin the legislative process as we work with the rest of our House colleagues, the Senate, and the Administration to eventually get a solution put into law.

I want to thank you, Chairman Smith, for all of your hard work on this as well as Chairman Babin. We're sending a clear message here today. I'm proud to support the bill, and I look forward to favorably reporting it out of the Science Committee.

I'd also like to thank a couple of the staffers, Christopher Ingraham in my office has been working overtime on this, and Mr.

Chairman, your staffers, Chris Wydler, Tom Hammond, Mike Mineiro, and Shana Dale have been on the phone day in and day out for many, many months now, and thank you for allowing them to work so hard on this bill.

Mr. Chairman, thank you. I yield back.

PREPARED STATEMENT OF MR. BRIDENSTINE

Mr. Chairman, I am glad we are here today marking up the *American Space Commerce Free Enterprise Act*. For several years now, there has been uncertainty around what government agency has the responsibility to approve nontraditional space activities while ensuring conformity with the Outer Space Treaty. This uncertainty has hurt capital formation and innovation. It also sends American companies scrambling overseas to countries such as Luxembourg or the UAE. This is the exact opposite environment we need in this country.

I have made solving this issue one of my top priorities in Congress. Last year, I proposed legislation to provide for an Enhanced Payload Review. The *American Space Commerce Free Enterprise Act* takes from that and builds upon much of the consensus we gained around the policies in that draft legislation.

The *American Space Commerce Free Enterprise Act* provides certainty to industry by granting the ability to approve commercial space activities to a single authority, in this case the Secretary of Commerce. The Office of Space Commerce will be elevated to a more prominent position within the Commerce Department and will perform a simple review of proposed operations to check that they are not violating the United States' obligations under the Outer Space Treaty. This gives the executive branch the tool it claims needs while instituting a clear, known, transparent, and timely process for American industry to prosper.

There is discretion built into this bill for the Secretary to condition or deny a certification. I think this is important to have from a policy standpoint, however, the onus to prove there is a problem is now on the government. The message Congress is trying to send is: America is open for business in space.

However, Congress also recognizes that there are other policies and interests of the United States that are affected by private sector space activities, one of them being national security. As a former Naval aviator, current Oklahoma Air National Guardsman, and member of the House Armed Services Committee, there is nothing more important to me than the national security of the United States. This bill improves national security.

This is why the *American Space Commerce Free Enterprise Act* rolls in remote sensing reform. National security interests - for the foreseeable future - will be implicated by remote sensing systems, both of the Earth and objects in orbit. By requiring a national security risk assessment during the remote sensing system permitting process, we are ensuring national security concerns are met.

This has also provided an opportunity in this bill for us to majorly reform the broken system of remote sensing licensing that is overly restrictive, thwarts industry, and hands an advantage to foreign competitors. As the author of Title II of the *Commercial Space Launch Competitiveness Act of 2015*, along with my good friend from Colorado Ed Perlmutter, I have been committed to fixing this issue.

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This bill will engender a growth in commercial space activity that we have not yet seen. A good growth. But this growth will continue to put further stress on the agency responsible for approving launches - FAA/AST. Congress needs to be mindful that we must be proactive on that office as well, and I will have an amendment to begin addressing this issue later in the mark up.

All in all Mr. Chairman, this is a very strong and bipartisan bill, which was very important for me that we make sure this bill, and space, remained bipartisan. This is a good place to begin the legislative process as we work with the rest of our

House colleagues, the Senate, and the Administration to eventually get a solution put into law.

I want to thank Chairman Smith and Chairman Babin for working with me on this, we have been working hand in hand to craft the *American Space Commerce Free Enterprise Act*, and we are sending a clear message that American innovation will lead the world. I am proud to support the bill and look forward to favorably reporting it out of the Science Committee.

I'd like to thank the staff for their work on this issue: My staffer Christopher Ingraham, and Science Committee staffers Chris Wydler, Tom Hammond, Mike Mineiro, and Shana Dale.

I yield back.

Chairman SMITH. Thank you, Mr. Bridenstine. I appreciate the compliments directed toward staff and the legislation as well.

We will now proceed with amendments in the order listed on the roster. The first amendment on the roster is a Manger's Amendment, and the clerk will report the amendment.

The CLERK. Amendment to H.R. 2809 offered by Mr. Smith of Texas, amendment #012.

Chairman SMITH. Without objection, the amendment will be considered as read, and I'll recognize myself in support of the Manager's Amendment.

The Manager's Amendment makes technical corrections and minor changes to the bill. Among these, it extends the time the Secretary of Commerce has to adjudicate certificate and permit applications from 60 to 90 days. The amendment also says that the Secretary of Commerce shall consult as the Secretary considers necessary with the heads of other relevant agencies. This change was made to ensure that departments and agencies such as NASA, the Department of Defense or the Department of State have a way to inform Secretary of Commerce determinations on proposed space activities.

However, further modifying the consultation authorities under the bill beyond "shall consult as the Secretary considers necessary" puts at risk the very purpose of the bill. Additional changes would undermine the ability of the Secretary to provide a fair and equitable adjudication of applications and open up the certification and permitting processes to excessive interagency control.

Today, remote sensing systems are subject to a regulatory regime where at least three different departments and agencies have the authority to condition or deny applications. As a result, licensing actions occur months and even years over the 120-day determination timeline required by law. Companies are applying and waiting without any understanding as to why NOAA takes so long to get back. Stakeholders report significant uncertainty with licensing actions including modifications to operational license conditions without notice or due process. American remote sensing startups want to stay in the United States but most plan for overseas operations due to the uncertainty in our current regulatory approval process.

Experience also has taught us that while the Department of Transportation retains exclusive authority to make determinations for international obligations for laundry and reentry activities, inflexible consultation provisions have in practice become de facto concurrence authorities for other departments and agencies. This is not to say that the intent of the bill is to undermine the ability of the executive branch to appropriately inform the Secretary of Com-

merce about remote sensing applications. On the contrary, the proposed amendment will clearly provide such a process.

We must also recognize that any major disagreement between the Secretary of Commerce and other departments or agencies regarding a proposed operation will be elevated to the White House for adjudication. In such interagency environments, if we move the needle too far in favor of other agencies, the Secretary of Commerce will not be able to represent the interests of the applicant and the national interest of free enterprise.

For all these reasons, I support this amendment, and not only ask my colleagues to do the same, but I want to recognize the gentleman from Colorado, Mr. Perlmutter, and give him credit for these changes as well.

Let's see. If there any further discussion on the amendment? The gentleman from Colorado is recognized.

Mr. PERLMUTTER. Thank you, and I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. PERLMUTTER. I'm here today as a supporter and cosponsor of H.R. 2809. The United States currently has the best aerospace industry in the world. In order to stay No. 1, we need to provide it certainty so that the industry can attract investment and continue innovating to push our country forward.

We also want to help set the standard for how to regulate space activities so there is a level playing field for our American industry. That is why we need a certification process as provided in the bill to ensure compliance with the Outer Space Treaty. I understand there's still some discussion amongst industry and from involved agencies about where this authority should be placed, either within the Office of Space Commerce as under the bill or under the Office of Space Transportation at the FAA, or maybe someplace else. I hope this discussion continues and we reach a consecutive as we continue through the legislative process.

I hope our Committee continues to also have the discussion on space traffic management and how to properly protect both U.S. Government and other U.S. commercial spacecraft to avoid conflicts and costly problems for everyone.

The second part of the bill, and the Chairman was just referring to it, makes important reforms for the remote sensing industry. As many of may you know, a major remote sensing company named Digital Globe is headquartered in my district in Westminster, Colorado. I've heard the stories about how long they've waited for a license determination under NOAA: Over 3 years and counting in one space. This is well past the 120-day deadline currently required in statute because there is no mechanism to enforce any timeline. This is why I believe the reforms in section 4 of the bill are overdue and are necessary. Those companies in the business, in the remote sensing business, need certainty so they can make sound plans and attract investors and customers. All of these regulatory delays mean lost revenue and significant expenses fighting for approval. Section 4 of the bill fixes that.

I'd like to take a moment and thank Congressmen Smith, Babin and Bridenstine for working with me on this bill. I believe they've made improvements to the text of the bill including specific consultation language, as the Chairman just discussed, which requires

consultation with other Federal agencies, ensuring proper determinations regarding the Outer Space Treaty, national security, and authorizing funding for the Office of Space Commerce.

I'm grateful the sponsors included two provisions I asked for in the Manager's Amendment. You're extending the deadlines in the bill from 60 days to ensure the Office of Space Commerce has the time needed to get its decisions right. Additionally, the amendment strengthens the consultation language to require the Secretary of Commerce to consult with other relevant Federal agencies as he deems necessary when making the determinations.

For these reasons, I support the bill and I look forward to continuing to improve it as it goes through the process, and I yield back.

Chairman SMITH. Thank you, Mr. Perlmutter, and the gentleman from Texas, the Chairman of the Subcommittee, is recognized for a statement as well.

Mr. BABIN. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. BABIN. I wish as well to speak in favor of the amendment. One of the changes made by this amendment is extending the time that the Secretary of Commerce has to adjudicate certificate and permit applications from 60 to 90 days. This change is being made after discussions with stakeholders and other Members, specifically, the minority. I believe this is a reasonable accommodation that would grant the Secretary of Commerce time necessary to properly adjudicate applications without overly burdening the applicant.

However, I caution extending this timeline beyond 90 days. The Secretary and the interagency consultation process must be held accountable. Without a firm deadline, experience has shown that the interagency process can lead to long delays in violation of the law. Today, under existing law, remote sensing licenses are required to be adjudicated within 120 days. Reality is that applications have in some cases, as Mr. Perlmutter mentioned, taken years in clear violation of the law. We cannot repeat this mistake.

I also completely agree with the points that Chairman Smith made regarding the consultation language in this amendment, and while a change in the consultation from "may" to "shall" is a reasonable change to address stakeholder concerns further modifying the consultation authorities under the bill beyond "shall consult as the Secretary considers necessary" puts at risk the very purpose of this bill.

I support this amendment and I urge my colleagues to do the same, and I yield back, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Babin.

Is there any further discussion on the bill?

If not, the gentleman from Oklahoma, Mr. Bridenstine is recognized.

Mr. BRIDENSTINE. Thank you, Mr. Chairman. I'll just be quick.

I wanted to thank my friend from Colorado, Ed Perlmutter, because he provided a lot of great input, same with my friend from California, Mr. Bera, a lot of great input. We have made many efforts to accommodate those changes, and in fact, appreciate Ed for

not only—Mr. Perlmutter is my enemy. How about that? Does that help you in your primary? No, I appreciate his good-faith effort in trying to make this a better bill, and I look forward to working with him in the future to make it even better.

Chairman SMITH. Thank you, Mr. Bridenstine.

If there is no further discussion on the amendment, all in favor of the Manager's Amendment say aye.

All opposed, no.

The ayes have it, and the amendment is agreed to.

The next amendment on the roster is the amendment in the nature of a substitute offered by the Ranking Member, the gentlewoman from Texas, and she is recognized for that purpose.

Ms. JOHNSON. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment in the nature of a substitute to H.R. 2809, offered by Ms. Eddie Bernice Johnson of Texas, amendment #002.

Chairman SMITH. Without objection, the amendment is considered as read, and the Ranking Member is recognized to explain her amendment.

Ms. JOHNSON. Thank you.

When I first learned that the Chairman wanted to pursue commercial space legislation this spring, I let him know that I wanted to work with him to see whether we could develop a bipartisan piece of legislation that all Members could support. Majority and minority staff tried hard to achieve such a result but ultimately too many significant issues still remain to be resolved with this bill when today's markup was noticed.

As I mentioned in my opening remarks, many concerns were raised about the bill's provisions by NASA, national security agencies, the State Department, and industry stakeholders, among others. In fact, when NASA reviewed the latest version of the bill we're marking up today, the agency identified even more concerns than were included in its original set of comments. In short, this bill is not a bill that can be fixed with a few amendments at today's market.

That said, the issues that the bill attempts to address are important ones. I feel an obligation to propose an alternative that can address these issues, not just oppose the current bill, and this is what my amendment is intended to do. Fortunately, we already have a roadmap for much of this work. Congress asked for and received guidance from the Administration last year regarding certification of innovative new space activities. The legislative proposal represented a consensus of all the agencies that will need to deal with these space systems and ensure they meet our national security and international obligations. Section 3 of my amendment essentially codifies that interagency consensus on mission certification. Among the key features of that consensus approach is a decision to not reinvent the wheel but instead to leverage the competencies that have been built up in FAA's Office of Commercial Space Transportation and utilize existing robust interagency review process. One of the strengths of that interagency process is that it can help provide companies and investors the assurance

that an agency will not try to block their proposed activities at the last minute simply because the agency hadn't had an opportunity to review the proposal. As mentioned in my opening statement, that needn't require creating yet another Federal bureaucracy with all of the resulting costs and delays that will accompany its creation.

In essence, the amendment takes a light-touch approach to regulating the emerging non-traditional commercial space systems. Rather than requiring page after page of convoluted legislative text, the amendment builds on the highly successful FAA space launch licensing process and provides a clean, straightforward path of certification of these innovative new space systems.

In addition, section 3 of the amendment is consistent with the consensus approach endorsed by the space professionals of the agencies that will have to deal with these new systems in marked contrast to the bill being marked up today.

With respect to commercial remote sensing licensing, my amendment again attempts to build on the existing process rather than blowing it up and starting over. The amendment proposes a number of reforms that have been urged by the remote sensing industry including shortened timetables for application reviews certainty that granting a license means that national security and international obligation concerns have been addressed and elevation of the remote sensing licensing function at the Commerce Department.

Equally importantly, it authorizes a significant increase in funding for the office that will be handling these remote sensing licensing applications. It is hard to criticize Commerce for the slowness of its licensing operation when Congress has too often failed to provide the resources and staffing the licensing office needs.

In conclusion, the amendment I'm offering today addresses head on the two issues that we are considering today and takes on an approach that is limited, allows the oversight of these new systems to evolve as we can more experience, and minimizes the cost and delays that will inevitably be incurred under the approach taken in this base bill.

However, I really can count. I learned to count over 75 years ago in Waco, Texas, and I realize that this amendment has very little chance of being adopted. So as I mentioned earlier, I don't think the issues being addressed today are inherently partisan and it is my hope that we can continue to work together and find common ground to support all aspects of the commercial space industry. In that light, I'm going to withdraw my amendment and hope that we can continue to work together to reach a consensus on this bill.

So I ask consent to withdraw the amendment, and I yield back.

Chairman SMITH. Without objection, the amendment is withdrawn, and I thank the gentlewoman for her comments.

I'm going to recognize myself in opposition to the amendment. Not to go into any great detail as I would have had it not been withdrawn, but I do want Members of the Committee on both sides of the aisle to recognize a little bit about the efforts we have made to try to make this a bipartisan piece of legislation.

This Committee has worked diligently to ensure that you international obligations and national security interests are met in the

least burdensome manner possible. On September 7, 2016, the Committee held a hearing titled "Commercial Remote Sensing: Facilitating Ownership and Leadership." On March 8th, 2017, the Committee held a hearing on regulating space, innovation, liberty and international obligations. We shared a discussion draft of the bill before us today with the Minority, stakeholders, and agencies more than a month ago. We participated in dozens of bipartisan meetings with stakeholders and the Minority. We incorporated dozens of edits that were responsive to all parties. We circulated an updated version of the draft bill last week days in advance of what is required by Committee rules. The Minority requested 11 specific changes to the bill. In the interests of good faith, we accommodated as many as we could, a great majority, in fact.

After making all those accommodations to the Minority, I was more than disappointed to see this amendment in the nature of a substitute, and while I won't go into all my objections to the amendment, I'll simply say in general the Ranking Member's amendment would strangle an industry in its early stages with burdensome regulations, force companies to relocate overseas, compromise national security, stifle innovation and economic competitiveness, and relegate the United States to a second-rate spacefaring Nation.

I'll be happy to share my additional objections with Members, but in the interest of time, I'll simply say that I am a little bit concerned about the ability of this Committee to process bipartisan bills if we can't agree on this piece of legislation that is so widely supported by so many interest groups, and after all the efforts we made, all the reassurances that we have received, I just hope that all individuals of the Committee will make up their own minds and reach their own conclusions as to whether they think this is a good piece of legislation.

That concludes my remarks, and we will now go to the third amendment to be offered by the gentleman from Oklahoma, Mr. Bridenstine.

Mr. BRIDENSTINE. Stand by 1 second, Chairman. OK, Mr. Chairman. This bill is intended to engender growth in commercial space activity that will be unlike any we have seen.

Chairman SMITH. The clerk will report the amendment.

Mr. BRIDENSTINE. Oh, yes, I have an amendment at the desk.

The CLERK. Amendment to H.R. 2809 offered by Mr. Bridenstine of Oklahoma, amendment #008.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. BRIDENSTINE. Thank you, Mr. Chairman.

This bill is intended to engender growth in commercial space activity that will be unlike any we have seen. Granting maximum certainty with minimal regulatory burden to non-traditional activities as well as improving the process for more traditional activity will encourage American entrepreneurs and innovators to take risks, to raise capital, and to start new ventures. These endeavors will need to get to space, and they will do hopefully on the top of American rockets, but in order to do that, the office that regulates

and promotes the commercial launch industry must be well positioned to carry out this job efficiently and effectively.

I have long been a vocal proponent of FAA's Office of Commercial Space Transportation, or sometimes called FAA AST. I have led the fight to provide it with increased resources and update the regulations under its purview. For this office to truly be effective, however, it cannot be buried within the FAA where it must compete for resources and it has to compete for focus. It must be moved back to the secretariat level within the Department of Transportation.

My amendment is very simple. It calls for a GAO study to assess the pros and cons of moving FAA AST out of the FAA and to make it an Assistant Secretary of Transportation position and the issues that would need to be addressed in such a move. While I am a firm believer that this move must be done, I think that we have to have full situational awareness so that we do it right and that our colleagues are comfortable with doing so.

Just a few seconds ago, Mr. Webster from Florida asked me how—if we were to privatize FAA how my amendment would be affected, and the question is a good one, and the answer is, I don't know. I want to make it very clear what this amendment is and what it does. We're just asking the GAO to do a study. If we were to take FAA AST, move it out of FAA move it under the Secretary of Transportation, and take the current Associate Administrator of the FAA into an Assistant Secretary of Transportation, that's what this study getting at. What does it require, what do we need to do to make that happen, and what will the impact be? And of course, the privatization of the FAA is a question that we don't if that's going to happen yet, No. 1, and No. 2, if it does happen, what will happen to AST if that does happen. So Mr. Webster had a great question. Hopefully this study will get us more smart on what that does.

So Mr. Chairman, if we don't address the relationship between what we are trying to do in the *American Space Commerce Free Enterprise Act* and the FAA AST, I fear we might be setting FAA AST up for failure. This amendment is a good first step in a process to support AST. Let me clear, when I say AST, I'm talking about the Office of Commercial Space Transportation. We want to support that office and move it back up to the Department of Transportation. All this amendment does is, it creates a study to see how we would do that, and if we did, what the implications would be.

With that, I urge its adoption, and I yield back.

Chairman SMITH. Would the gentleman yield to me before he yields back?

Mr. BRIDENSTINE. Yes, sir.

Chairman SMITH. And that is simply so that I can say I want to thank you for offering the amendment, and I recommend it to my colleagues. It adds to the piece of legislation.

Mr. BRIDENSTINE. Thank you, Mr. Chairman.

Chairman SMITH. Are there other Members who want to be recognized? The gentlewoman from Texas, Ms. Johnson.

Ms. JOHNSON. I just want to support that. I think we need that information, and I appreciate you bringing it forward.

Chairman SMITH.

The question is on agreeing to the amendment.

All in favor, say aye.

All opposed, say nay.

The ayes have it, and the amendment is agreed to.

We will now go to our last amendment, and it's going to be an amendment offered by the gentleman from Colorado, Mr. Perlmutter. I can see his hand, and he is recognized. The gentleman is recognized for 5 minutes, and the clerk will report the amendment.

The CLERK. Amendment to H.R. 2809 offered by Mr. Perlmutter of Colorado, amendment #010.

Chairman SMITH. Without objection, the amendment will be considered as read, and the gentleman is recognized to explain his amendment.

Mr. PERLMUTTER. Sure. Under the bill, there is a Committee, Private Space Activity Advisory Committee, that's constituted and it has among its duties a variety of things. What this amendment does at page 27, line 12, it adds the Committee is supposed to also consider our aerospace industry's access to adequate, predictable and reliable ratio frequency spectrum, so to just make sure that spectrum is available to the aerospace industry, and that's all the amendment does, and with that, I yield back.

Chairman SMITH. Has the gentleman yielded back?

Mr. PERLMUTTER. I did.

Chairman SMITH. OK. Thank you for the amendment. I'll recognize myself simply to say I support the amendment and urge my colleagues to support it as well.

Is there any further discussion on the amendment?

If not, all in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

We're going to go to final passage. Before he leaves the room, at the risk of hurting him back home, I do want to thank Perlmutter for substantially improving the legislation, and—but honestly and seriously, this is a good bipartisan piece of legislation, and we've had others dealing with space. It is a wonderful subject for us to be excited about and that will inspire others as well.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 2809 to the House as amended with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 2809 to the House as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the Motion to Reconsider is laid upon the table. H.R. 2809 is ordered reported to the House.

I ask unanimous consent that staff authorized to make any necessary technical and conforming changes. Without objection, so ordered.

Thank you all. This was great attendance today. I appreciate everybody's input, and the gentlewoman from Texas, the Ranking Member, is recognized.

Ms. JOHNSON. Mr. Chairman, this is not intended to be a goodbye to Mr. Perlmutter.

Chairman SMITH. We stand adjourned. Thank you, all.

[Whereupon, at 2:38 p.m., the Committee was adjourned.]

Appendix:

H.R. 2809, Amendment Roster

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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To amend title 51, United States Code, to provide for the authorization and supervision of nongovernmental space activities, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To amend title 51, United States Code, to provide for the authorization and supervision of nongovernmental space activities, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

4 This Act may be cited as the "American Space Com-
5 merce Free Enterprise Act of 2017".

Sec. 1. Short title; table of contents.
Sec. 2. Findings; policy; purposes.
Sec. 3. Certificates to operate space objects.
Sec. 4. Permitting of space-based remote sensing systems.
Sec. 5. Administrative provisions related to certification and permitting.
Sec. 6. Technical and conforming amendments.

Sec. 7. Office of Space Commerce.
Sec. 8. Restriction on preventing launches and reentries of certified space objects.
Sec. 9. Report on registration of space objects.

1 **SEC. 2. FINDINGS; POLICY; PURPOSES.**

2 (a) FINDINGS.—Congress finds the following:

3 (1) The United States, through existing author-
4 ization and supervision mechanisms, satisfies and is
5 in conformity with its obligation under the Outer
6 Space Treaty to authorize and supervise nongovern-
7 mental space activities to assure such activities are
8 carried out in conformity with the international obli-
9 gations of the United States under the Outer Space
10 Treaty.

11 (2) The United States has a robust and innova-
12 tive private sector that is investing in, developing,
13 and placing into outer space, spacecraft and pay-
14 loads.

15 (3) Authorization and supervision mechanisms
16 as of the date of enactment of this Act could be im-
17 proved to relieve administrative burdens on new and
18 innovative nongovernmental space actors.

19 (4) It serves the national interest to address
20 misperceptions of legal uncertainty through the es-
21 tablishment of a general authorization and super-
22 vision certification authority for nongovernmental
23 outer space activities.

1 (5) The private exploration and use of outer
2 space by nongovernmental entities will further the
3 national security, foreign policy, and economic inter-
4 ests of the United States.
5 (b) POLICY.—It is the policy of the United States
6 that—
7 (1) United States citizens and entities are free
8 to explore and use space, including the utilization of
9 outer space and resources contained therein, without
10 conditions or limitations;
11 (2) this freedom is only to be limited when nec-
12 essary to assure United States national security in-
13 terests are met and to authorize and supervise non-
14 governmental space activities to assure such activi-
15 ties are carried out in conformity with the inter-
16 national obligations of the United States under the
17 Outer Space Treaty;
18 (3) to the maximum extent practicable, the
19 Federal Government shall interpret and fulfill its
20 international obligations to minimize regulations and
21 limitations on the freedom of United States non-
22 governmental entities to explore and use space;
23 (4) to the maximum extent practicable, the
24 Federal Government shall take steps to protect the
25 physical safety of space objects operated by the

1 United States that do not involve limitations on the
2 freedoms of nongovernmental entities of the United
3 States; and
4 (5) nongovernmental activities in outer space
5 shall only be authorized and supervised in a trans-
6 parent, timely, and predictable manner, with mini-
7 mal costs and burdens placed on the entities author-
8 ized and supervised.
9 (c) PURPOSES.—The purposes of this Act and the
10 amendments made by this Act are—
11 (1) to enhance the existing outer space author-
12 ization and supervision framework to provide greater
13 transparency, greater efficiency, and less administra-
14 tive burden for nongovernmental entities of the
15 United States seeking to conduct space activities;
16 and
17 (2) to ensure that the United States remains
18 the world leader in commercial space activities.
19 (d) DEFINITIONS.—In this Act—
20 (1) the term "Agreement on the Rescue of As-
21 tronauts and the Return of Space Objects" means
22 the Agreement on the Rescue of Astronauts, the Re-
23 turn of Astronauts and the Return of Objects
24 Launched into Outer Space (signed at Washington,
25 Moscow, and London on April 22, 1968, ratified by

1 the United States on December 3, 1968; 19 UST
2 7570);
3 (2) the term "Convention on Registration of
4 Space Objects" means the Convention on Registra-
5 tion of Objects Launched into Outer Space (signed
6 at New York on January 14, 1975, ratified by the
7 United States on September 15, 1976; 28 UST
8 695);
9 (3) the term "covered treaties on outer space"
10 means—
11 (A) the Outer Space Treaty;
12 (B) the Agreement on the Rescue of Astro-
13 nauts and the Return of Space Objects;
14 (C) the Convention on Registration of
15 Space Objects; and
16 (D) the Liability Convention;
17 (4) the term "Liability Convention" means the
18 Convention on the International Liability for Dam-
19 age Caused by Space Objects (signed at Washington,
20 Moscow, and London on March 29, 1972, ratified by
21 the United States on October 9, 1973; 24 UST
22 2389); and
23 (5) the term "Outer Space Treaty" means the
24 Treaty on Principles Governing the Activities of
25 States in the Exploration and Use of Outer Space,

1 including the Moon and Other Celestial Bodies
2 (signed at Washington, Moscow, and London on
3 January 27, 1967, ratified by the United States on
4 October 10, 1967; 18 UST 2410).

5 **SEC. 3. CERTIFICATES TO OPERATE SPACE OBJECTS.**

6 Title 51, United States Code, is amended by adding
7 at the end the following:

8 "Subtitle VIII—Authorization and 9 Supervision of Nongovern- 10 mental Space Activities

11 "CHAPTER 801—CERTIFICATION TO 12 OPERATE SPACE OBJECTS

"Sec.
"80101. Definitions.
"80102. Certification authority.
"80103. Certification application and requirements.
"80104. Mitigation of space debris.
"80105. Continuing certification requirements.
"80106. Certification transfer.
"80107. Certification expiration and termination.
"80108. Existing license or pending application for launch or reentry.
"80109. Private Space Activity Advisory Committee.
"80110. Exemptions.
"80111. Protecting the interests of United States entity space objects.

13 "§ 80101. Definitions

14 "In this subtitle:

15 "(1) AGENCY.—The term 'agency' has the
16 meaning given the term Executive Agency in section
17 105 of title 5.

18 "(2) AGREEMENT ON THE RESCUE OF ASTRO-
19 NAUTS AND THE RETURN OF SPACE OBJECTS.—The

1 term 'Agreement on the Rescue of Astronauts and
2 the Return of Space Objects' means the Agreement
3 on the Rescue of Astronauts, the Return of Astro-
4 nauts and the Return of Objects Launched into
5 Outer Space (signed at Washington, Moscow, and
6 London on April 22, 1968, ratified by the United
7 States on December 3, 1968; 19 UST 7570).
8 "(3) CONVENTION ON REGISTRATION OF SPACE
9 OBJECTS.—The term 'Convention on Registration of
10 Space Objects' means the Convention on Registra-
11 tion of Objects Launched into Outer Space (signed
12 at New York on January 14, 1975, ratified by the
13 United States on September 15, 1976; 28 UST
14 695).
15 "(4) COVERED TREATIES ON OUTER SPACE.—
16 The term 'covered treaties on outer space' means—
17 "(A) the Outer Space Treaty;
18 "(B) the Agreement on the Rescue of As-
19 tronauts and the Return of Space Objects;
20 "(C) the Convention on Registration of
21 Space Objects; and
22 "(D) the Liability Convention.
23 "(5) LIABILITY CONVENTION.—The term 'Li-
24 ability Convention' means the Convention on the
25 International Liability for Damage Caused by Space

1 Objects (signed at Washington, Moscow, and Lon-
2 don on March 29, 1972, ratified by the United
3 States on October 9, 1973; 24 UST 2389).
4 "(6) NATIONAL OF THE UNITED STATES.—The
5 term 'national of the United States' has the meaning
6 given such term in section 101(a) of the Immigra-
7 tion and Nationality Act (8 U.S.C. 1101(a)).
8 "(7) OUTER SPACE TREATY.—The term 'Outer
9 Space Treaty' means the Treaty on Principles Gov-
10 erning the Activities of States in the Exploration
11 and Use of Outer Space, including the Moon and
12 Other Celestial Bodies (signed at Washington, Mos-
13 cow, and London on January 27, 1967, ratified by
14 the United States on October 10, 1967; 18 UST
15 2410).
16 "(8) SECRETARY.—The term 'Secretary'
17 means, except as otherwise provided in this subtitle,
18 the Secretary of Commerce, acting through the Of-
19 fice of Space Commerce.
20 "(9) SPACE-BASED REMOTE SENSING SYS-
21 TEM.—The term 'space-based remote sensing sys-
22 tem' means a space object in Earth orbit that is—
23 "(A) designed to image the Earth; or

1 "(B) capable of imaging a space object in
2 Earth orbit operated by the Federal Govern-
3 ment.
4 "(10) SPACE DEBRIS MITIGATION.—The term
5 'space debris mitigation' means efforts to—
6 "(A) prevent on-orbit break-ups;
7 "(B) remove spacecraft that have reached
8 the end of their mission operation from useful
9 densely populated orbit regions; and
10 "(C) limit the amount of debris released
11 during normal operations of a space object.
12 "(11) SPACE OBJECT.—
13 "(A) IN GENERAL.—The term 'space ob-
14 ject' means—
15 "(i) a human-made object located in
16 outer space, including on the Moon and
17 other celestial bodies, with or without
18 human occupants, that was launched from
19 Earth, such as a satellite or a spacecraft,
20 including component parts of the object;
21 and
22 "(ii) all items carried on such object
23 that are intended for use in outer space
24 outside of, and independent of, the oper-
25 ation of such object.

1 "(B) INCLUSION.—Such term includes any
2 human-made object that is—
3 "(i) manufactured or assembled in
4 outer space; and
5 "(ii) intended for operations in outer
6 space outside of, and independent of, the
7 operations of such object in which the
8 manufacturing or assembly occurred.
9 "(C) EXCLUSIONS.—Such term does not
10 include—
11 "(i) an article on board a space object
12 that is only intended for use inside the
13 space object;
14 "(ii) an article manufactured or proc-
15 essed in outer space that is a material; or
16 "(iii) an article intended for use out-
17 side of a space object as part of the cer-
18 tified operations of the space object.
19 "(12) STATE.—The term 'State' means each of
20 the several States of the United States, the District
21 of Columbia, the Commonwealth of Puerto Rico, the
22 United States Virgin Islands, Guam, American
23 Samoa, the Commonwealth of the Northern Mariana
24 Islands, and any other commonwealth, territory, or
25 possession of the United States.

1 "(13) UNITED STATES.—The term 'United
2 States' means the States, collectively.
3 "(14) UNITED STATES ENTITY.—The term
4 'United States entity' means—
5 "(A) an individual who is a national of the
6 United States; or
7 "(B) a nongovernmental entity organized
8 or existing under, and subject to, the laws of
9 the United States or a State.

10 **"§ 80102. Certification authority**

11 "(a) IN GENERAL.—Not later than 1 year after the
12 date of enactment of the American Space Commerce Free
13 Enterprise Act of 2017, the Secretary shall issue a certifi-
14 cation for the operation of a space object to any United
15 States entity who submits an application for a certification
16 in satisfaction of the requirements of this chapter.
17 "(b) CONSULTATION.—The Secretary may, as the
18 Secretary considers necessary, consult with the heads of
19 other relevant agencies in carrying out the requirements
20 of this chapter, pursuant to section 80311.
21 "(c) CERTIFICATION REQUIRED FOR OPERATION.—
22 Beginning on the date that is 1 year after the date of
23 enactment of the American Space Commerce Free Enter-
24 prise Act of 2017, a United States entity may not operate
25 a space object unless the entity holds a certification issued

1 under this chapter for the operation of such object or the
2 entity holds a valid payload approval for launch or reentry
3 under section 50904 as part of a license issued under
4 chapter 509, and that satisfies the requirements of section
5 80108(a).

6 "(d) FOREIGN ENTITIES PROHIBITED.—The Sec-
7 retary may not issue a certification under this chapter to
8 any person who is not a United States entity.

9 "(e) COVERAGE OF CERTIFICATION.—The Secretary
10 shall, to the maximum extent practicable, require only 1
11 certification under this chapter for a United States entity
12 to—

13 "(1) conduct multiple operations carried out
14 using a single space object;

15 "(2) operate multiple space objects that carry
16 out substantially similar operations; or

17 "(3) use multiple space objects to carry out a
18 single space operation.

19 **"§ 80103. Certification application and requirements**

20 "(a) APPLICATION PROCESS.—

21 "(1) IN GENERAL.—To be eligible for a certifi-
22 cation or transfer of a certification to operate a
23 space object under this chapter, a United States en-
24 tity shall submit an application to the Secretary as
25 provided in paragraph (2). Such application shall in-

1 clude, for each required item or attestation, suffi-
2 cient evidence to demonstrate each fact or assertion.
3 "(2) CONTENTS.—An application described in
4 paragraph (1) shall include only the following infor-
5 mation, with respect to each space object and the
6 operations proposed to be certified:
7 "(A) The name, address, and contact in-
8 formation of one or more nationals of the
9 United States designated by the applicant as
10 responsible for the operation of the space ob-
11 ject.
12 "(B) An affirmation, and a document of
13 proof, that the applicant is a United States en-
14 tity.
15 "(C) If available at the time of submission
16 of the application, the planned date and loca-
17 tion of the launch of the space object, including
18 the identity of the launch provider.
19 "(D) The general physical form and com-
20 position of the space object.
21 "(E) A description of the proposed oper-
22 ations of the space object that includes—
23 "(i) when and where the space object
24 will operate; and

1 "(ii) when and where the operation of
2 the space object will terminate.
3 "(F) A description of how the space object
4 will be operated and disposed of in a manner to
5 mitigate the generation of space debris.
6 "(G) Information about third-party liabil-
7 ity insurance obtained, if any, by the applicant
8 for operations of the space object, including the
9 amount and coverage of such liability insurance.
10 "(H) Whether the space object will include
11 a space-based remote sensing system.
12 "(3) ATTESTATIONS.—An application described
13 in paragraph (1) shall contain an attestation by the
14 applicant of each the following:
15 "(A) The space object is not a nuclear
16 weapon or a weapon of mass destruction.
17 "(B) The space object will not carry a nu-
18 clear weapon or weapon of mass destruction.
19 "(C) The space object will not be operated
20 or used for testing of any weapon on a celestial
21 body.
22 "(D) All information in the application and
23 supporting documents is true, complete, and ac-
24 curate.
25 "(b) REVIEW OF APPLICATION.—

1 "(1) VERIFICATION OF INFORMATION AND AT-
2 TESTATIONS.—Not later than 60 days after receipt
3 of an application under this section, the Secretary
4 shall verify that—
5 "(A) the application is complete, including
6 any required supporting documents;
7 "(B) the application does not contain any
8 clear indication of fraud or falsification; and
9 "(C) the application contains each attesta-
10 tion required under subsection (a)(3).
11 "(2) DETERMINATION.—Not later than 60 days
12 after receipt of an application under this section—
13 "(A) if the Secretary verifies that the ap-
14 plicant has met the application requirements
15 described in paragraph (1), the Secretary shall
16 approve the application and issue a certification
17 to the applicant with or without conditions on
18 the proposed operation of the space object pur-
19 suant to subsection (c)(1)(A); or
20 "(B) if the Secretary cannot verify that
21 the applicant has met the application require-
22 ments described in paragraph (1) or if the Sec-
23 retary determines it is necessary to deny the
24 application pursuant to subsection (c)(1)(B),
25 the Secretary—

"(i) shall issue a denial of the application signed by the Secretary (a duty that may not be delegated, including to the Office of Space Commerce); and

"(ii) shall, not later than 10 days after the decision to deny the certification—

"(I) provide the applicant with a written notification containing a clearly articulated rationale for the denial that provides, to the maximum extent practicable, guidance to the applicant as to how such rationale for denial could be addressed in a subsequent application; and

"(II) notify the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives of such rationale.

"(3) AUTOMATIC APPROVAL.—If the Secretary has not approved or denied the application before the deadline under paragraph (2), the certification shall be approved without condition. The Secretary

1 may not allow tolling of the 60 day period under
2 such paragraph.
3 "(4) IMPROPER BASIS FOR DENIAL.—The Sec-
4 retary may not deny an application for a certifi-
5 cation under this section in order to protect an exist-
6 ing certification holder from competition.
7 "(5) SUBSEQUENT REVIEW.—The Secretary
8 may not prejudice a new application for the pro-
9 posed operations denied pursuant to paragraph
10 (2)(B) if such new application contains remedies ad-
11 dressing the rationale for such denial.
12 "(c) COMPLIANCE WITH THE OUTER SPACE TREA-
13 TY.—
14 "(1) IN GENERAL.—If the Secretary deter-
15 mines, with clear and convincing evidence, that the
16 proposed operation of a space object under an appli-
17 cation for a certification under this chapter is a vio-
18 lation of an international obligation of the United
19 States pertaining to a nongovernmental entity of the
20 United States under the Outer Space Treaty—
21 "(A) the Secretary may condition the pro-
22 posed operation covered by the certification only
23 to the extent necessary to prevent a violation of
24 such international obligation; or

1 "(B) if the Secretary determines that there
2 is no practicable way to condition such certifi-
3 cation to prevent such a violation, the Secretary
4 may deny the application.
5 "(2) LIMITATION FOR DETERMINATIONS.—A
6 determination under paragraph (1) shall be limited
7 as follows:
8 "(A) The Federal Government shall inter-
9 pret and fulfill its international obligations
10 under the Outer Space Treaty in a manner that
11 minimizes regulations and limitations on the
12 freedom of United States nongovernmental enti-
13 ties to explore and use space.
14 "(B) The Federal Government shall inter-
15 pret and fulfill its international obligations
16 under the Outer Space Treaty in a manner that
17 promotes free enterprise in outer space.
18 "(C) The Federal Government shall not
19 presume all obligations of the United States
20 under the Outer Space Treaty are obligations to
21 be imputed upon United States nongovern-
22 mental entities.
23 "(D) Guidelines promulgated by the Com-
24 mittee on Space Research may not be consid-

1 ered international obligations of the United
2 States.
3 "(3) PRESUMPTIONS.—In making a determina-
4 tion under paragraph (1), the Secretary shall pre-
5 sume, absent clear and convincing evidence to the
6 contrary, that—
7 "(A) any attestation made by an applicant
8 pursuant to subsection (a)(3) is sufficient to
9 meet the international obligations of the United
10 States pertaining to nongovernmental entities of
11 the United States under the Outer Space Trea-
12 ty addressed by such attestation; and
13 "(B) reasonably commercially available ef-
14 forts are sufficient to be in conformity with the
15 international obligations of the United States
16 pertaining to nongovernmental entities of the
17 United States under the Outer Space Treaty.
18 "(4) PROHIBITION ON RETROACTIVE CONDI-
19 TIONS.—No other modifications may be made, or
20 additional conditions placed, on a certification after
21 the date on which the certification is issued (except
22 to account for a material change as provided in sec-
23 tion 80105(c) or the removal of a condition pursuant
24 to subsection (d)).

1 "(5) NONDELEGABLE.—The responsibilities of
2 the Secretary under this subsection may not be dele-
3 gated, including to the Office of Space Commerce.
4 "(d) AUTHORITY TO REMOVE CONDITIONS.—The
5 Secretary, as determined appropriate, may remove a con-
6 dition placed on a certification pursuant to subsection (c).
7 **"§ 80104. Mitigation of space debris**
8 "(a) PLAN SUBMISSION.—To be eligible for a certifi-
9 cation under this chapter, each application shall include
10 a space debris mitigation plan for the space object. Such
11 plan—
12 "(1) shall take into account best practice guide-
13 lines promulgated by the United States and the
14 Interagency Debris Coordinating Committee; and
15 "(2) may take into account that a space object
16 may end certified operations and be stored in a safe
17 manner until such time as the space object is perma-
18 nently disposed of or certified for further operations.
19 "(b) IMPLEMENTATION.—To the maximum extent
20 practicable, a holder of a certification under this chapter
21 shall notify the Secretary not later than 30 days before
22 beginning to implement the disposal phase of a space de-
23 bris mitigation plan described in subsection (a). Such cer-
24 tification holder shall, not later than 30 days after com-

1 pleting implementation of such phase, update the Sec-
2 retary of the results of any space debris mitigation efforts.
3 **"§ 80105. Continuing certification requirements**
4 "(a) NOTIFICATION REQUIREMENT.—A certification
5 holder shall, in a timely manner, notify the Secretary if—
6 "(1) a certified space object has terminated op-
7 erations; or
8 "(2) a catastrophic event has occurred to a cer-
9 tified space object, such as the unplanned destruc-
10 tion of a space object.
11 "(b) MATERIAL CHANGE.—The Secretary shall re-
12 quire certification holders to inform the Secretary of—
13 "(1) any material changes to the space object
14 or the planned operations of the space object prior
15 to launch; and
16 "(2) any material anomalies or departures from
17 the planned operations during the course of oper-
18 ations.
19 "(c) UPDATE TO CERTIFICATION.—Not later than 14
20 days after the date of receipt of information regarding a
21 material change pursuant to subsection (b), the Secretary
22 shall make a determination of whether such material
23 change is substantial enough to warrant additional review
24 under section 80103(b). Not later than 60 days after a
25 determination that such review is warranted, the Secretary

1 shall complete a similar such review process for such mate-
2 rial change as is required for a certification applicant
3 under such section.

4 **"§ 80106. Certification transfer**

5 "(a) IN GENERAL.—Subject to subsections (b) and
6 (c), the Secretary shall provide for the transfer of a certifi-
7 cation under this chapter from the certification holder to
8 another United States entity to continue the operations
9 allowed under such certification.

10 "(b) TRANSFER REQUEST REQUIREMENTS.—To be
11 eligible for a transfer under subsection (a), the certifi-
12 cation holder shall submit to the Secretary a request that
13 includes—

14 "(1) any identifying information regarding the
15 proposed transferee, including accompanying sup-
16 porting documents, that would be required under an
17 initial application under section 80103; and

18 "(2) each attestation required under section
19 80103(a)(3), including accompanying supporting
20 documents, completed by the proposed transferee.

21 "(c) DETERMINATION.—Not later than 60 days after
22 a certification holder submits a request under subsection
23 (b), the Secretary shall complete a similar review process
24 for the request for transfer as required for a certification
25 applicant under section 80103(b).

1 **"§ 80107. Certification expiration and termination**

2 "(a) CERTIFICATION EXPIRATION.—

3 "(1) IN GENERAL.—A certification issued under
4 this chapter shall expire on the earlier of—

5 "(A) the date on which all operations ap-
6 proved under such certification cease, including
7 carrying out a space debris mitigation plan of
8 any space object approved under such certifi-
9 cation;

10 "(B) the date on which all space objects
11 approved under the certification no longer exist;
12 or

13 "(C) the date that is 5 years after the date
14 on which the certification was approved, if no
15 operations approved under the certification have
16 commenced by such date.

17 "(b) CERTIFICATION TERMINATION.—

18 "(1) IN GENERAL.—The Secretary shall termi-
19 nate a certification under this chapter if an appli-
20 cant or certification holder is convicted of a violation
21 of section 1001 of title 18 related to the certification
22 process under this chapter.

23 "(2) ELIGIBILITY.—A certification holder
24 whose certification is terminated under this sub-
25 section shall be ineligible to apply for or receive a
26 certification under this chapter.

1 "(3) SPACE DEBRIS MITIGATION PLAN.—Upon
2 termination of a certification under paragraph (1),
3 the Secretary may require the certification holder to
4 carry out the space debris mitigation plan submitted
5 by the certification holder under section 80104.

6 **"§ 80108. Existing license or pending application for**
7 **launch or reentry**

8 "(a) CONTINUATION OF EXISTING LICENSE.—Any
9 United States entity for whom a payload has been ap-
10 proved (and not subject to an exemption under section
11 80110) on or before the effective date of this section for
12 launch or reentry under section 50904 as part of a license
13 issued under chapter 509 may—

14 "(1) elect to be immediately considered certified
15 for operation under this chapter on such effective
16 date, in which case all terms and conditions applica-
17 ble to the payload as approved for launch or reentry
18 as part of a license issued under chapter 509 shall
19 apply for the duration of the operation of the pay-
20 load; or

21 "(2) apply for a certification under this chapter
22 for the operation of the licensed activities and may
23 continue to operate pursuant to such license until
24 such time as such certification is issued.

1 "(b) RESCINDING OR TRANSFER OF PENDING LI-
2 CENSE.—A payload of a United States entity that, on the
3 effective date of this section, is pending approval under
4 section 50904 as part of a launch or reentry license issued
5 under chapter 509 may be, at the election of the applicant
6 for payload approval—
7 "(1) rescinded without prejudice; or
8 "(2) transferred to the Office of Space Com-
9 merce and deemed to be a pending application for
10 certification under this chapter.
11 "(c) EFFECTIVE DATE.—This section shall take ef-
12 fect on the date that is 1 year after the date of enactment
13 of the American Space Commerce Free Enterprise Act of
14 2017.
15 **"§ 80109. Private Space Activity Advisory Committee**
16 "(a) ESTABLISHMENT.—The Secretary shall estab-
17 lish a Private Space Activity Advisory Committee (in this
18 section referred to as the 'Committee') consisting of 15
19 members who shall be appointed by the Secretary.
20 "(b) CHAIR.—The Committee shall designate one
21 member as the chair of the Committee.
22 "(c) MEMBERSHIP.—
23 "(1) LIMITATION.—Members of the Committee
24 may not be Federal Government employees or offi-
25 cials.

1 "(2) TRAVEL EXPENSES.—Members of the
2 Committee shall receive travel expenses, including
3 per diem in lieu of subsistence, in accordance with
4 the applicable provisions under subchapter I of chap-
5 ter 57 of title 5.
6 "(3) QUALIFICATIONS.—Members of the Com-
7 mittee shall include a variety of space policy, engi-
8 neering, technical, science, legal, and finance profes-
9 sionals. Not less than 3 members shall have signifi-
10 cant experience working in the commercial space in-
11 dustry.
12 "(d) TERMS.—Each member of the Committee shall
13 serve for a term of 4 years and may not serve as a member
14 for the 2-year period following the date of completion of
15 each such term.
16 "(e) DUTIES.—The duties of the Committee shall be
17 to—
18 "(1) analyze the status and recent develop-
19 ments of nongovernmental space activities;
20 "(2) analyze the effectiveness and efficiency of
21 the implementation of the certification process under
22 this chapter;
23 "(3) provide recommendations to the Secretary
24 and Congress on how the United States can facili-
25 tate and promote a robust and innovative private

1 sector that is investing in, developing, and operating
2 space objects;
3 "(4) identify any challenges the United States
4 private sector is experiencing—
5 "(A) with the authorization and super-
6 vision of the operation of space objects under
7 this chapter;
8 "(B) more generally, with international ob-
9 ligations of the United States relevant to pri-
10 vate sector activities in outer space; and
11 "(C) with harmful interference to private
12 sector activities in outer space;
13 "(5) review existing best practices for United
14 States entities to avoid the harmful contamination of
15 the Moon and other celestial bodies;
16 "(6) review existing best practices for United
17 States entities to avoid adverse changes in the envi-
18 ronment of the Earth resulting from the introduc-
19 tion of extraterrestrial matter;
20 "(7) provide information, advice, and rec-
21 ommendations on matters relating to United States
22 private sector activities in outer space; and
23 "(8) provide information, advice, and rec-
24 ommendations on matters related to the authority of
25 the Secretary under this chapter or to private sector

1 space activities authorized pursuant to this chapter
2 that the Committee determines necessary.
3 "(f) ANNUAL REPORT.—The Committee shall submit
4 to Congress, the President, and the Secretary an annual
5 report that includes the information, analysis, findings,
6 and recommendations described in subsection (e).
7 "(g) SUNSET.—The Committee shall terminate on
8 the date that is 10 years after the date on which the Com-
9 mittee is established.
10 **"§ 80110. Exemptions**
11 "(a) IN GENERAL.—A certification is not required
12 under this chapter for any of the following operations:
13 "(1) Space object activities authorized by an-
14 other country that is a party to the Outer Space
15 Treaty.
16 "(2) Launch or reentry vehicle operations li-
17 censed by the Department of Transportation under
18 chapter 509.
19 "(3) Space stations licensed by the Federal
20 Communications Commission under the Communica-
21 tions Act of 1934 (47 U.S.C. 151 et seq.).
22 "(b) RULE OF CONSTRUCTION.—Nothing in this sec-
23 tion shall be construed to exempt any entity from the re-
24 quirement to obtain a permit to operate a space-based re-
25 mote sensing system under chapter 802.

1 **"§ 80111. Protecting the interests of United States en-**
2 **tity space objects**

3 "The President shall ensure that United States entity
4 exploration and use of outer space, including commercial
5 activity and the exploitation of space resources, is secure
6 from acts of foreign aggression and foreign harmful inter-
7 ference and is given due regard, and the President shall
8 uphold the ownership rights of space objects of United
9 States entities. Space objects certified under this chapter
10 shall receive the full protection of the United States.".

11 **SEC. 4. PERMITTING OF SPACE-BASED REMOTE SENSING**
12 **SYSTEMS.**

13 (a) FINDINGS.—Congress finds the following:

14 (1) The commercial market for space-based re-
15 mote sensing technologies and information has expe-
16 rienced significant growth since the passage of the
17 Land Remote Sensing Policy Act of 1992.

18 (2) It is in the interest of the United States to
19 foster new and novel space-based remote sensing ap-
20 plications and services and to help facilitate their
21 continued domestic growth.

22 (3) Since the passage of the Land Remote
23 Sensing Policy Act of 1992, the National Oceanic
24 and Atmospheric Administration's Office of Com-
25 mercial Remote Sensing has experienced a signifi-
26 cant increase in applications for private remote sens-

1 ing space system licenses as authorized under sec-
2 tion 60121 of title 51, United States Code.
3 (4) Many of the applicants for commercial
4 space-based remote sensing licenses have encoun-
5 tered significant delays and unnecessary obstacles in
6 the application process.
7 (5) The current licensing paradigm must be up-
8 dated as to not discourage the continued growth of
9 the United States space-based remote sensing indus-
10 try. It must be updated in a way that satisfies the
11 needs of commercial remote sensing market as well
12 as the national security of the United States.
13 (6) In order to protect United States leadership
14 and commercial viability in remote sensing tech-
15 nologies, the Federal Government should not limit
16 commercial entities from providing remote sensing
17 capabilities or data products that are available or
18 reasonably expected to be made available in the next
19 3 years in the international or domestic marketplace.
20 (b) POLICY.—It is the policy of the United States
21 that, to the maximum extent practicable, the Federal Gov-
22 ernment shall take steps to protect the national security
23 interests of the United States that do not involve regu-
24 lating or limiting the freedoms of United States non-
25 governmental entities to explore and use space. Federal

1 Government agencies shall mitigate any threat to national
2 security posed by the exploration and use of outer space
3 by United States citizens and entities, to the maximum
4 extent practicable, changing Federal Government activi-
5 ties and operations.

6 (c) AMENDMENT.—Title 51, United States Code, is
7 further amended by adding at the end the following:

8 **"CHAPTER 802—PERMITTING OF SPACE-**
9 **BASED REMOTE SENSING SYSTEMS**

"Sec.
"80201. Permitting authority.
"80202. Application for permit.
"80203. Continuing permitting requirements.
"80204. Permit transfer.
"80205. Agency activities.
"80206. Annual reports.
"80207. Advisory Committee on Commercial Remote Sensing.
"80208. Continuation of existing license or pending application.
"80209. Commercial Remote Sensing Regulatory Affairs Office.

10 **"§ 80201. Permitting authority**

11 "(a) IN GENERAL.—Not later than 1 year after the
12 date of enactment of the American Space Commerce Free
13 Enterprise Act of 2017, the Secretary is authorized to per-
14 mit persons to operate space-based remote sensing sys-
15 tems.

16 "(b) CONSULTATION.—The Secretary may, as the
17 Secretary considers necessary, consult with the heads of
18 other relevant agencies in carrying out the requirements
19 of this chapter, pursuant to section 80311.

1 "(c) LIMITATION WITH RESPECT TO SYSTEM USED
2 FOR OTHER PURPOSES.—In the case of a space object
3 that is used for remote sensing and other purposes, the
4 authority of the Secretary under this chapter shall be lim-
5 ited to the remote sensing operations of such space object.
6 "(d) DE MINIMIS EXCEPTION.—
7 "(1) WAIVER.—The Secretary may waive the
8 requirement for a permit for a space-based remote
9 sensing system that the Secretary determines is—
10 "(A) ancillary to the primary design pur-
11 pose of the space object; or
12 "(B) too trivial to require a determination
13 under section 80202(c) relating to national se-
14 curity.
15 "(2) GUIDANCE.—Not later than 1 year after
16 the date of enactment of this subsection, the Sec-
17 retary shall issue guidance providing a clear expla-
18 nation of the criteria used by the Secretary to grant
19 a de minimis waiver under paragraph (1)(B) for a
20 space-based remote sensing system that is too trivial
21 to require a determination under section 80202(c).
22 "(e) COVERAGE OF PERMIT.—The Secretary shall, to
23 the maximum extent practicable, ensure that only one per-
24 mit is required under this chapter to—

1 "(1) conduct multiple operations carried out
2 using a space-based remote sensing system;
3 "(2) operate multiple space-based remote sens-
4 ing systems that carry out substantially similar op-
5 erations; or
6 "(3) use multiple space-based remote sensing
7 systems to carry out a single remote sensing oper-
8 ation.
9 "(f) PROHIBITION ON OPERATION.—Not later than
10 1 year after the date of enactment of the American Space
11 Commerce Free Enterprise Act of 2017, no person may,
12 directly or through any subsidiary or affiliate, operate any
13 space-based remote sensing system without a permit
14 issued under this chapter.
15 "(g) RESPONSIBLE PARTY.—In any case in which the
16 applicant for a permit under this chapter is not a United
17 States entity, the applicant shall identify a United States
18 entity that consents to be responsible for the permitted
19 operation of the space-based remote sensing system.
20 "(h) OPERATION OF SPACE-BASED REMOTE SENSING
21 SYSTEM.—For purposes of this chapter, the operation of
22 a space-based remote sensing system—
23 "(1) begins when the system—
24 "(A) is located in outer space; and

1 "(B) can meet the minimum threshold and
2 objective capabilities for the system's stated
3 need; and
4 "(2) shall not cover the acts of distribution,
5 sale, or transfer of data, information, or services to
6 persons, foreign or domestic, including any such acts
7 taken pursuant to an agreement with such persons.
8 **"§ 80202. Application for permit**
9 "(a) APPLICATION PROCESS.—
10 "(1) IN GENERAL.—To receive a permit to op-
11 erate a space-based remote sensing system under
12 this chapter, a person shall submit an application to
13 the Secretary as provided in paragraph (2). Such
14 application shall include, for each required item, suf-
15 ficient evidence to demonstrate each fact or asser-
16 tion.
17 "(2) CONTENTS.—An application described in
18 paragraph (1) shall include only the following infor-
19 mation, with respect to each space-based remote
20 sensing system and the operations proposed to be
21 permitted:
22 "(A) The name, address, and contact in-
23 formation of one or more United States entity
24 identified by the applicant, pursuant to section

1 80201(g), as responsible for the operation of
2 the space-based remote sensing system.
3 "(B) If available at the time of submission
4 of the application, the planned date and loca-
5 tion of the launch of the applicable space object,
6 including the identity of the launch provider.
7 "(C) The general physical form and com-
8 position of the space-based remote sensing sys-
9 tem.
10 "(D) A description of the proposed oper-
11 ations of the space-based remote sensing system
12 that includes—
13 "(i) when and where the space-based
14 remote sensing system will operate;
15 "(ii) when and where the operation of
16 the space-based remote sensing system will
17 terminate; and
18 "(iii) any additional information nec-
19 essary to make a determination under sub-
20 section (c) regarding a significant threat to
21 national security, as prescribed in advance
22 in regulation by the Secretary.
23 "(E) A description of how the space-based
24 remote sensing system will be operated and dis-

1 posed of in a manner to mitigate the generation
2 of space debris.
3 "(F) Information about third-party liabil-
4 ity insurance obtained, if any, by the applicant
5 for operations of the space-based remote sens-
6 ing system, including the amount and coverage
7 of such liability insurance.
8 "(b) REVIEW OF APPLICATION.—
9 "(1) VERIFICATIONS.—Not later than 60 days
10 after receipt of an application under this section, the
11 Secretary shall verify that—
12 "(A) the application is complete pursuant
13 to subsection (a); and
14 "(B) the application does not contain any
15 clear indication of fraud or falsification.
16 "(2) DETERMINATION.—Not later than 60 days
17 after receipt of an application under this section—
18 "(A) if the Secretary verifies that the ap-
19 plicant has met the application requirements
20 described in paragraph (1), the Secretary shall
21 approve the application and issue a permit to
22 the applicant with or without conditions on the
23 proposed operation of the space-based remote
24 sensing system pursuant to subsection
25 (c)(1)(A); or

"(B) if the Secretary cannot verify that the applicant has met the application requirements described in paragraph (1) or if the Secretary makes a determination to deny the application under subsection (c)(1)(B), the Secretary—

"(i) shall issue a denial of the application signed by the Secretary (a duty that may not be delegated, including to the Office of Space Commerce); and

"(ii) shall, not later than 10 days after the decision to deny the application—

"(I) provide the applicant with a written notification containing a clearly articulated rationale for the denial that, to the maximum extent practicable—

"(aa) provides guidance to the applicant as to how the articulated rationale for denial could be addressed in a subsequent application; and

"(bb) includes all classified information included in such rationale for which the applicant

1 has the required security clear-
2 ance; and
3 "(II) submit a notification of the
4 denial to the Committee on Com-
5 merce, Science, and Transportation of
6 the Senate and the Committee on
7 Science, Space, and Technology of the
8 House of Representatives that—
9 "(aa) contains the clearly
10 articulated rationale for the de-
11 nial; and
12 "(bb) in the case of a denial
13 pursuant to a national security
14 determination under subsection
15 (c)—
16 "(AA) includes an ex-
17 planation of how, and clear
18 and convincing evidence
19 that, to the maximum extent
20 practicable, the Federal
21 Government took steps to
22 mitigate a significant threat
23 to the national security of
24 the United States posed by
25 the operation of the appli-

1 cant's space-based remote
2 sensing system by changing
3 Federal Government activi-
4 ties and operations; and
5 "(BB) may contain
6 classified information.
7 "(3) AUTOMATIC APPROVAL.—If the Secretary
8 has not approved or denied the application before
9 the deadline under paragraph (2), the application
10 shall be approved without condition. The Secretary
11 may not allow tolling of the 60 day period under
12 such paragraph.
13 "(4) IMPROPER BASIS FOR DENIAL.—The Sec-
14 retary may not deny an application for a permit
15 under this section in order to protect an existing
16 permit holder from competition.
17 "(5) SUBSEQUENT REVIEW.—The Secretary
18 may not prejudice a new application for the pro-
19 posed operations denied pursuant to paragraph
20 (2)(B) if such new application contains remedies ad-
21 dressing the rationale for such denial.
22 "(c) ADDRESSING NATIONAL SECURITY THREAT.—
23 "(1) IN GENERAL.—If the Secretary deter-
24 mines, with clear and convincing evidence, that the
25 proposed operation of a space-based remote sensing

1 system under an application for a permit under this
2 chapter poses a significant threat to the national se-
3 curity of the United States as provided in paragraph
4 (2)—
5 "(A) the Secretary may condition the pro-
6 posed operation covered by the permit only to
7 the extent necessary to address such threat; or
8 "(B) if the Secretary determines that there
9 is no practicable way to condition such permit
10 to address such threat, the Secretary may deny
11 the application.
12 "(2) SIGNIFICANT THREAT TO NATIONAL SECU-
13 RITY.—For purposes of a determination under para-
14 graph (1), a significant threat to the national secu-
15 rity of the United States is a threat—
16 "(A) that is imminent; and
17 "(B) that cannot practicably be mitigated
18 through changes to Federal Government activi-
19 ties or operations.
20 "(3) REASONABLY COMMERCIALLY AVAILABLE
21 EFFORTS.—To the maximum extent practicable, the
22 Secretary shall only place a condition on a permit
23 that is achievable using reasonably commercially
24 available efforts.

1 "(4) NOTIFICATION.—Not later than 10 days
2 after the decision to condition the proposed oper-
3 ation covered by a permit pursuant to this sub-
4 section, the Secretary shall—
5 "(A) provide the applicant with a written
6 notification containing a clearly articulated ra-
7 tionale for the condition that, to the maximum
8 extent practicable—
9 "(i) provides guidance to the applicant
10 as to how the articulated rationale for con-
11 dition could be addressed in a subsequent
12 application; and
13 "(ii) includes all classified information
14 included in such rationale for which the
15 applicant has the required security clear-
16 ance; and
17 "(B) submit a notification of the condition
18 to the Committee on Commerce, Science, and
19 Transportation of the Senate and the Com-
20 mittee on Science, Space, and Technology of
21 the House of Representatives that—
22 "(i) contains the clearly articulated
23 rationale for the condition;
24 "(ii) includes an explanation of how,
25 and clear and convincing evidence that, to

1 the maximum extent practicable, the Fed-
2 eral Government took steps to mitigate a
3 significant threat to the national security
4 of the United States posed by the oper-
5 ation of the applicant's space-based remote
6 sensing system by changing Federal gov-
7 ernment activities and operations; and
8 "(iii) may contain classified informa-
9 tion.
10 "(5) PROHIBITION ON RETROACTIVE CONDI-
11 TIONS.—No other modifications may be made, or
12 additional conditions placed, on a permit after the
13 date on which the permit is issued except to account
14 for a material change as provided in section
15 80203(c).
16 "(6) NONDELEGABLE.—The responsibilities of
17 the Secretary under this subsection may not be dele-
18 gated, including to the Office of Space Commerce.
19 "(d) LIMITATIONS ON CONDITIONS.—
20 "(1) SAME OR SIMILAR CAPABILITY.—No oper-
21 ational condition under subsection (c) may be placed
22 on a space-based remote sensing system that has the
23 same or substantially similar space-based remote
24 sensing capabilities as another system permitted
25 under this chapter with no such condition.

1 "(2) CONDITIONS THAT EXCEED PERMITTED
2 CONDITIONS.—The Secretary may not place a condi-
3 tion on a permit for a space-based remote sensing
4 system that exceeds a condition placed on an exist-
5 ing permitted system that has the same or substan-
6 tially similar capabilities.
7 "(e) COMMERCIALLY AVAILABLE CAPABILITY.—
8 "(1) EXCEPTION.—The Secretary may not deny
9 an application for, or place a condition on, a permit
10 for the operation of a space-based remote sensing
11 system for which the same or substantially similar
12 capabilities, derived data, products, or services are
13 already commercially available or reasonably ex-
14 pected to be made available in the next 3 years in
15 the international or domestic marketplace. The ex-
16 ception in the previous sentence applies regardless of
17 whether the marketplace products and services origi-
18 nate from the operation of aircraft, unmanned air-
19 craft, or other platforms or technical means or are
20 assimilated from a variety of data sources.
21 "(2) CLEAR AND CONVINCING EVIDENCE.—
22 Each denial of an application for, and each condition
23 placed on, a permit for the operation of a space-
24 based remote sensing system, shall include an expla-
25 nation of, and clear and convincing evidence that,

1 the exception under paragraph (1) does not apply
2 with respect to the proposed permitted operations of
3 such system.
4 "(3) DATABASE.—The President shall—
5 "(A) maintain a database of commercially
6 available capabilities described in paragraph
7 (1);
8 "(B) update such database not less than
9 once every 3 months; and
10 "(C) submit to the Committee on Com-
11 merce, Science, and Transportation of the Sen-
12 ate and the Committee on Science, Space, and
13 Technology of the House of Representatives a
14 report containing the contents of the database
15 upon each update required under subparagraph
16 (B).
17 "(4) APPLICANT SUBMISSIONS.—An applicant
18 for, or holder of, a permit for the operation of a
19 space-based remote sensing system may submit to
20 the Secretary evidence of, or information regarding,
21 a commercially available capability described in
22 paragraph (1) for consideration for inclusion in the
23 database.
24 "(5) NONAPPLICATION OF CONDITION.—In any
25 case in which the Secretary determines that the ex-

1 ception under paragraph (1) applies with respect to
2 a permit for the operation of a space-based remote
3 sensing system for which the Secretary has placed a
4 condition under subsection (c), such condition shall
5 no longer apply with respect to such permitted oper-
6 ations.

7 "(f) AUTHORITY TO REMOVE CONDITIONS.—Nothing
8 in this section shall be construed to prohibit the Secretary
9 from removing a condition placed on a permit pursuant
10 to subsection (c).

11 **"§ 80203. Continuing permitting requirements**

12 "(a) NOTIFICATION REQUIREMENT.—A permit hold-
13 er shall, in a timely manner, notify the Secretary if—

14 "(1) a permitted space-based remote sensing
15 system has terminated operations; or

16 "(2) a catastrophic event has occurred to a
17 space-based remote sensing system, such as the un-
18 planned destruction of such system.

19 "(b) MATERIAL CHANGE.—The Secretary shall re-
20 quire permit holders to inform the Secretary of—

21 "(1) any material changes to the space-based
22 remote sensing system or the planned operations of
23 such system prior to launch; and

1 "(2) any material anomalies or departures from
2 the planned operations during the course of oper-
3 ations.
4 "(c) UPDATE TO PERMIT.—Not later than 14 days
5 after the date of receipt of information regarding a mate-
6 rial change pursuant to subsection (b), the Secretary shall
7 make a determination of whether such material change is
8 substantial enough to warrant additional review under sec-
9 tion 80202(b). Not later than 60 days after a determina-
10 tion that such review is warranted, the Secretary shall
11 complete a similar such review process for such material
12 change as is required for a permit applicant under such
13 section.
14 **"§ 80204. Permit transfer**
15 "(a) IN GENERAL.—Subject to subsections (b) and
16 (c), the Secretary shall provide for the transfer of a permit
17 under this chapter from the permit holder to another per-
18 son to continue the operations allowed under such permit.
19 "(b) TRANSFER REQUEST REQUIREMENTS.—To be
20 eligible for a transfer under subsection (a), the permit
21 holder shall submit to the Secretary a request that in-
22 cludes any identifying information regarding the trans-
23 feree that would be required under an initial application
24 under section 80202.

1 "(c) DETERMINATION.—Not later than 14 days after
2 the date on which the Secretary receives a transfer request
3 pursuant to subsection (b), the Secretary shall make a de-
4 termination of whether such material change is substantial
5 enough to warrant additional review under section
6 80202(b). Not later than 60 days after a determination
7 that such review is warranted, the Secretary shall com-
8 plete a similar such review process for such transferee as
9 is required for a permit applicant under such section.

10 "(d) MATERIAL CHANGE.—Any transfer of a permit
11 under this chapter constitutes a material change under
12 section 80203(b).

13 **"§ 80205. Agency activities**

14 "(a) UTILIZATION OF FEDERAL GOVERNMENT VEHI-
15 CLE.—A person may apply for a permit to operate a
16 space-based remote sensing system that utilizes, on a
17 space-available basis, a civilian Federal Government sat-
18 ellite or vehicle as a platform for such system. The Sec-
19 retary, pursuant to this chapter, may permit such system
20 if it meets all conditions of this chapter.

21 "(b) ASSISTANCE.—The Secretary may offer assist-
22 ance to persons in finding appropriate opportunities for
23 the utilization described in subsection (a).

24 "(c) AGREEMENTS.—To the extent provided in ad-
25 vance by appropriation Acts, an agency may enter into an

1 agreement for the utilization described in subsection (a)
2 if such agreement is consistent with the agency's mission
3 and statutory authority, and if the space-based remote
4 sensing system is issued a permit by the Secretary under
5 this chapter before commencing operation.

6 **"§ 80206. Annual reports**

7 "(a) IN GENERAL.—The Secretary shall submit a re-
8 port to the Committee on Commerce, Science, and Trans-
9 portation of the Senate and the Committee on Science,
10 Space, and Technology of the House of Representatives
11 not later than 180 days after the date of enactment of
12 the American Space Commerce Free Enterprise Act of
13 2017, and annually thereafter, on—

14 "(1) the Secretary's implementation of this
15 chapter, including—

16 "(A) a list of all applications received in
17 the previous calendar year;

18 "(B) a list of all applications that resulted
19 in a permit;

20 "(C) a list of all applications denied and
21 an explanation of why each application was de-
22 nied, including any information relevant to the
23 adjudication process of a request for a permit;

24 "(D) a list of all applications that required
25 additional information; and

1 "(E) a list of all applications whose dis-
2 position exceeded the 60 day deadline, the total
3 days overdue for each application that exceeded
4 such deadline, and an explanation for the delay;
5 and
6 "(2) a description of all actions taken by the
7 Secretary under the administrative authority grant-
8 ed by section 80301.
9 "(b) CLASSIFIED ANNEXES.—Each report under sub-
10 section (a) may include classified annexes as necessary to
11 protect the disclosure of sensitive or classified information.
12 **"§ 80207. Advisory Committee on Commercial Remote**
13 **Sensing**
14 "(a) ESTABLISHMENT.—The Secretary shall estab-
15 lish an Advisory Committee on Commercial Remote Sens-
16 ing (in this section referred to as the 'Committee') con-
17 sisting of 15 members who shall be appointed by the Sec-
18 retary.
19 "(b) CHAIR.—The Committee shall designate one
20 member as the chair of the Committee.
21 "(c) MEMBERSHIP.—
22 "(1) LIMITATION.—Members of the Committee
23 may not be Federal Government employees or offi-
24 cials.

1 "(2) TRAVEL EXPENSES.—Members of the
2 Committee shall receive travel expenses, including
3 per diem in lieu of subsistence, in accordance with
4 the applicable provisions under subchapter I of chap-
5 ter 57 of title 5.
6 "(d) TERMS.—Each member of the Committee shall
7 serve for a term of 4 years and may not serve as a member
8 for the 2-year period following the date of completion of
9 each such term.
10 "(e) DUTIES.—The duties of the Committee shall be
11 to—
12 "(1) provide information, advice, and rec-
13 ommendations on matters relating to the United
14 States commercial space-based remote sensing in-
15 dustry;
16 "(2) analyze the effectiveness and efficiency of
17 the implementation of the space-based remote sens-
18 ing system permitting process under this chapter;
19 "(3) provide recommendations to the Secretary
20 and Congress on how the United States can facili-
21 tate and promote a robust and innovate private sec-
22 tor that is investing in, developing, and operating
23 space-based remote sensing systems;
24 "(4) identify any challenges the United States
25 private sector is experiencing with the authorization

1 and supervision of the operation of space-based re-
2 mote sensing systems under this chapter; and
3 "(5) provide information, advice, and rec-
4 ommendations on matters related to the authority of
5 the Secretary under this chapter or to private sector
6 space activities authorized pursuant to this chapter
7 that the Committee determines necessary.
8 "(f) ANNUAL REPORT.—The Committee shall submit
9 to Congress, the President, the Secretary, and the Direc-
10 tor of the Office of Space Commerce, an annual report
11 that includes the information, analysis, findings, and rec-
12 ommendations described in subsection (e).
13 "(g) SUNSET.—The Committee shall terminate on
14 the date that is 10 years after the date on which the Com-
15 mittee is established.

16 **"§ 80208. Continuation of existing license or pending**
17 **application**

18 "(a) CONTINUATION OF EXISTING LICENSE.—Any
19 United States entity for whom a license for the operation
20 of a space-based remote sensing system issued under sub-
21 chapter III of chapter 601 that is valid on the effective
22 date of this section may—
23 "(1) elect to be immediately considered per-
24 mitted for operation under this chapter, in which
25 case all terms and conditions of a license issued

1 under such subchapter with respect to the operation
2 of such system shall apply for the duration of the li-
3 cense; or
4 "(2) apply for a permit for operation under this
5 chapter and may continue to operate pursuant to
6 such license until such time as such permit is issued.
7 "(b) RESCIND OR TRANSFER OF PENDING LI-
8 CENSE.—An applicant with an application for a remote
9 sensing license under subchapter III of chapter 601 that
10 is pending on the effective date of this section may be,
11 at the election of the applicant—
12 "(1) rescinded without prejudice; or
13 "(2) transferred to the Office of Space Com-
14 merce and deemed to be a pending application for a
15 permit under this chapter.
16 "(c) EFFECTIVE DATE.—This section shall take ef-
17 fect on the date that is 1 year after the date of enactment
18 of the American Space Commerce Free Enterprise Act of
19 2017.
20 **"§ 80209. Commercial Remote Sensing Regulatory Af-**
21 **fairs Office**
22 "On the date that is 1 year after the date of enact-
23 ment of the American Space Commerce Free Enterprise
24 Act of 2017, the Commercial Remote Sensing Regulatory

1 Affairs Office of the National Oceanic and Atmospheric
2 Administration is abolished.".

3 **SEC. 5. ADMINISTRATIVE PROVISIONS RELATED TO CER-**
4 **TIFICATION AND PERMITTING.**

5 Title 51, United States Code, is further amended by
6 adding at the end the following:

7 "CHAPTER 803—ADMINISTRATIVE PROVI-
8 SIONS RELATED TO CERTIFICATION
9 AND PERMITTING

"Sec.
"80301. Administrative authority.
"80302. Consultation.
"80303. Appeal of denial or condition of certification or permit.
"80304. Exclusive authority for determination of international obligations.
"80305. Limitation on certain agency supervision.
"80306. Commercial exploration and use of outer space.
"80307. Rule of construction on concurrent application submission.
"80308. Federal jurisdiction.
"80309. Global commons.
"80310. Regulatory authority.
"80311. Consultation with relevant agencies.
"80312. Authorization of appropriations.

10 "§ 80301. Administrative authority

11 "(a) FUNCTIONS.—In order to carry out the respon-
12 sibilities specified in this subtitle, the Secretary may—

13 "(1) seek an order of injunction or similar judi-
14 cial determination from a district court of the
15 United States with personal jurisdiction over the
16 certification or permit holder to terminate certifi-
17 cations or permits under this subtitle and to termi-
18 nate certified or permitted operations on an imme-
19 diate basis, if the Secretary determines that the cer-

1 tification or permit holder has substantially failed to
2 comply with any provisions of this subtitle, or with
3 any terms of a certification or permit;
4 "(2) provide for civil penalties not to exceed
5 $10,000 (each day of operation constituting a sepa-
6 rate violation) and not to exceed $500,000 in total,
7 for—
8 "(A) noncompliance with the certification
9 or permitting requirements or regulations
10 issued under this subtitle; or
11 "(B) the operation of a space object or
12 space-based remote sensing system without the
13 applicable certification or permit issued under
14 this subtitle;
15 "(3) compromise, modify, or remit any such
16 civil penalty;
17 "(4) seize any object, record, or report, or cop-
18 ies of materials, documents, or records, pursuant to
19 a warrant from a magistrate based on a showing of
20 probable cause to believe that such object, record, or
21 report was used, is being used, or is likely to be used
22 in violation of this subtitle or the requirements of a
23 certification or permit or regulation issued there-
24 under; and

1 "(5) make investigations and inquiries con-
2 cerning any matter relating to the enforcement of
3 this subtitle.
4 "(b) REVIEW OF AGENCY ACTION.—Any holder of,
5 or applicant for, a certification or a permit who makes
6 a timely request for review of an adverse action pursuant
7 to paragraph (2) or (4) of subsection (a) shall be entitled
8 to adjudication by the Secretary on the record after an
9 opportunity for any agency hearing with respect to such
10 adverse action. Any final action by the Secretary under
11 this subsection shall be subject to judicial review under
12 chapter 7 of title 5, as provided in section 80303 of this
13 chapter.
14 "(c) NO COST FOR CERTIFICATION OR PERMIT.—
15 The Secretary may not impose a fee or other cost on a
16 holder of, or applicant for—
17 "(1) a certification under chapter 801; or
18 "(2) a permit under chapter 802.
19 "(d) NO AUTHORITY TO SET CONDITIONS.—The
20 Secretary may not impose a substantive condition on, or
21 any other requirement for, the issuance of a certification
22 or permit except as specifically provided in this subtitle.
23 "(e) FOIA EXEMPTION.—Paragraph (3) of section
24 552(b) of title 5 shall apply with respect to any filing re-
25 lating to a certification or a permit under this subtitle.

1 "(f) LIMITATION ON EXCEPTIONS TO ADMINISTRA-
2 TIVE PROCEDURES.—The exceptions under section
3 553(a)(1), section 553(b)(B), or section 554(a)(4) of title
4 5 shall not apply with respect to a certification or permit
5 under this subtitle.

6 **"§ 80302. Consultation**

7 "(a) SENSE OF CONGRESS.—It is the Sense of the
8 Congress that—

9 "(1) the United States Government has assets
10 in Earth orbit critical to national security, scientific
11 research, economic growth, and exploration;

12 "(2) such assets represent a considerable in-
13 vestment of United States taxpayers; and

14 "(3) it is in the national interest of the United
15 States to facilitate opportunities to provide for the
16 protection of such assets.

17 "(b) REVIEW.—Not later than 30 days after the Sec-
18 retary issues a certification under chapter 801, the Sec-
19 retary shall review the operations of any space objects cov-
20 ered by the certification to determine whether the inter-
21 action between such operations and the operations of a
22 Federal Government space object present a substantial
23 risk to the physical safety of a space object operated by
24 either party.

1 "(c) REQUIREMENT TO PARTICIPATE IN CONSULTA-
2 TION.—If the Secretary makes a determination that a sub-
3 stantial risk identified under subsection (b) exists, the
4 Secretary may require that the certification holder partici-
5 pate in a consultation under this section.
6 "(d) PARTIES TO A CONSULTATION.—
7 "(1) IN GENERAL.—A consultation under this
8 section may be held, with respect to a substantial
9 safety risk identified under subsection (b), be-
10 tween—
11 "(A) a certification holder responsible for
12 the certified space object operations; and
13 "(B) any entity of the Federal Government
14 operating a potentially affected space object.
15 "(2) PARTICIPATION.—The Secretary may not
16 impose any requirement on a party pursuant to par-
17 ticipation in the consultation.
18 "(e) MITIGATION OF SAFETY RISK.—In carrying out
19 a consultation, the Secretary shall—
20 "(1) facilitate a discussion among the parties to
21 the consultation;
22 "(2) encourage a mutual understanding of the
23 safety risk; and
24 "(3) encourage, to the maximum extent prac-
25 ticable, voluntary agreements between the parties to

1 the consultation to improve the physical safety of af-
2 fected space object operations or mitigate the phys-
3 ical safety risk.
4 "(f) DURATION OF CONSULTATION; NOTICE.—Not
5 later than 90 days after the Secretary requires a consulta-
6 tion under this section, the Secretary shall—
7 "(1) complete all activities related to the con-
8 sultation; and
9 "(2) submit to Congress a written notification
10 with respect to such consultation, that includes—
11 "(A) the names of each party to the con-
12 sultation;
13 "(B) a description of the physical safety
14 risk at issue;
15 "(C) whether any voluntary agreement was
16 made by the parties; and
17 "(D) the content of any such agreement.
18 "(g) RULE OF CONSTRUCTION.—Nothing in this sec-
19 tion shall be construed to grant any additional authority
20 to the Secretary to regulate, or place conditions on, any
21 activity for which a certification or permit is required
22 under this title.

1 **"§ 80303. Appeal of denial or condition of certifi-**
2 **cation or permit**

3 "An applicant who is denied a certification under sec-
4 tion 80103(b)(2)(B), an applicant who is denied a permit
5 under section 80202(b)(2)(B), or an applicant whose cer-
6 tification or permit is conditioned pursuant to section
7 80103(c) or section 80202(c), respectively, may appeal the
8 denial or placement of a condition to the Secretary. The
9 Secretary shall affirm or reverse the denial or placement
10 of a condition after providing the applicant notice and an
11 opportunity to be heard. The Secretary shall dispose of
12 the appeal not later than 60 days after the appeal is sub-
13 mitted. If the Secretary denies the appeal, the applicant
14 may seek review in the United States Court of Appeals
15 for the District of Columbia Circuit or in the court of ap-
16 peals of the United States for the circuit in which the per-
17 son resides or has its principal place of business.

18 **"§ 80304. Exclusive authority for determination of**
19 **international obligations**

20 "Except for the Secretary as authorized by this sub-
21 title, no agency may impose a requirement or make a find-
22 ing with regard to an international obligation of the
23 United States pertaining to a nongovernmental entity of
24 the United States under the Outer Space Treaty relating
25 to—

1 "(1) the operation of a space object certified
2 under chapter 801; and
3 "(2) the carrying out of a space debris mitiga-
4 tion plan of a space object for which a certification
5 was issued under chapter 801.
6 **"§ 80305. Limitation on certain agency supervision**
7 "(a) IN GENERAL.—Not later than 1 year after the
8 date of enactment of the American Space Commerce Free
9 Enterprise Act of 2017, no other agency shall have the
10 authority to authorize, place conditions on, or supervise
11 the operation of space objects required to be certified
12 under chapter 801 or space-based remote sensing systems
13 required to be permitted under chapter 802 except—
14 "(1) the Department of Transportation with re-
15 spect to launch or reentry vehicle operations licensed
16 under chapter 509; and
17 "(2) the Federal Communications Commission
18 with respect to space stations licensed under the
19 Communications Act of 1934 (47 U.S.C. 151 et
20 seq.); or
21 "(b) AGREEMENT LIMITATIONS.—Nothing in this
22 section shall be construed to prevent an agency from in-
23 cluding additional terms, conditions, limitations, or re-
24 quirements beyond those required in this subtitle in a con-
25 tract or other agreement with—

1 "(1) the holder of a certification under chapter
2 801 for the operation of the applicable space object;
3 or
4 "(2) the holder of a permit under chapter 802
5 for the operation of the applicable space-based re-
6 mote sensing system.

7 **"§ 80306. Commercial exploration and use of outer**
8 **space**

9 "To the maximum extent practicable, the President,
10 acting through appropriate Federal agencies, shall inter-
11 pret and fulfill international obligations, including under
12 the covered treaties on outer space, to minimize regula-
13 tions and limitations on the freedom of United States non-
14 governmental entities to explore and use space.

15 **"§ 80307. Rule of construction on concurrent applica-**
16 **tion submission**

17 "Nothing in this subtitle shall be construed to pre-
18 vent an applicant from submitting to the Secretary con-
19 current applications for a certification under chapter 801
20 and a permit under chapter 802. The Secretary shall pro-
21 vide for applications under Chapter 801 and Chapter 802
22 to be filed concurrently or at different times, at the discre-
23 tion of the applicant. To the maximum extent practicable,
24 the Secretary shall avoid duplication of information re-
25 quired in concurrently filed applications.

1 **"§ 80308. Federal jurisdiction**

2 "The district courts shall have original jurisdiction,
3 exclusive of the courts of the States, of any civil action
4 resulting from the operation of a space object for which
5 a certification or permit is required under this subtitle.

6 **"§ 80309. Global commons**

7 "Notwithstanding any other provision of law, outer
8 space shall not be considered a global commons.

9 **"§ 80310. Regulatory authority**

10 "(a) IN GENERAL.—The Secretary shall issue such
11 regulations as are necessary to carry out this subtitle.

12 "(b) REDUCING REGULATORY BURDEN.—In issuing
13 regulations to carry out this subtitle, the Secretary shall
14 avoid, to the maximum extent practicable, the placement
15 of inconsistent, duplicative, or otherwise burdensome re-
16 quirements on the operations of United States nongovern-
17 mental entities in outer space.

18 **"§ 80311. Consultation with relevant agencies**

19 "(a) IN GENERAL.—Subject to subsection (b), the
20 Secretary may, as the Secretary considers necessary, con-
21 sult with the heads of other relevant agencies in carrying
22 out this subtitle.

23 "(b) EXCLUSIVE AUTHORITY OF THE SECRETARY.—
24 The consultation authority provided by subsection (a)
25 shall not be interpreted to alter the exclusive authority of
26 the Secretary to authorize, place conditions on, and super-

1 vise the operation of space objects under chapter 801 and
2 space-based remote sensing systems under chapter 802,
3 as provided in and subject to the limitations of section
4 80305.

5 **"§ 80312. Authorization of appropriations**

6 "There are authorized to be appropriated $5,000,000
7 to the Office of Space Commerce for fiscal year 2018 to
8 carry out this subtitle.".

9 **SEC. 6. TECHNICAL AND CONFORMING AMENDMENTS.**

10 (a) TABLE OF CHAPTERS.—The table of chapters of
11 title 51, United State Code, is amended by adding at the
12 end the following:

"Subtitle VIII—Authorization and Supervision of Nongovernmental Space Activities

"801. Certification of Operation of Space Objects .....80101.
"802. Permitting of Space-Based Remote Sensing Systems .....80201.
"803. Administrative Provisions Related to Certification and Permitting .....80301.".

13 (b) REPEALS.—

14 (1) IN GENERAL.—Title 51, United States
15 Code, is amended as follows:

16 (A) Subchapter III of chapter 601 is re-
17 pealed.

18 (B) Section 60147 is repealed.

19 (C) The table of sections for chapter 601
20 is amended by striking the item relating to sec-
21 tion 60147.

1 (D) The table of sections for chapter 601
2 is amended by striking the items relating to
3 subchapter III.
4 (2) EFFECTIVE DATE.—The amendments made
5 by paragraph (1) shall take effect on the date that
6 is 1 year after the date of enactment of this Act.
7 (c) TECHNICAL CORRECTIONS.—
8 (1) IN GENERAL.—Title 51, United States
9 Code, is amended—
10 (A) in section 20302(c)(2), by striking
11 "means has the meaning" and inserting "has
12 the meaning";
13 (B) in section 50702(c)(5), by striking
14 "Space-Based Position" and inserting "Space-
15 Based Positioning"; and
16 (C) in section 71102(1), by striking
17 "tracking device" and inserting "tracking de-
18 vice to".
19 (2) CHAPTER 513.—The table of chapters of
20 title 51, United State Code, is amended by striking
21 the item related to chapter 513 and inserting the
22 following:

"513. Space Resource Commercial Exploration and Utilization ..... 51301.".

23 (3) CHAPTER 701.—The table of chapters of
24 title 51, United State Code, is amended by striking

1 the item related to chapter 701 and inserting the
2 following:

"701. Use of Space Launch System or Alternatives .....70101.".

3 **SEC. 7. OFFICE OF SPACE COMMERCE.**

4 Section 50702 of title 51, United States Code, is
5 amended—

6 (1) in subsection (a), by adding at the end be-
7 fore the period ", which shall be located in the prin-
8 cipal physical location of the Office of the Secretary
9 of Commerce";

10 (2) in subsection (b), by striking "a senior exec-
11 utive and shall be compensated at a level in the Sen-
12 ior Executive Service under section 5382 of title 5
13 as determined by the Secretary of Commerce" and
14 inserting "appointed by the President and confirmed
15 by the Senate. The Director shall be the Assistant
16 Secretary of Commerce for Space Commerce and
17 shall report directly to the Secretary of Commerce.";
18 and

19 (3) in subsection (c)—

20 (A) in paragraph (4), by striking "and" at
21 the end;

22 (B) in paragraph (5), by striking the pe-
23 riod at the end; and

24 (C) by adding at the end the following:

"(6) to authorize and supervise the operations of United States nongovernmental entities in outer space, pursuant to chapter 801 of this title;

"(7) to authorize and supervise the operations of space-based remote sensing systems pursuant to chapter 802 of this title; and

"(8) to facilitate and promote the development of best practices among operators of space objects and space-based remote sensing systems under this subtitle to address substantial risks to the physical safety of Federal Government space objects, including the risk of on-orbit collisions.".

SEC. 8. RESTRICTION ON PREVENTING LAUNCHES AND REENTRIES OF CERTIFIED SPACE OBJECTS.

Section 50904(c) of title 51, United States Code, is amended by adding at the end the following: "No launch or reentry may be prevented under this authority on the basis of national security, foreign policy, or international obligations of the United States, including under the covered treaties on outer space (as defined in section 80101) if the payload has received a certification to operate as a space object under chapter 801.".

SEC. 9. REPORT ON REGISTRATION OF SPACE OBJECTS.

(a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Secretary of Commerce,

1 acting through the Office of Space Commerce and in con-
2 sultation with the Private Space Activity Advisory Com-
3 mittee established under section 80109 of title 51, United
4 States Code, shall submit to the Committee on Science,
5 Space, and Technology of the House of Representatives
6 and the Committee on Commerce, Science, and Transpor-
7 tation of the Senate a report on the implementation of
8 the space object registration obligations of the United
9 States and other countries under Article VIII of the Outer
10 Space Treaty and the Convention on Registration of Space
11 Objects.

12 (b) CONTENTS OF REPORT.—The report required
13 under subsection (a) shall include—

14 (1) an identification of the practices and proce-
15 dures among countries that are members of the
16 Outer Space Treaty and the Convention on Registra-
17 tion of Space Objects in implementing and com-
18 plying with the registration obligations contained in
19 the treaties;

20 (2) a description of any existing practices and
21 procedures of the Federal Government for the reg-
22 istration of nongovernmental space objects; and

23 (3) recommendations on how the registration of
24 space objects in the United States could be improved
25 to benefit the United States, including enabling

1 United States leadership in commercial space activi-
2 ties.

AMENDMENT TO H.R. _____

OFFERED BY MR. SMITH OF TEXAS

Page 1, line 4, strike "This Act" and insert "(a) SHORT TITLE.—This Act".

Page 1, after line 5, insert the following:

1 (b) TABLE OF CONTENTS.—The table of contents is
2 as follows:

Page 6, line 5, strike "**CERTIFICATES**" and insert "**CERTIFICATION**".

Page 6, line 16, strike "Executive Agency" and insert "Executive agency".

Page 11, line 13, strike "issue a certification" and insert "begin issuing certifications".

Page 11, line 17, strike "may" and insert "shall".

Page 15, line 2, strike "60" and insert "90".

Page 15, line 11, strike "60" and insert "90".

Page 17, line 1, strike "60 day" and insert "90-day".

Page 20, line 4, strike "TO" and insert "To".

Page 21, line 24, strike "60" and insert "90".

Page 22, line 21, strike "60" and insert "90".

Page 23, line 3, strike "(1) IN GENERAL.—" and redesignate accordingly.

Page 29, strike lines 1 through 10 and insert the following:

1 **"§ 80111. Protecting the interests of United States en-**
2 **tity space objects**
3 "The President shall—
4 "(1) protect the interests of United States enti-
5 ty exploration and use of outer space, including com-
6 mercial activity and the exploitation of space re-
7 sources, from acts of foreign aggression and foreign
8 harmful interference;
9 "(2) protect ownership rights of United States
10 entity space objects and obtained space resources;
11 and
12 "(3) ensure that United States entities oper-
13 ating in outer space are given due regard.".

Page 31, line 16, strike "may" and insert "shall".

Page 33, line 20, strike "BASED" and insert "BASED".

Page 36, line 9, strike "60" and insert "90".

Page 36, line 16, strike "60" and insert "90".

Page 39, line 11, strike "60 day" and insert "90-day".

Page 42, line 6, strike "government" and insert "Government".

Page 45, line 7, strike "TO" and insert "To".

Page 46, line 9, strike "60" and insert "90".

Page 47, line 6, strike "60" and insert "90".

Page 49, line 2, strike "60 day" and insert "90-day".

Page 56, line 7, strike "Sense" and insert "sense".

Page 57, line 1, strike "TO" and insert "To".

Page 58, line 22, strike "title" and insert "subtitle".

Page 60, line 20, strike "; or" and insert a period.

Page 60, lines 23-24, insert ", consistent with applicable provisions of law," after "requirements".

Page 61, line 21, strike "Chapter" each place it appears and insert "chapter".

Page 62, line 20, strike "may" and insert "shall".

Page 63, in the matter following line 12, strike "of Operation of" and insert "to Operate".

☒

AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. _____ OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS

Strike all after the enacting clause and insert the following:

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the "Facilitating Commer-
3 cial Enterprise in Space Act of 2017".

4 **SEC. 2. FINDINGS.**

5 Congress finds the following:

6 (1) The United States has a robust and innova-
7 tive private sector that is investing in, developing,
8 and placing into outer space, spacecraft and pay-
9 loads.

10 (2) Private sector activities in space, respon-
11 sibly carried out, can further the national security,
12 foreign policy, and economic interests of the United
13 States.

14 (3) An efficient and transparent licensing proc-
15 ess for private remote sensing space systems is bene-
16 ficial for economic growth and the maintenance of
17 national security and international obligations.

1 (4) Authorization and supervision mechanisms
2 for planned private sector activities in outer space
3 could be improved to address existing gaps in such
4 mechanisms for nontraditional endeavors as well as
5 to mitigate administrative burdens on private sector
6 entities.

7 **SEC. 3. MISSION CERTIFICATION.**

8 (a) IN GENERAL.—Chapter 509 of title 51, United
9 States Code, is amended—

10 (1) in section 50902—

11 (A) by redesignating paragraphs (21)
12 through (25) as paragraphs (23) through (27),
13 respectively;

14 (B) by redesignating paragraphs (12)
15 through (20) as paragraphs (13) through (21),
16 respectively;

17 (C) by inserting after paragraph (11) the
18 following:

19 "(12) 'mission' means the operation of a space
20 object, with or without human occupants, in outer
21 space, including on the Moon and other celestial
22 bodies."; and

23 (D) by inserting after paragraph (21) (as
24 so redesignated) the following:

25 "(22) 'space object'—

"(A) means—

"(i) a human-made object located in outer space, including on the Moon and other celestial bodies, with or without human occupants, that was launched from Earth, such as a satellite or a spacecraft, including component parts of the object; and

"(ii) all items carried on such object that are intended for use in outer space outside of, and independent of, the operation of such object;

"(B) includes any human-made object that is—

"(i) manufactured or assembled in outer space; and

"(ii) intended for operations in outer space outside of, and independent of, the operations of such object in which the manufacturing or assembly occurred; and

"(C) does not include—

"(i) an article on board a space object that is only intended for use inside the space object;

"(ii) an article manufactured or processed in outer space that is a material; or

"(iii) an article intended for use outside of a space object as part of the certified operations of the space object.";

(2) in section 50919(g)(1)—

(A) in subparagraph (A), by inserting "mission," after "reentry site,"; and

(B) in subparagraph (B), by inserting "mission," after "operation,"; and

(3) by inserting after section 50923 the following:

"§ 50924. Mission certification

"(a) IN GENERAL.—The Secretary of Transportation, in coordination with appropriate executive agencies, is authorized to grant certifications to conduct missions as provided in this section. The Secretary shall grant such certifications to the extent consistent with the international obligations, foreign policy, and national security interests of the United States, and with United States Government uses of outer space. Such certifications may include such conditions as the Secretary, in coordination with appropriate executive agencies, determines necessary for compliance with United States international obligations, the preservation of the foreign policy interests and

1 national security of the United States, and the protection
2 of United States Government uses of outer space.
3 "(b) PROHIBITION ON OPERATING WITHOUT CER-
4 TIFICATION.—
5 "(1) IN GENERAL.—Except as provided in para-
6 graph (2), no person that is subject to the jurisdic-
7 tion or control of the United States may, directly or
8 through any subsidiary or affiliate, conduct a mis-
9 sion without a certification under this section.
10 "(2) EXEMPTIONS.—The following classes of
11 missions are exempt from the prohibition under
12 paragraph (1):
13 "(A) A launch, reentry, operation of a
14 launch vehicle or reentry vehicle, or other space
15 activity the Government carries out for the Gov-
16 ernment, or planning or policies related to such
17 launch, reentry, operation, or activity, subject
18 to section 50919(g)(1).
19 "(B) An activity for which a license is re-
20 quired by the Department of Transportation
21 under chapter 509 of this title, by the Federal
22 Communications Commission under the Com-
23 munications Act of 1934 (47 U.S.C. 151 et
24 seq.), or by the Secretary of Commerce under
25 chapter 601 of this title, which shall be suffi-

1 cient to fulfill the obligations of the United
2 States under the Treaty on Principles Gov-
3 erning the Activities of States in the Explo-
4 ration and Use of Outer Space, including the
5 Moon and Other Celestial Bodies (signed at
6 Washington, Moscow, and London on January
7 27, 1967, ratified by the United States on Oc-
8 tober 10, 1967; 18 UST 2410).
9 "(C) A mission, or aspect thereof, con-
10 ducted for or with one or more executive agen-
11 cies, unless the Secretary and the relevant head
12 of each such agency determine that a certifi-
13 cation under this section is required to provide
14 effective supervision of such mission or aspect.
15 "(c) APPLICATION.—An applicant for a certification
16 under this section shall submit to the Secretary an appli-
17 cation containing such information and affirmations as the
18 Secretary may require, at such time and in such manner
19 as the Secretary may require.
20 "(d) HARMFUL CONTAMINATION.—
21 "(1) REVIEW.—The Secretary, in coordination
22 with the Administrator of the National Aeronautics
23 and Space Administration, shall review the informa-
24 tion and affirmations submitted by an applicant for
25 a certification pursuant to subsection (c) to assess

1 the adequacy of the proposed mission to avoid harm-
2 ful contamination of the Moon and other celestial
3 bodies and to avoid adverse changes in the environ-
4 ment of the Earth resulting from the introduction of
5 extraterrestrial matter. If the Secretary, in coordina-
6 tion with the Administrator of the National Aero-
7 nautics and Space Administration, determines that
8 the proposed mission will not adequately avoid such
9 harmful occurrences, the Secretary may require the
10 applicant to submit additional information, place
11 conditions on the approval of such application, or
12 deny such application.

13 "(2) TECHNICAL ASSISTANCE.—As part of the
14 review under paragraph (1), the Administrator of
15 the National Aeronautics and Space Administration
16 shall provide, without seeking reimbursement, as re-
17 quested by the applicant, technical assistance to the
18 proposed mission on avoidance of such harmful oc-
19 currences.

20 "(e) MITIGATION OF SPACE DEBRIS.—The Sec-
21 retary, in coordination with appropriate executive agen-
22 cies, shall review the information and affirmations sub-
23 mitted by an applicant for a certification pursuant to sub-
24 section (c) to assess the adequacy of the proposed mission
25 to mitigate space debris in the conduct and termination

1 of the mission. If the Secretary determines that the pro-
2 posed mission will not adequately mitigate space debris,
3 the Secretary may require the applicant to submit addi-
4 tional information, place conditions on the approval of
5 such application, or deny such application.

6 "(f) LIKELIHOOD OF POTENTIAL COLLISIONS.—The
7 Secretary, in coordination with appropriate executive
8 agencies, shall review the planned operational trajectories
9 of each proposed mission for a certification under this sec-
10 tion to determine the likelihood of potential collisions. The
11 Secretary shall notify an applicant of any such potential
12 collision that the Secretary determines is likely to occur.

13 "(g) MISSION CERTIFICATION REGISTRY.—

14 "(1) IN GENERAL.—The Secretary shall main-
15 tain a registry of certifications issued pursuant to
16 this section and the information contained therein.

17 "(2) MATERIAL CHANGE.—The Secretary is au-
18 thorized to require the holder of a certification under
19 this section to provide updated information on the
20 mission covered by such certification on a periodic
21 basis and whenever such mission experiences a mate-
22 rial change to operations that would affect any affir-
23 mation or information originally submitted in sup-
24 port of such certification pursuant to subsection (c).
25 In the event of a material change to the mission, the

1 Secretary, in coordination with appropriate executive
2 agencies, shall make such modifications to the cer-
3 tification of the mission as the Secretary determines
4 is necessary for compliance with United States inter-
5 national obligations, preservation of the foreign pol-
6 icy interests and national security of the United
7 States, and the protection of United States Govern-
8 ment uses of outer space.

9 "(3) REVOCATION.—In the event that the Sec-
10 retary determines that there is no practicable way
11 for a mission to maintain the compliance, preserva-
12 tion, or protection described in paragraph (2), the
13 Secretary is authorized to revoke the certification of
14 such mission.".

15 (b) CONFORMING AMENDMENT.—The table of sec-
16 tions for chapter 509 of title 51, United States Code, is
17 amended by adding at the end the following new item:

"51924. Mission certification.".

18 **SEC. 4. COMMERCIAL REMOTE SENSING AMENDMENTS.**

19 (a) Section 50702 of title 51, United States Code,
20 is amended—

21 (1) in subsection (a), by adding at the end be-
22 fore the period ", which shall be located in the prin-
23 cipal physical location of the Office of the Secretary
24 of Commerce";

1 (2) in subsection (b), by adding at the end the
2 following: "The Director shall report to the Deputy
3 Secretary of Commerce."; and
4 (3) in subsection (c)—
5 (A) in paragraph (4) by striking "and" at
6 the end;
7 (B) in paragraph (5) by striking the period
8 at the end and inserting "; and"; and
9 (C) by adding at the end the following:
10 "(6) to conduct the activities authorized in sub-
11 chapter III of chapter 601.".
12 (b) Section 60121 of title 51, United States Code,
13 is amended—
14 (1) in subsection (a) by adding at the end the
15 following:
16 "(3) LIMITATION ON LICENSING.—Sensing
17 technology that is not capable of imaging the Earth
18 shall not be subject to the licensing requirements of
19 this subchapter.
20 "(4) COMPLIANCE DETERMINATION.—
21 "(A) IN GENERAL.—Granting of a license
22 under this subchapter shall be deemed a deter-
23 mination that the license application addresses
24 the national security concerns of the United

1 States and fulfills applicable international obli-
2 gations.
3 "(B) MATERIAL CHANGE.—In the event of
4 a material change to the operations of a system
5 licensed under this subchapter that would affect
6 any affirmation or information originally sub-
7 mitted in support of the license, the Secretary,
8 in coordination with the heads of appropriate
9 Executive agencies, shall make such modifica-
10 tions to the license as the Secretary determines
11 are necessary for—
12 "(i) compliance with United States
13 international obligations; and
14 "(ii) the national security of the
15 United States.
16 "(C) REVOCATION.—With respect to a ma-
17 terial change described in subparagraph (B), if
18 the Secretary determines that there is no prac-
19 ticable way for the licensed operations to, due
20 to such material change, maintain compliance
21 with United States international obligations or
22 to address national security concerns, the Sec-
23 retary is authorized to revoke the license."; and
24 (2) in subsection (c)—

1 (A) by striking "120" and inserting "75";
2 and
3 (B) by inserting "The deadline for final ac-
4 tion may be extended an additional 30 days at
5 the request of the applicant." after "receipt of
6 such application.".

7 **SEC. 5. AUTHORIZATION OF APPROPRIATIONS.**

8 There are authorized to be appropriated to the Office
9 of Space Commerce of the Department of Commerce
10 $5,000,000 for fiscal year 2018.

AMENDMENT TO H.R. _____

OFFERED BY MR. BRIDENSTINE OF OKLAHOMA

At the end of the bill, add the following:

1 **SEC. ___. COMPTROLLER GENERAL REPORT.**

2 Not later than 180 days after the date of enactment
3 of this Act, the Comptroller General of the United States
4 shall submit to Congress a report on removing the Office
5 of Commercial Space Transportation from under the juris-
6 diction of the Federal Aviation Administration and rees-
7 tablishing the Office under the jurisdiction of the Sec-
8 retary of Transportation. Such report shall include—

9 (1) the identification of key practices for suc-
10 cessful organizational transitions;

11 (2) the advantages and disadvantages of the re-
12 moval and reestablishment with respect to the ability
13 of the Office to continue to coordinate and commu-
14 nicate with Federal Aviation Administration on air-
15 space issues; and

16 (3) the identification of any issues that are pre-
17 venting the Office from fully carrying out its statu-
18 tory mandate, and if such issues would persist re-

1 gardless of organizational location of the Office with-

2 in the Department of Transportation.

AMENDMENT TO H.R. _____

OFFERED BY MR. PERLMUTTER OF COLORADO

Page 27, line 10, strike "and".

Page 27, line 12, insert "and" after "outer space;".

Page 27, after line 12, insert the following:

1 "(D) with access to adequate, predictable,
2 and reliable radio frequency spectrum;".

☒

PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 2763, SMALL BUSINESS INNOVATION RESEARCH AND SMALL BUSINESS TECHNOLOGY TRANSFER IMPROVEMENTS ACT OF 2017

THURSDAY, JUNE 22, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:07 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recesses of the Committee at any time. Pursuant to Committee Rule II(e) and House Rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today, we meet to consider H.R. 2763, the *Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2017*.

Pursuant to notice, I now call up H.R. 2763, and the clerk will report the bill.

The CLERK. H.R. 2763, a bill to amend the *Small Business Act*, to improve the Small Business Innovation Research program and Small Business Technology Transfer program, and for other purposes.

Chairman SMITH. Without objection, the bill will be considered as read and open for amendment at any point, and I'll recognize myself for an opening statement.

First of all, I want to thank the gentleman from California, Mr. Knight, for introducing this legislation, which makes key improvements to the SBIR and STTR programs.

The SBIR Program was signed into law by President Reagan in 1982 to help spur innovation and increase small business participation in Federal research and development activity. Since its inception, this competitive grant program has funded more than 100,000 projects across America and has helped spawn familiar companies such as Qualcomm, Sonicare, and Symantec.

SBIR and STTR award winners also have created innovations critical to our national science and security efforts, such as parts

for the Mars Rover for NASA and a unique cockpit airbag system to protect Army helicopter pilots.

Today 11 Federal agencies provide funding to small businesses through SBIR, and five agencies provide funding through STTR, a total of nearly $3 billion this fiscal year. That's over 66 times greater than the $45 million spent under the original program in 1983.

Grant recipients have contributed to the country's scientific and technical knowledge, generating hundreds of patents and many contributions to applied science and knowledge. These small businesses have expanded innovation and helped strengthen our economy by creating jobs, thousands of good-paying jobs every year.

However, as we heard at a joint hearing conducted with the Small Business Committee last month, there is still room for improvement. For example, the General Accountability Office's recent review of SBIR and STTR raised red flags about irregular and incomplete reports to Congress by the SBA and participating agencies.

These are not new problems, and given the exponential growth in the program, it is long past time for them to be remedied. These assessment tools are crucial to ensure that taxpayers get maximum returns on their investment. We also need to keep in mind that these programs are intended to support innovators and entrepreneurs engaged in early stage research and development. We need to update SBIR and STTR in order to reflect a fast-changing business environment. Deficiencies in SBIR-STTR efficiency and effectiveness mean lost opportunities for innovative small enterprises.

The legislation before our Committee addresses both of these needs, and I congratulate Mr. Knight for developing such a responsible, forward-looking bill. It is appropriate to note that Mr. Knight also serves on the Small Business Committee as Chairman of the Subcommittee on Contracting and Workforce, which shares jurisdiction over SBIR and STTR. He was a leader for the timely reauthorization of the SBIR and STTR programs last year, which assured no interruption in Federal support for continuing innovation and commercialization from taxpayer-supported basic research.

Last week, the House Small Business Committee unanimously approved an amended version of H.R. 2763.

Today, I look forward to considering a handful of good reform and prioritization amendments, followed by our Committee's approval, which will move this legislation one step closer to House floor action and eventual enactment.

PREPARED STATEMENT OF CHAIRMAN SMITH

I thank the gentleman from California, Mr. Knight, for introducing this important legislation that makes key improvements to the SBIR and STTR programs.

The SBIR Program was signed into law by President Reagan in 1982 to help spur innovation and increase small business participation in federal research and development activity.

Since its inception, this competitive grant program has funded more than 100,000 projects across America and has helped spawn familiar companies such as Qualcomm, Sonicare, and Symantec.

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Chairman SMITH. I now recognize the gentlewoman from Texas, Ms. Eddie Bernice Johnson, for her opening statement.

Ms. JOHNSON. Thank you very much, Chairman, for holding this markup of H.R. 2763, the *Small Business Innovation Research and Small Business Technology Transfer Improvement Act of 2017*.

H.R. 2763 was introduced and previously marked up by our colleagues on the Small Business Committee. This morning, Members of the Science Committee have an opportunity to debate and amend this important legislation.

The Small Business Innovation Research program, or SBIR, was created in Congress—by Congress in 1982. Since then, it has grown in size from $45 million to over $2.2 billion, and expanded to include the Small Business Technology Transfer, or the STTR program.

The mission of the SBIR program is four-fold: To stimulate technological innovation, to use small businesses to help meet Federal research and development needs, to increase private sector commercialization of the results of federally funded research, and to foster the participation of women-and minority-owned firms in technological innovation.

I believe the evidence shows SBIR to be an extremely valuable program that we must continue to support and strengthen. However, I continue to believe we must consider the SBIR in the context of our broader Federal R&D investments.

In December 2016, Congress provided certainty for the SBIR program for the next 5 years by extending its authorization through

Fiscal Year 2022 at the current allocation level. I was pleased we were able to accomplish that small but important task.

As grant proposal success rates at NSF and NIH sink to historical lows for some programs, we should be very wary of any actions that would further destabilize the basic research enterprise that serves as the foundation for our Nation's innovation and economic growth. I would be very happy to see SBIR and STTR grow in addition to funding for Federal R&D overall, and I'm eager to work with my colleagues on both sides of the aisle to make that happen.

I will also note that the SBIR program has been evaluated in two rounds of reports by the National Academies. Overall, the Academies have found that agencies are meeting the first three objectives of the program, but falling short on the fourth objective of expanding participation of women and minorities. We must continue to push agencies on this objective. Our Nation's capacity to innovate will deteriorate rapidly if we keep excluding a large and growing percentage of our population from technological innovation and entrepreneurship.

This morning, Members on both sides are preparing to offer substantive amendments to the Small Business Committee's introduced bill. We will then have to reconcile any differences with the Small Business Committee's amendments.

While there will be policy issues on which we have disagreements, H.R. 2763 is a good bill, and I'm pleased to be able to work closely with the Chairman and my other Republican colleagues to advance it. I believe we can get to an agreement with the Small Business Committee and bring this bill to the House floor.

I thank you again, Chairman Smith, for holding this markup and for making this a bipartisan and transparent process. I hope we can do more of this in the coming weeks.

PREPARED STATEMENT OF MS. JOHNSON

Thank you Chairman Smith for holding this markup of H.R. 2763, the *Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2017*. H.R. 2763 was introduced and previously marked up by our colleagues on the Small Business Committee. This morning, Members of the Science Committee have an opportunity to debate and amend this important legislation.

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Thank you again, Chairman Smith, for holding this markup and for making this a bipartisan and transparent process. I hope we can do more of this in future months.

I yield back.

Chairman SMITH. Thanks, Ms. Johnson, for that nice opening statement.

The gentleman from California, Mr. Knight, the author of the bill, is recognized for an opening statement as well.

Mr. KNIGHT. Thank you, Mr. Chairman.

H.R. 2763 is a bipartisan bill that amends the *Small Business Act* to improve the Small Business Innovation Research, or SBIR, and Small Business Technology Transfer (STTR) programs.

Small businesses drive our economy and are key to America's global leadership in innovation. Small businesses are more nimble, can respond to market changes more rapidly than bigger counterparts, and make the United States more agile in the world economy.

The SBIR and STTR programs have proven to be very successful at driving small business participation in Federal R&D activities, and solving government agency problems, from protecting soldiers in the field to helping eradicate malaria.

Last year the Science Small Business Committees worked with the House and Senate Armed Services Committees to include a 5-year extension of the SBIR and STTR programs. This provided small businesses and the participating agencies alike with the confidence and security to know that these popular programs will continue to be there through 2022.

Last month, the Small Business Subcommittee on Contracting and Workforce that I chair held a joint hearing with the Science Research and Technology Subcommittee to look at recommendations for making minor adjustments to improve the SBIR and STTR. H.R. 2763 takes some of those recommendations and strengthens the program in five ways.

First, the bill insists on agency accountability, including several hard reporting deadlines for participating agencies and for the Small Business Administration (SBA) to provide Congress with better information and a greater grasp of the programs' strengths and weaknesses.

Second, the legislation clarifies congressional intent of the previous reauthorization to ensure that taxpayers reap the benefits of the SBIR and STTR programs by tying them to long-term projects at the DOD.

Third, the legislation extends a popular pilot program that would allow all participating agencies to award a phase II contract if the agency finds that the small business concern has already completed work typically done in that phase I.

Fourth, it makes permanent the option for participating agencies to establish Commercialization Readiness Programs (CRPs). As a pilot program, CRPs have shown to provide much needed assistance to small firms nearing the completion of the process and have helped advance technology to the commercialization phase.

And last, it extends a provision to allow participating agencies to utilize 3 percent of their allocation for administrative functions, increase waste, fraud, and abuse efforts, and conduct outreach in an effort to bring more companies into the SBIR and STTR world.

It's important to note that while the SBIR and STTR programs provide an average of $3 billion in awards to small firms annually, it does so without direct appropriations. These programs simply provide that approximately 3.65 percent of already appropriated extramural R&D dollars be provided for small businesses through these programs.

I look forward to working with my colleagues on both the Science Committee and the Small Business Committee to refine the bill, and move it to the floor for a vote.

I want to thank the Chairman, Small Business Chairman Chabot, Chairman Smith for his leadership and supporting this opportunity, and I yield back the balance of my time.

PREPARED STATEMENT OF MR. KNIGHT

H.R. 2763 is a bi-partisan bill that amends the *Small Business Act* (Act), to improve the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs.

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Last year the Science Small Business Committees worked with the House and Senate Armed Services Committees to include a 5 year extension of the SBIR and STTR programs. This provided small businesses and the participating agencies alike with the confidence and security to know that these popular programs will continue to be there, at least through 2022.

Last month, the Small Business Subcommittee on Contracting and Workforce that I chair held a joint hearing with the Science Research and Technology Subcommittee to look at recommendations for making minor adjustments to improve the SBIR and STTR programs

H.R. 2763 takes some of those recommendations and strengthens the program in five ways.

First, the bill insists on agency accountability, including several hard reporting deadlines for participating agencies and for the Small Business Administration (SBA) to provide Congress with better information and a greater grasp of the programs' strengths and weaknesses.

Second, the legislation clarifies congressional intent of the previous reauthorization to ensure that taxpayers reap the benefits of the SBIR and STTR programs by tying them to long-term projects at the Department of Defense.

Third, the legislation extends a popular pilot program that would allow all participating agencies to award a Phase II contract if the agency finds that the small business concern has already completed work typically done during Phase I.

Fourth, it makes permanent the option for participating agencies to establish Commercialization Readiness Programs (CRPs). As a pilot program, CRPs have shown to provide much needed assistance to small firms nearing the completion of the process and have helped advance technology to the commercialization phase.

Fifth, it extends a provision to allow participating agencies to utilize 3 percent of their allocation for administrative functions, increase waste, fraud, and abuse efforts, and conduct outreach in an effort to bring more companies into the SBIR and STTR world.

It is important to note that while the SBIR and STTR programs provide an average of $3 billion in awards to small firms annually, it does so without a direct appropriation. These programs simply provide that approximately 3.65 percent of already appropriated extramural R&D dollars be reserved for small businesses through these programs.

I look forward to working with my colleagues on both the Science Committee and the Small Business Committee to refine the bill, and move it to the floor for a vote.

Thank you Mr. Chairman for your support and this opportunity, and I yield back.

Chairman SMITH. Thank you, Mr. Knight.

We will now proceed with amendments in the order listed on the roster. The first amendment is a Manager's Amendment, and the clerk will report it.

The CLERK. Amendment to H.R. 2763 offered by Mr. Smith of Texas.

Chairman SMITH. The amendment is considered as read, and I'll recognize myself to explain the amendment.

This amendment includes several amendments that the Small Business Committee unanimously approved during their markup of H.R. 2763 last week. The amendment includes provisions that, one, clarify reporting deadlines and ensure Congress receives agency reports at the same time as the White House Office of Science and Technology Policy; two, helps SBIR and STTR grantees by increasing the portion of their award available for taking their ideas from concept to commercialization, creating more flexibility and funding guidelines for technical and business assistance grants, and expanding the number of local vendors eligible to provide services to awardees; and three, requires the Department of Defense to report to Congress any goals and incentives they devise to boost inclusion of SBIR and STTR develop technologies into larger programs of record.

This amendment includes many good bipartisan efforts to improve the SBIR and STTR programs and strengthens the underlying bill, and I urge my colleagues to support the Manager's Amendment.

Is there any further discussion on the Manager's Amendment? The gentleman from—yes—is recognized, Mr. Lipinski.

Mr. LIPINSKI. Thank you, Mr. Chairman.

I speak in favor of the Manager's Amendment just quickly. The second provision that you mentioned that was added in the Small Business Committee is the *Support Startup Businesses Act of 2017*, or *Startup Act*, which I introduced with Representatives Lujan and Schneider 2 weeks ago. It enjoys support in both the House and the Senate. It would increase the cap of the amount of each SBIR and STTR awards that can be used for technical assistance, so I think it's very important to be able to pay for things like market research, intellectual property protection or participation in entrepreneurial training programs like I-Corps. So it lets small businesses use their funds where they know they're needed the most, and so I think this would be very helpful to those who receive these grants.

So I thank the Chairman for the Manager's Amendment, and I yield back.

Chairman SMITH. Thank you, Mr. Lipinski.

And there is no further discussion on the amendment, the question is on agreeing to the Manager's Amendment.

All in favor, say aye.

And opposed, no.

The ayes have it, and the amendment is agreed to.

The next amendment on the roster is offered by the gentleman from Georgia, Mr. Loudermilk, and does the gentleman wish to be recognized?

Mr. LOUDERMILK. Ye, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. The clerk will read the amendment.

The CLERK. Amendment to H.R. 2763 offered by Mr. Loudermilk of Georgia, amendment number 001.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain the amendment.

Mr. LOUDERMILK. Well, thank you, Mr. Chairman.

My amendment seeks to focus the attention of the new Administrator of the Small Business Administration on the fact that the SBA has failed to submit a statutorily required annual SBIR/STTR report to Congress since 2014.

The amendment simply states that if the SBA fails to submit the reports on time, the Administrator's travel budget is frozen unless a statutorily required annual report is submitted to Congress.

At the SBIR/STTR hearing several weeks ago, the GAO witness highlighted the SBA's failure to provide objective information to Congress as a major impediment to informed decisionmaking and a liability in terms of congressional oversight of possible waste, fraud, and abuse.

I recognize this amendment is a big hammer. However, I think it shows Congress is serious about its oversight role and statutory authority no matter which party is in charge of the Administration.

I ask my colleagues to support me in this amendment to protect and preserve the authority of Congress. I yield back.

Chairman SMITH. Thank you, Mr. Loudermilk, and I'll recognize myself in support of the amendment.

Under the previous Administration, the SBA ignored a statutory mandate to report annually to Congress on the SBIR and STTR programs so that we can monitor their progress and conduct oversight. I trust under the new Administration and under the leadership of the new SBA Administrator, reports will be on time, but if not, this amendment gives the SBA plenty of incentive to follow the law. I'll recognize my colleague's support of the amendment as well.

Is there any further discussion on the amendment?

If not, all in favor say aye.

All opposed, no.

The ayes have it, and the amendment is agreed to.

The next amendment on the roster is offered by the gentleman from Illinois, Mr. Hultgren, and he is recognized for that purpose.

Mr. HULTGREN. Thanks, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 2763 offered by Mr. Hultgren of Illinois, amendment number 019.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. HULTGREN. Thank you, Mr. Chairman.

My amendment encourages manufacturing innovation in the United States by requiring Federal agencies to give a high priority to the SBIR and STTR programs to small businesses engaged in manufacturing R&D for the purpose of developing and producing new products and technologies in the United States.

American manufacturing means jobs. A thriving manufacturing sector is vital to our economy, putting people to work and driving growth. Ten percent of all Illinois workers are involved in manufacturing, and 12.4 percent of Illinois's gross domestic product is attributable to manufacturing, making up the largest share of Illinois GDP. Manufacturing facilities employ more than 27,000 workers across the 14th congressional District of Illinois, which I represent.

United States must continue to innovate manufacturing operations, techniques and specialized products to remain globally competitive. Making manufacturing innovation a high priority in the SBIR and STTR programs is just one that Congress can take action to spur the manufacturing sector.

Mr. Chairman, thank you for your support of the amendment, and I yield back.

Chairman SMITH. Thank you, Mr. Hultgren, and I'll recognize myself in support of the amendment, though my comments may not be quite so Illinois-centric as the gentleman's were.

American innovation in manufacturing is critical to our economy and to creating the jobs of the future. The SBIR and STTR programs should make it a priority to encourage production in the United States and support new and innovative methods and products for manufacturing, so I urge my colleagues to support the amendment.

Is there any further discussion on the amendment?

If not, the question is on agreeing to the Hultgren amendment.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

Up next is an amendment to be offered by the gentleman from Louisiana, Mr. Higgins, and he is recognized for that purpose.

Mr. HIGGINS. Mr. Chairman, I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 2763 offered by Mr. Higgins of Louisiana, amendment number 016.

Chairman SMITH. And without objection, the amendment is considered as read and the gentleman is recognized to explain his amendment.

Mr. HIGGINS. Mr. Chairman, thank you.

My amendment ensures that Federal agencies give high priority to small businesses that are engaged in cybersecurity research and development for awarding SBIR and STTR grants.

Every day the American government and the U.S. businesses are under attack from cyber threats. Cyber criminals and foreign adversaries spend every hour of every day trying to steal our valuable personal and government information. We must use every tool in

our arsenal to prevent, mitigate and defend against these attacks. Small businesses and startups are where some of the most innovative ideas and products exist for cyber warfare.

My amendment ensures that Federal Government is harnessing that expertise through the SBIR and STTR programs to meet one of the greatest security challenges of the 21st century.

Thank you, Mr. Chairman, for the opportunity to offer this amendment, and I yield back.

Chairman SMITH. Thank you, Mr. Higgins. By the way, we need to get you some company on the front row there.

I'll recognize myself in support of your amendment.

I support the gentleman's amendment and thank him for his leadership on cyber and other national security issues. Cybersecurity is a critical national priority, and Federal agencies should tap the SBIR and STTR programs to find solutions. Not all Federal agencies involved in the SBIR and STTR programs have cybersecurity in their missions, so I think we can work with our colleagues on the Small Business Committee to refine the language before the bill goes to the floor.

So I urge my colleagues to support the amendment.

Is there any further discussion?

If not, all in favor of Mr. Higgins' amendment, say aye.

No?

The ayes have it, and the amendment is agreed to.

Up next is an amendment offered by the gentleman from Illinois, Mr. Lipinski, and the gentleman is recognized for that purpose.

Mr. LIPINSKI. Mr. Chairman, I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 2763 offered by Mr. Lipinski of Illinois, amendment number 025.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. LIPINSKI. Mr. Chairman, this amendment would build on the SBIR/STTR program by requiring that funds be directed for a proof of concept partnership pilot program, essentially, a pilot for SBIR phase zero. The program would provide grants to innovative technology transfer programs at universities, research institutes, and national laboratories.

There are many reasons why scientists may not take the initial steps to see if their invention or concept has potential commercialization. They may lack sufficient funding, business expertise, or they may not have considered the possibility that their invention has commercial potential. These limitation stand in the way of scientists and engineers collaborating with businesses or investors to take their ideas to the next level.

This amendment would provide funding for programs that among other things actively seek out scientific discoveries with commercial potential, fund technology acceleration and validation, and provide entrepreneurial education to scientists and engineers. These efforts will improve the commercialization rate of Federal R&D, which in turn will create jobs and strengthen the economy.

This amendment was formerly introduced as the *Technology and Research Accelerating National Security and Future Economic Re-*

siliency, or *TRANSFER Act*, in the 113th Congress by Mr. Collins of New York and Mr. Kilmer of Washington, and passed through this Committee with bipartisan support but it was never enacted into law. Prior to the *TRANSFER Act* in the 2011 SBIR reauthorization, I sponsored a provision to create a phase zero pilot program at NIH. The NIH Centers for Accelerated Innovations and Research Evaluation and Commercialization Hubs, or REACH programs, are funded by this pilot program, and we heard about these during the hearing that we held on the reauthorization of this legislation of SBIR and STTR.

The REACH program creates three Centers in Kentucky, Minnesota and New York. In their first 2 years, these three Centers have produced 38 patent applications filed, 14 technology licenses negotiated, seven companies formed, 53 SBIR/STTR proposals submitted, and 70 promising technologies in the pipeline. Perhaps more important than these numbers, though, are the regional innovation ecosystems these universities are helping to build.

This amendment would help greatly expand the number of these types of successful centers around the country. A number of organizations including the National Venture Capital Association have expressed support for the *TRANSFER Act*. I urge the adoption of this amendment, which I think would be greatly helpful to the SBIR/STTR program and to American innovation, and I yield back.

Chairman SMITH. Thank you, Mr. Lipinski, and I'll recognize myself in support of the amendment, and I appreciate Mr. Lipinski's work on this issue over a long period of time.

The amendment is based on the *TRANSFER Act*, a bipartisan bill that the Science Committee has passed twice. The *TRANSFER Act* helps American taxpayers see a greater return on their Federal R&D investments by closing the gap between federally funded R&D efforts and the commercialization of new products and technologies. This means new products, technologies and medicines can be brought to market faster, and I urge my colleagues to support the amendment.

Is there any further discussion on the amendment?

If not—the Ranking Member, Ms. Johnson, is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman. I'll make my remarks very brief and simply say that I do support the transfer of this innovative technology from lab to the market. It's a good idea, I supported the last one, and I ask all of us to support the amendment.

Chairman SMITH. Thank you, Ms. Johnson.

The question is on the amendment.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

The next amendment is also by the gentleman from Illinois, Mr. Lipinski, and he is recognized for that purpose.

Mr. LIPINSKI. Mr. Chairman, I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 2763 offered by Mr. Lipinski of Illinois, amendment number 035.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman recognized to explain his amendment.

Mr. LIPINSKI. Thank you, Mr. Chairman.

The National Science Foundation's Innovation Corps, or I-Corps program, was created administratively by NSF in 2011 and authorized through language I authored, the *American Innovation and Competitiveness Act* that became law last year.

The I-Corps program offers valuable entrepreneurial education to scientists and engineers who are college research faculty, graduate students and postdoctoral fellows. The purpose is to help these individuals develop new innovative products from the world-class research they have conducted in their labs.

As everyone on this Committee knows, I've been an evangelist for I-Corps for the past 7 years. The program has had tremendous success through the NSF and has been expanded to other agencies including DOE, NIH, DOD, USDA and DHS. It has helped create new entrepreneurs and new tech jobs, and it's helping Federal taxpayers get the most out of their investment and research.

The current I-Corps program is successful in part to its focus on providing specific types of education and mentoring that budding entrepreneurs need at this initial stage when they are first attempting to create a product based on research they have conducted in the lab. But different types of support are needed at later stages as a small business attempts to establish itself and progress toward the market. These later stages would be where a small business would be applying for an SBIR/STTR phase I or phase II grant. To help provide the needed assistance for small businesses receiving grants in these phases, my amendment directs the NSF to create I-Corps phase I and phase II.

We know that there are existing business accelerators, university technology transfer programs, and training programs carried out by NSF and other Federal agencies that provide excellent templates for how to train and support early and mid-stage companies in achieving growth, scale and market entry.

If my amendment were added to this bill, NSF would convene experts from around the country and from a wide range of academic, industry and government sectors to assemble a model curriculum for phase I and II assistance by taking advantage of the best practices and lessons learned from existing programs. This training would be paid for out of the SBIR/STTR grants and only when the grant recipients believe this type of training would provide a better chance for the business to be successful; that is, it would not be required of all grantees.

The creation of I-Corps phase I and phase II could be a big boost to the goal of the SBIR program by helping small businesses create new jobs and helping taxpayers get a better return on their investments than SBIR/STTR grants. This is something everyone can and should support.

However, the Chairman has expressed a desire to have a broader discussion on this issue and to gather more information before moving forward. So at his request, I'm willing to withdraw this amendment as long as the Chairman gives me his assurance that we will have a hearing on this topic, hopefully soon, September, and then moving forward legislatively on this issue.

So I thank the Chairman and will yield to the Chairman.

Chairman SMITH. OK. Thank you, Mr. Lipinski. Let me comment on the amendment and then respond to your suggestion as well.

I appreciate your leadership and support of the I-Corps program. We do need to work with the National Science Foundation and external stakeholders on how to best leverage and build on the program's success. I look forward to working with the gentleman about holding a hearing to elicit ideas on how to strengthen the I-Corps program, encourage more entrepreneurs and startups, and create jobs.

So I thank the gentleman for working with us on this issue and appreciate his anticipated withdrawal of the amendment.

Mr. LIPINSKI. But what about that hearing?

Chairman SMITH. I will assure the gentleman that we will have a hearing either this millennium, this century, this decade, this year, this fall, and possibly in September.

Mr. LIPINSKI. I hope that possibly is a little stronger than that, and if it is, I guess right now I'll ask unanimous consent to withdraw my amendment.

Chairman SMITH. OK. Thank you, Mr. Lipinski. Without objection, the amendment is withdrawn.

The next amendment on the roster is offered by the gentleman from California, Mr. McNerney, and he is recognized.

Mr. MCNERNEY. I thank the Chairman. I've got an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 2763 offered by Mr. McNerney of California, amendment number 049.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman from California is recognized to explain his amendment.

Mr. MCNERNEY. Thank you.

One of the four objectives that Congress had in mind in establishing the SBIR program was to facilitate the increased participation by minority and disadvantaged persons in the technological innovation process. To date, 11 Federal agencies participating in the SBIR program have had participation for minority-owned businesses vary significantly from year to year. We need to address this inequity.

My amendment requires participating Federal agencies to conduct outreach to minority-serving institutions and the faculty that conduct research at those institutions. By doing so, we can enhance awareness and opportunities for mosquitoes and disadvantaged persons about the benefits and participates—and partnerships available through the SBIR and STTR programs. My amendment uses the definition under SBA that's been in place for decades and is widely accepted. There are a great many minority-serving institutions and researchers who work at these institutions across the country. MSIs serve high concentrations of minority students who have historically been underrepresented in higher education. For example, CSU Stanislaw in my district is a minority-serving institution that's been ranked as one of the best colleges in our Nation. Our country depends on innovation of MSIs and intellectual capital of its graduates.

In the 21st century, the growth of the American economy is increasingly going to be determined by the proliferation and innovation of technology and STEM-focused businesses. We should seek ideas and partnerships across the Nation, not limiting opportunities. It's critical to the growth of our economy that minority-owned businesses are connected to the technological ecosystem.

Basically, this amendment is simple. It just requires outreach to minority-serving institutions so there's consistent participation. It makes sense. I urge my colleagues to support it, and I yield back.

Chairman SMITH. Thank you, Mr. McNerney. I'll recognize myself in opposition to the amendment, but before I go into my objections, I wonder if the gentleman from California would consider withdrawing the amendment with this assurance: That I am almost 100 percent confident we are going to be able to agree on language between now and the House floor because we've had similar language in past bills that this Committee has considered. As the gentleman knows, we had a compromise that we were discussing. We really ran out of time before we could reach an agreement on the language, but again, I'm fairly confident that we can reach an agreement between now and the House floor and would like not to oppose the gentleman's amendment in detail right now unless he insists on it. And the gentleman is recognized to respond.

Mr. MCNERNEY. Well, I thank the Chairman for the offer, and I appreciate the effort that's been made. I want to continue that on a bipartisan basis. I think we had a little trouble with a couple of our definitions, and I just want to make sure that the Chairman understands that those are critical. They've been in use for decades, and we need to be careful when we tread down that path.

Chairman SMITH. I certainly understand that.

Mr. MCNERNEY. All right. With the Chairman's agreement in hand or cooperation in hand, I will agree to withdraw the amendment.

Chairman SMITH. OK. Thank you. Without objection, the amendment is withdrawn, and again, Mr. McNerney, I'm sure that we can reach some agreement on acceptable language that will be bipartisan.

Mr. MCNERNEY. All right, Mr. Chairman. With unanimous consent, I ask to withdraw the amendment.

Chairman SMITH. Thank you, Mr. McNerney.

The final amendment on the roster is offered by the gentleman from New York, Mr. Tonko, and he is recognized for that purpose.

Mr. TONKO. Mr. Chair, I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 2763 offered by Mr. Tonko of New York, amendment number——

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. TONKO. Thank you, Mr. Chair.

This amendment expresses a sense of Congress that agencies should consider providing additional support for the SBIR and STTR programs.

The SBIR and STTR programs are of utmost importance to our Nation. I am pleased to see the Committee preserve and improve

upon these critical programs. I along with millions of our fellow American recognize the value of innovative research. I will continue to fight to strengthen funding for agencies that support such cutting-edge research, and by extension, funding for the SBIR and STTR programs.

These programs have a proven record of driving innovation that has played a major role in American job creation, increased productivity, and United States global competitiveness. These programs have proven to be among the most successful drivers of technological innovation in our Nation's history, delivering more than 70,000 patents and revolutionary achievements in agriculture, in defense, in energy, health sciences, homeland security, space, transportation, and other fields. Thanks to phase I and phase II SBIR, countless jobs have been created in my own capital region of New York. Programs such as SBIR have helped our region give birth to a boon in high-technology innovation and economic development.

Numerous reviews by the National Academies have found that the SBIR and STTR programs are achieving their ambitious objectives of stimulating technological innovation, increasing small business participation in the Federal R&D enterprise, and increasing the commercialization of federally funded research and development. In fact, the National Academies surveys of SBIR/STTR phase II awardees over a 10-year period found that 27 percent of sales from National Institutions of Health-funded technologies and 36 percent of sales from National Science Foundation technologies generated more than $1 million in revenue.

Demand for the popular and highly competitive SBIR program remains high. At the National Science Foundation, only 17.2 percent of phase I proposals are funded, and at the National Institutes of Health, only 12.6 percent of phase I proposals are funded.

For these reasons and more, I ask that you support this sense of Congress to the extent it does not undermine other research and development programs. Agencies should consider providing additional support for the SBIR and STTR programs, especially in technology areas that are high priority for an agency's mission as well as for our Nation's economy.

Agencies are already able to provide additional support. This amendment encourages them to do so in cases where it would not undermine other research and development programs. This is nonbinding language. It simply encourages agencies to consider providing additional support for these very successful programs.

I recent held a roundtable in my district with SBIR and STTR recipients, who expressed the extraordinary value of these programs. I promised that I would do all that I can to support these critical programs—a promise I intend to keep.

I urge my colleagues to join me in supporting this simple sense of Congress amendment to show our strong commitment to the SBIR and STTR programs.

With that, I thank you, Mr. Chair, and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Tonko, and I'll need to recognize myself in opposition to the amendment. But let me say that I appreciate both the amendment and I appreciate the gentleman's

intent and I appreciate his desire to want to increase funding for these two great programs.

However, I need to oppose the amendment. Both SBIR and STTR receive all of their funding from Federal agencies' research budgets. SBIR began with a deduction of .2 percent from agencies' budgets. The SBIR allocation from basic research is now 3.2 percent, or 16 times higher. Today, 11 Federal agencies provide funding to small businesses through SBIR and five agencies provide funding through STTR, a total of nearly $3 billion this year. That's over six times greater than the $45 million spent under the original program in 1983, or an average increase of almost 200 percent per year.

There are other Committees in the House and Senate that wanted to increase the set-asides in the last reauthorization. Science Committee Republicans and Democrats last year stood together to oppose the increase in set-asides and protect funding for basic and fundamental research. So I can't support the amendment that increases the set-asides for SBIR and STTR, which is at the expense of Federal basic research budgets. In other words, I could support it but I don't want to cut the basic research, and I hope you understand that's the reason and nothing more.

So I urge my colleagues to oppose the amendment even though, as I say, it's well intended, and if there was another way to fund it without taking it out of basic research, I'd support the resolution, but I need to oppose it at this point.

Are there other Members who wish to be recognized to discuss the amendment? The gentlewoman from Texas, Ms. Johnson, is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. I strongly support the SBIR program and would like to see it grow. Like Mr. Tonko, I would like to see it grow along with growing budgets for all of our important research and development programs.

Unfortunately, under this Administration, critical science and technology investments at many of our agencies are under threat, which I believe really is the future of this Nation to make sure that we have strong research and development.

The Trump Administration is even proposing to cut NIH by 20 percent, the National Science Foundation by 11 percent. Never before have I seen such draconian cuts from any Administration, Democrat or Republican.

I have confidence that Congress will reject many of these harmful proposals but I worry that even Congress will not do enough to ensure continued U.S. leadership in science and technology.

This is simply a sense of Congress. Mr. Tonko lays out a strong case for why the SBIR program is a valuable part of our overall Federal R&D portfolio, and I associate myself with those comments.

I supported the 2011 SBIR and STTR reauthorization bill that included a 30 percent increase for the programs. The SBIR and STTR programs are currently authorized through Fiscal Year 2022 at a combine set-aside level of 3.65 percent. Given our current

budget environment, I supported and continue to support the flat 5-year extension included in last year's *National Defense Authorization Act*, and I do not believe we should revisit the terms of that agreement.

Mr. Tonko's amendment includes a non-binding sense of Congress that agencies should consider increasing their investments in the SBIR program without undermining other R&D programs. There may be some procurement agencies that would see a net benefit from voluntarily increasing their support by—for SBIR in technology areas relevant to their own mission. For other agencies, especially the basic research agencies, the tradeoff involves an increasing support for small business R&D and may not make—as I said in my opening statement, our basic research enterprise is already at risk due to flat or decreasing funding and the historically low proposal success rates. The 17.2 percent success rate for National Science Foundation's SBIR phase I grants as described in Mr. Tonko's amendment is troubling. Unfortunately, it is equal to or higher than the proposed success rates across most of the engineering directorate or at NSF.

Other research programs at NSF are even worse off. We cannot afford to take any actions that would further destabilize the basic research foundation upon which our entire innovation is built.

I want to thank Mr. Tonko for his carefully considered amendment, and I believe it strikes the right balance of supporting the SBIR programs without doing any harm to any important Federal reserve programs. I support this amendment and encourage my colleagues to do the same. This is simply a sense of Congress.

Thank you, and I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

Any other Member wish to speak on this amendment?

If not, the question is on——

Mr. TONKO. Mr. Chair?

Chairman SMITH. Who seeks recognition?

Mr. TONKO. Mr. Chair, if I might?

Chairman SMITH. The gentleman from New York is recognized.

Mr. TONKO. You know, just like the global race on space in the 1960's, which required our total investment and focus in a bipartisan way to achieve victory, as we did in 1969 by landing an American as the first on the Moon, we're in the midst of an innovation global race, and I think that this Committee is assigned the awesome responsibility of recognizing the tools that we need in the kit for our industries and our Nation to grow successfully in this innovation race.

I think the statement here made by the Committee is just that, that it's a sense of Congress. We would be recognized as partners with the agencies to say we do all that we can to provide the resources we need for SBIR and STTR.

When I had my roundtable with the recipients from those programs in my district most recently, they raised the issue that they go to international conferences, and because these two programs are so successful, other nations are setting up like programs and they're going to go beyond what we're funding here and we're going to lose intellect and we're going to lose innovation if we don't invest

and at least encourage it. It should be this Committee's mission to say we can do better, we must do better.

With that, I yield back.

Chairman SMITH. Will the gentleman yield to me before he yields back?

Mr. TONKO. Yes, sir.

Chairman SMITH. I just want to make two points, and I don't know that I disagree with a single word that the gentleman said and said well. My objections are that the funding for these programs have been increasing, as I mentioned a while ago, at almost 200 percent per year, and any money, additional money that goes to these two programs is going to come you f basic research, and I do not want to see that cut at all, and so I'll be happy to yield to the gentleman.

Mr. TONKO. Yes. Thank you.

We should also see it as our responsibility to suggest that perhaps these agencies need more dollars. Caving in here because we're limiting ourselves when we have an opportunity to raise that limitation that's been imposed, I'm really concerned about where this Administration is taking us in the midst of an innovation economy. It's about research, it's about innovation, and if we're taking those tools away, those investments away, if we're dumbing down, this should be an encouragement from this Committee to say we need to do more at these agencies that are in the midst of an innovation economy.

We're transitioning into something brand new here, and now is not the time to just dip our toe in the water and walk away. We need to plunge into it and give the private sector the tools it needs and the partnership it requires.

Mr. ROHRABACHER. Mr. Chairman?

Chairman SMITH. Thank you, Mr. Tonko.

Mr. ROHRABACHER. Mr. Chairman?

Chairman SMITH. The gentleman from California, Mr. Rohrabacher, is recognized.

Mr. ROHRABACHER. Let me just note, I respect the gentleman's opinion and I know that there's a difference in approach between the two sides of the aisle but we can respect each other, and I do respect the idea that we need to spend more. That's the concept. We hear it off and on just about every subject. Let me just note that on this side of the aisle, we generally say we don't need to spend more, we need to spend better. We need to be more cognizant of the value of what we're doing, and we need to make sure that we are fine-tuning this so that the money that is being spent is being taken out of other areas of our economy, it's being spent for its best possible purpose.

So I would support the Chairman's opposition, but respecting the other side who obviously you have a desire to achieve the best goals for our country, and so do we.

Thank you very much, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Rohrabacher.

The question is on agreeing to the amendment offered by Mr. Tonko.

All in favor, say aye.

All opposed, no.

In the opinion of the Chair——

Mr. TONKO. Mr. Chair?

Chairman SMITH [continuing]. The nos have it and the amendment is not agreed to.

Mr. TONKO. Mr. Chair, I ask for a recorded vote, please.

Chairman SMITH. A recorded vote has been requested, and the clerk will call the roll. Mr. Perlmutter requested it too.

The clerk will call the roll.

The CLERK. Mr. Smith?

Chairman SMITH. No.

The CLERK. Mr. Smith votes no.

Mr. Lucas?

Mr. LUCAS. No.

The CLERK. Mr. Lucas votes no.

Mr. Rohrabacher?

Mr. ROHRABACHER. No.

The CLERK. Mr. Rohrabacher votes no.

Mr. Brooks?

Mr. BROOKS. No.

The CLERK. Mr. Brooks votes no.

Mr. Hultgren?

Mr. HULTGREN. No.

The CLERK. Mr. Hultgren votes no.

Mr. Posey?

Mr. POSEY. No.

The CLERK. Mr. Posey votes no.

Mr. Massie?

[No response.]

The CLERK. Mr. Bridenstine?

[No response.]

The CLERK. Mr. Weber?

Mr. WEBER. No.

The CLERK. Mr. Weber votes no.

Mr. Knight?

Mr. KNIGHT. No.

The CLERK. Mr. Knight votes no.

Mr. Babin?

Mr. BABIN. No.

The CLERK. Mr. Babin votes no.

Mrs. Comstock?

Mrs. COMSTOCK. No.

The CLERK. Mrs. Comstock votes no.

Mr. Palmer?

[No response.]

The CLERK. Mr. Loudermilk?

Mr. LOUDERMILK. No.

The CLERK. Mr. Loudermilk votes no.

Mr. Abraham?

Mr. ABRAHAM. No.

The CLERK. Mr. Abraham votes no.

Mr. LaHood?

Mr. LAHOOD. No.

The CLERK. Mr. LaHood votes no.

Mr. Webster?

[No response.]
The CLERK. Mr. Banks?
Mr. BANKS. No.
The CLERK. Mr. Banks votes no.
Mr. Biggs?
Mr. BIGGS. No.
The CLERK. Mr. Biggs votes no.
Mr. Marshall?
Mr. MARSHALL. No.
The CLERK. Mr. Marshall votes no.
Mr. Dunn?
Mr. DUNN. No.
The CLERK. Mr. Dunn votes no.
Mr. Higgins?
Mr. HIGGINS. No.
The CLERK. Mr. Higgins votes no.
Ms. Johnson?
Ms. JOHNSON. Aye.
The CLERK. Ms. Johnson votes aye.
Ms. Lofgren?
Ms. LOFGREN. Aye.
The CLERK. Ms. Lofgren votes aye.
Mr. Lipinski?
Mr. LIPINSKI. Aye.
The CLERK. Mr. Lipinski votes aye.
Ms. Bonamici?
[No response.]
The CLERK. Mr. Bera?
Mr. BERA. Aye.
The CLERK. Mr. Bera votes aye.
Ms. Esty?
Ms. ESTY. Aye.
The CLERK. Ms. Esty votes aye.
Mr. Veasey?
Mr. VEASEY. Aye.
The CLERK. Mr. Veasey votes aye.
Mr. Beyer?
Mr. BEYER. Aye.
The CLERK. Mr. Beyer votes aye.
Ms. Rosen?
Ms. ROSEN. Aye.
The CLERK. Ms. Rosen votes aye.
Mr. McNerney?
Mr. MCNERNEY. Aye.
The CLERK. Mr. McNerney votes aye.
Mr. Perlmutter?
Mr. PERLMUTTER. Aye.
The CLERK. Mr. Perlmutter votes aye.
Mr. Tonko?
Mr. TONKO. Aye.
The CLERK. Mr. Tonko votes aye.
Mr. Takano?
Mr. TAKANO. Aye.
The CLERK. Mr. Takano votes aye.

Mr. Foster?

[No response.]

The CLERK. Mr. Hanabusa?

[No response.]

The CLERK. Mr. Crist?

Mr. CRIST. Yes.

The CLERK. Mr. Crist votes aye.

Ms. Bonamici?

Ms. BONAMICI. Aye.

The CLERK. Ms. Bonamici votes aye.

Chairman SMITH. Are there any Members who wish to cast their vote or change their vote? And if not, the clerk will report the vote.

The CLERK. Mr. Chairman, 14 Members have voted aye, 18 Members have voted nay.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: 06-22-2017

Bill: H.R. 2763 AMENDMENT NO. 010
ROLL CALL NO. 1

Amendment Sponsor: Mr. Tonko **DEFEATED**

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. Smith, Texas, Chair		•		
2 Mr. Lucas, Oklahoma, Vice Chair		•		
3 Mr. Rohrabacher, California		•		
4 Mr. Brooks, Alabama		•		
5 Mr. Hultgren, Illinois		•		
6 Mr. Posey, Florida		•		
7 Mr. Massie, Kentucky				
8 Mr. Bridenstine, Oklahoma				
9 Mr. Weber, Texas		•		
10 Mr. Knight, California		•		
11 Mr. Babin, Texas		•		
12 Mrs. Comstock, Virginia		•		
13 Mr. Palmer, Alabama				
14 Mr. Loudermilk, Georgia		•		
15 Mr. Abraham, Louisiana		•		
16 Mr. LaHood, Illinois		•		
17 Mr. Webster, Florida				
18 Mr. Banks, Indiana		•		
19 Mr. Biggs, Arizona		•		
20 Mr. Marshall, Kansas		•		
21 Mr. Dunn, Florida		•		
22 Mr. Higgins, Louisiana		•		
1 Ms. Johnson, Texas, Ranking Member	•			
2 Ms. Lofgren, California	•			
3 Mr. Lipinski, Illinois	•			
4 Ms. Ms. Bonamici, Oregon	•			
5 Mr. Bera, California	•			
6 Ms. Esty, Connecticut	•			
7 Mr. Veasey, Texas	•			
8 Mr. Beyer, Virginia	•			
9 Ms. Rosen, Nevada	•			
10 Mr. Jerry McNerny, California	•			
11 Mr. Ed Perlmutter, Colorado	•			
12 Mr. Paul Tonko, New York	•			
13 Mr. Bill Foster, Illinois	•			
14 Mr. Mark Takano, California	•			
15 Ms. Colleen Hanabusa, Hawaii				
16 Mr. Charlie Crist, Florida	•			
17 VACANT				
TOTALS	15	18		

** Vice Chair

Chairman SMITH. The nays have it, and the amendment is not agreed to.

The gentleman from Illinois is recognized to cast a late vote as long as it's no. OK. Dr. Foster will be recorded as having voted aye.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space and Technology report H.R. 2763 to the House as amended with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 2763 to the House as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the Motion to Reconsider is laid upon the table. H.R. 2763 is ordered reported to the House, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

Thank you all for a great attendance today, a great discussion on an important bill, and we stand adjourned.

[Whereupon, at 10:59 a.m., the Committee was adjourned.]

Appendix:

H.R. 2763, Amendment Roster

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

I

115TH CONGRESS
1ST SESSION

H. R. 2763

To amend the Small Business Act to improve the Small Business Innovation Research program and Small Business Technology Transfer program, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 30, 2017

Mr. KNIGHT (for himself and Mrs. MURPHY of Florida) introduced the following bill; which was referred to the Committee on Small Business, and in addition to the Committee on Science, Space, and Technology, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

---

A BILL

To amend the Small Business Act to improve the Small Business Innovation Research program and Small Business Technology Transfer program, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2017".

1 **SEC. 2. REPORTING REQUIREMENTS.**

2 (a) ANNUAL REPORT TO CONGRESS.—Section
3 9(b)(7) of the Small Business Act (15 U.S.C. 638(b)(7))
4 is amended by striking "to report not less than annually"
5 and inserting "to submit a report not later than December
6 31 of each year".

7 (b) ANNUAL REPORT TO SBA AND THE OFFICE OF
8 SCIENCE AND TECHNOLOGY POLICY.—Section 9(g)(9) of
9 the Small Business Act (15 U.S.C. 638(g)(9)) is amended
10 by striking "make an annual report" and inserting "not
11 later than March 30 of each year, submit a report".

12 **SEC. 3. REQUIRING INSERTION INCENTIVES.**

13 Section 9(y)(5) of the Small Business Act (15 U.S.C.
14 638(y)(5)) is amended by striking "is authorized to" and
15 inserting "shall".

16 **SEC. 4. SBIR PHASE FLEXIBILITY.**

17 Section 9(cc) of the Small Business Act (15 U.S.C.
18 638(cc)) is amended by striking "During fiscal years" and
19 all that follows through "may each provide" and inserting
20 "During fiscal years 2018 through 2022, all agencies par-
21 ticipating in the SBIR program may provide".

22 **SEC. 5. ESTABLISHING THE CIVILIAN AGENCY COMMER-**
23 **CIALIZATION READINESS PROGRAM.**

24 Section 9(gg) of the Small Business Act (15 U.S.C.
25 638(gg)) is amended—

1 (1) by amending the subsection heading to read
2 as follows: "CIVILIAN AGENCY COMMERCIALIZATION
3 READINESS PROGRAM";
4 (2) in paragraph (1), by inserting "to establish
5 a Civilian Agency Commercialization Readiness Pro-
6 gram for civilian agencies" after "the covered Fed-
7 eral agency";
8 (3) in paragraph (2)(A)—
9 (A) by striking "establish a pilot program"
10 and inserting "establish a Civilian Agency Com-
11 mercialization Readiness Program under this
12 subsection"; and
13 (B) by striking "the pilot program" and
14 inserting "such Civilian Agency Commercializa-
15 tion Readiness Program";
16 (4) in paragraphs (3) and (4), by striking "a
17 pilot program" each place such term appears and in-
18 serting "a Civilian Commercialization Readiness
19 Program";
20 (5) in paragraph (6), by striking "the pilot pro-
21 gram" and inserting "a Civilian Agency Commer-
22 cialization Readiness Program";
23 (6) by striking paragraph (7) and redesignating
24 paragraph (8) as paragraph (7); and

1 (7) in paragraph (7) (as so redesignated), by
2 amending subparagraph (B) to read as follows:
3 "(B) the term 'Civilian Agency Commer-
4 cialization Readiness Program' means each pro-
5 gram established under paragraph (1).".

6 **SEC. 6. EXTENSION OF DEADLINE FOR ASSISTANCE FOR**
7 **ADMINISTRATIVE, OVERSIGHT, AND CON-**
8 **TRACT PROCESSING COSTS.**

9 Section 9(mm)(1) of the Small Business Act (15
10 U.S.C. 638(mm)(1)) is amended by striking "September
11 30, 2017" and inserting "September 30, 2022".

○

AMENDMENT TO H.R. 2763

OFFERED BY MR. SMITH OF TEXAS

Page 2, strike lines 7 through 11 and insert the following:

1 (b) ANNUAL REPORT TO SBA AND THE OFFICE OF
2 SCIENCE AND TECHNOLOGY POLICY.—Section 9(g)(9) of
3 the Small Business Act (15 U.S.C. 638(g)(9)) is amend-
4 ed—
5 (1) by striking "make an annual report" and
6 inserting "not later than March 30 of each year,
7 submit a report"; and
8 (2) by striking "and the Office of Science and
9 Technology Policy" and inserting ", the Office of
10 Science and Technology Policy, the Committee on
11 Science, Space, and Technology and the Committee
12 on Small Business of the House of Representatives,
13 and the Committee on Small Business and Entrepre-
14 neurship of the Senate"

At the end of the bill, add the following:

1 **SEC. _____. IMPROVEMENTS TO TECHNICAL AND BUSINESS**
2 **ASSISTANCE IN THE SBIR AND STTR PRO-**
3 **GRAMS.**
4 Section 9(q) of the Small Business Act (15 U.S.C.
5 638(q)) is amended—
6 (1) in the subsection heading, by inserting
7 "AND BUSINESS" after "TECHNICAL";
8 (2) in paragraph (1)—
9 (A) in the matter preceding subparagraph
10 (A)—
11 (i) by striking "a vendor selected
12 under paragraph (2)" and inserting "1 or
13 more vendors selected under paragraph
14 (2)(A)";
15 (ii) by inserting "and business" before
16 "assistance services"; and
17 (iii) by inserting "assistance with
18 product sales, intellectual property protec-
19 tions, market research, market validation,
20 and development of regulatory plans and
21 manufacturing plans," after "tech-
22 nologies,"; and
23 (B) in subparagraph (D), by inserting ",
24 including intellectual property protections" be-
25 fore the period at the end;
26 (3) in paragraph (2)—

1 (A) by striking "Each agency may select a
2 vendor to assist small business concerns to
3 meet" and inserting the following:
4 "(A) IN GENERAL.—Each agency may se-
5 lect 1 or more vendors from which small busi-
6 ness concerns may obtain assistance in meet-
7 ing"; and
8 (B) by adding at the end the following:
9 "(B) SELECTION BY SMALL BUSINESS
10 CONCERN.—A small business concern may, by
11 contract or otherwise, select 1 or more vendors
12 to assist the small business concern in meeting
13 the goals listed in paragraph (1)."; and
14 (4) in paragraph (3)—
15 (A) by inserting "(A)" after "paragraph
16 (2)" each place it appears;
17 (B) in subparagraph (A), by striking
18 "$5,000 per year" each place it appears and in-
19 serting "$6,500 per project";
20 (C) in subparagraph (B)—
21 (i) by striking "$5,000 per year" each
22 place it appears and inserting "$35,000
23 per project"; and
24 (ii) in clause (ii), by striking "which
25 shall be in addition to the amount of the

1 recipient's award" and inserting "which
2 may, as determined appropriate by the
3 head of the agency, be included as part of
4 the recipient's award or be in addition to
5 the amount of the recipient's award";
6 (D) in subparagraph (C)—
7 (i) by inserting "or business" after
8 "technical";
9 (ii) by striking "the vendor" and in-
10 serting "a vendor"; and
11 (iii) by adding at the end the fol-
12 lowing: "Business-related services may be
13 obtained from an entity, such as a public
14 or private organization or an agency of or
15 other entity established or funded by a
16 State, that facilitates or accelerates the
17 commercialization of technologies or assists
18 in the creation and growth of private en-
19 terprises that are commercializing tech-
20 nology.";
21 (E) in subparagraph (D)—
22 (i) by inserting "or business" after
23 "technical" each place it appears; and
24 (ii) in clause (i)—

1 (I) by striking "the vendor" and
2 inserting "1 or more vendors"; and
3 (II) by striking "provides" and
4 inserting "provide"; and
5 (F) by adding at the end the following:
6 "(E) MULTIPLE AWARD RECIPIENTS.—The
7 Administrator shall establish a limit on the
8 amount of technical and business assistance
9 services that may be received or purchased
10 under subparagraph (B) by a small business
11 concern that has received multiple Phase II
12 SBIR or STTR awards for a fiscal year.".
13 **SEC. ___. ADDITIONAL SBIR AND STTR TECHNOLOGY IN-**
14 **SERTION REPORTING REQUIREMENT.**
15 Section 9(y)(6) of the Small Business Act (15 U.S.C.
16 638(y)(6)) is amended—
17 (1) in subparagraph (B), by striking "and" at
18 the end;
19 (2) in subparagraph (C)(iii), by striking the pe-
20 riod at the end and inserting "; and"; and
21 (3) by adding at the end the following new sub-
22 paragraph:
23 "(D) not later than 120 days after the
24 date of the enactment of this subparagraph,
25 and not later than December 31 of each year

1 thereafter, submit to the Committee on Science,
2 Space, and Technology and the Committee on
3 Small Business of the House of Representa-
4 tives, and to the Committee on Small Business
5 and Entrepreneurship of the Senate, a report
6 describing the goals set under subparagraph
7 (A) and the incentives used or created under
8 subparagraph (B).".

AMENDMENT TO H.R. 2763

OFFERED BY MR. LOUDERMILK OF GEORGIA

At the end of the bill, add the following:

1 **SEC. _____. CONTINGENT LIMITATION ON USE OF CERTAIN**
2 **FUNDS PENDING SUBMISSION OF REPORT.**
3 (a) REPORT DEADLINE.—The Administrator of the
4 Small Business Administration shall submit the annual re-
5 port required under section 9(b)(7) of the Small Business
6 Act (15 U.S.C. 638(b)(7)) not later than the last day of
7 each calendar year.
8 (b) PROHIBITION ON AVAILABILITY OF FUNDS FOR
9 FAILURE TO SUBMIT REPORT.—If the Administrator does
10 not meet the deadline for submission under subsection (a)
11 with respect to a calendar year, no funds authorized to
12 be appropriated or otherwise made available to the Small
13 Business Administration by this Act, or any other Act,
14 may be obligated or expended for travel by the Adminis-
15 trator for the following calendar year until such time as
16 the Administrator submits the report described under sub-
17 section (a).

AMENDMENT TO H.R. 2763

OFFERED BY MR. HULTGREN OF ILLINOIS

At the end of the bill, add the following:

1 **SEC. 7. ENCOURAGING INNOVATION IN UNITED STATES**
2 **MANUFACTURING.**

3 Section 9 of the Small Business Act (15 U.S.C. 638)
4 is amended by adding at the end the following:

5 "(tt) ENCOURAGING INNOVATION IN UNITED STATES
6 MANUFACTURING.—In carrying out this section, the Ad-
7 ministrator shall—

8 "(1) ensure that, in selecting small business
9 concerns to participate in SBIR or STTR programs
10 under this section, Federal agencies give high pri-
11 ority to small manufacturing companies and other
12 small business concerns that are engaged in manu-
13 facturing research and development for the purpose
14 of developing and producing new products and tech-
15 nologies in the United States; and

16 "(2) include in the annual report to Congress
17 under subsection (b)(7) a determination of whether
18 the priority described in paragraph (1) is being car-
19 ried out.".

AMENDMENT TO H.R. 2763

OFFERED BY MR. HIGGINS OF LOUISIANA

At the end of the bill, add the following:

1 **SEC. 7. ENCOURAGING INNOVATION IN CYBERSECURITY.**

2 Section 9 of the Small Business Act (15 U.S.C. 638)
3 is amended by adding at the end the following:

4 "(tt) ENCOURAGING INNOVATION IN
5 CYBERSECURITY.—In carrying out this section, the Ad-
6 ministrator shall—

7 "(1) ensure that, in selecting small business
8 concerns to participate in SBIR or STTR programs
9 under this section, Federal agencies give high pri-
10 ority to small business concerns that are engaged in
11 cybersecurity research and development, for the pur-
12 pose of developing and implementing technology
13 services and products to strengthen the security of
14 United States Government and private computer
15 systems, including software, hardware, and portable
16 devices; and

17 "(2) include in the annual report to Congress
18 under subsection (b)(7) a determination of whether

1 the priority described in paragraph (1) is being car-
2 ried out.".

☒

AMENDMENT TO H.R. 2763

OFFERED BY MR. LIPINSKI OF ILLINOIS

At the end of the bill, add the following:

1 **SEC. _____. INNOVATIVE APPROACHES TO TECHNOLOGY**
2 **TRANSFER.**
3 Section 9(jj) of the Small Business Act (15 U.S.C.
4 638(jj)) is amended to read as follows:
5 "(jj) INNOVATIVE APPROACHES TO TECHNOLOGY
6 TRANSFER.—
7 "(1) GRANT PROGRAM.—
8 "(A) IN GENERAL.—Each Federal agency
9 required by subsection (n) to establish an
10 STTR program shall carry out an Innovative
11 Approaches to Technology Transfer Grant Pro-
12 gram (hereinafter referred to as a 'Program')
13 to support innovative approaches to technology
14 transfer at institutions of higher education (as
15 defined in section 101(a) of the Higher Edu-
16 cation Act of 1965 (20 U.S.C. 1001(a)), non-
17 profit research institutions, and Federal labora-
18 tories in order to accelerate the commercializa-
19 tion of federally funded research and technology

1 by small business concerns, including new busi-
2 nesses.
3 "(B) AWARDING OF GRANTS TO QUALI-
4 FYING INSTITUTIONS.—
5 "(i) IN GENERAL.—Each Federal
6 agency described in subparagraph (A) shall
7 provide grants, through a competitive,
8 merit-based process, in the amounts listed
9 in subparagraph (C)(i) to institutions of
10 higher education, technology transfer orga-
11 nizations that facilitate the commercializa-
12 tion of technologies developed by one or
13 more such institutions of higher education,
14 Federal laboratories, other public and pri-
15 vate nonprofit entities, and consortia there-
16 of, for initiatives that help identify high-
17 quality, commercially viable federally fund-
18 ed research and technologies and to facili-
19 tate and accelerate their transfer into the
20 marketplace.
21 "(ii) SELECTION PROCESS AND APPLI-
22 CATIONS.—Qualifying institutions seeking
23 a grant under this subsection shall submit
24 an application to a Federal agency de-
25 scribed in subparagraph (A) at such time,

1 in such manner, and containing such infor-
2 mation as the agency may require. The ap-
3 plication shall include, at a minimum—
4 "(I) a description of innovative
5 approaches to technology transfer,
6 technology development, and commer-
7 cial readiness that have the potential
8 to increase or accelerate technology
9 transfer outcomes and can be adopted
10 by other qualifying institutions, or a
11 demonstration of proven technology
12 transfer and commercialization strate-
13 gies, or a plan to implement proven
14 technology transfer and commer-
15 cialization strategies, that can achieve
16 greater commercialization of federally
17 funded research and technologies with
18 Program funding;
19 "(II) a description of how the
20 qualifying institution will contribute
21 to local and regional economic devel-
22 opment efforts; and
23 "(III) a plan for sustainability
24 beyond the duration of the funding
25 award.

1 "(iii) USE OF FUNDS.—Activities sup-
2 ported by grants under this subsection
3 may include—
4 "(I) providing early-stage proof
5 of concept funding for translational
6 research;
7 "(II) identifying research and
8 technologies at recipient institutions
9 that have the potential for accelerated
10 commercialization;
11 "(III) technology maturation
12 funding to support activities such as
13 prototype construction, experiment
14 analysis, product comparison, and col-
15 lecting performance data;
16 "(IV) technical validations, mar-
17 ket research, clarifying intellectual
18 property rights position and strategy,
19 and investigating commercial and
20 business opportunities; and
21 "(V) programs to provide advice,
22 mentoring, entrepreneurial education,
23 project management, and technology
24 and business development expertise to
25 innovators and recipients of tech-

1 nology transfer licenses to maximize
2 commercialization potential.
3 "(iv) PROGRAM OVERSIGHT BOARD.—
4 "(I) IN GENERAL.—Successful
5 applications required under clause (ii)
6 shall include a plan to assemble a
7 Program Oversight Board, the mem-
8 bers of which shall have technical, sci-
9 entific, or business expertise and shall
10 be drawn from industry, start-up com-
11 panies, venture capital, technical en-
12 terprises, financial institutions, and
13 business development organizations.
14 "(II) PROJECT AWARDS.—A Pro-
15 gram Oversight Board shall—
16 "(aa) establish award pro-
17 grams for individual projects;
18 "(bb) provide rigorous eval-
19 uation of project applications;
20 "(cc) determine which
21 projects should receive awards, in
22 accordance with guidelines estab-
23 lished by the Board;
24 "(dd) establish milestones
25 and associated award amounts

1 for projects that reach mile-
2 stones;
3 "(ee) determine whether
4 awarded projects are reaching
5 milestones; and
6 "(ff) develop a process to re-
7 allocate outstanding award
8 amounts from projects that are
9 not reaching milestones to other
10 projects with more potential.
11 "(C) GRANT AND AWARD AMOUNTS.—
12 "(i) GRANT AMOUNTS.—Each Federal
13 agency described in subparagraph (A) may
14 make grants under subparagraph (B) to
15 qualifying institutions for up to
16 $1,000,000 per year for up to 3 years.
17 "(ii) AWARD AMOUNTS.—Each quali-
18 fying institution that receives a grant
19 under subparagraph (B) shall provide
20 awards for individual projects of not more
21 than $150,000, to be provided in phased
22 amounts, based on reaching the milestones
23 established by the qualifying institution's
24 Program Oversight Board.

1 "(D) AUTHORIZED EXPENDITURES FOR
2 THE PROGRAM.—
3 "(i) PERCENTAGE.—The percentage
4 of the extramural budget that each Federal
5 agency described under subparagraph (A)
6 expends on a Program shall be—
7 "(I) 0.05 percent for each of fis-
8 cal years 2018 and 2019; and
9 "(II) 0.1 percent for each of fis-
10 cal years 2020 and 2021.
11 "(ii) TREATMENT OF EXPENDI-
12 TURES.—Any portion of the extramural
13 budget expended by a Federal agency on a
14 Program shall apply towards the agency's
15 expenditure requirements under subsection
16 (n).
17 "(2) PROGRAM EVALUATION AND DATA COL-
18 LECTION AND DISSEMINATION.—
19 "(A) EVALUATION PLAN AND DATA COL-
20 LECTION.—Each Federal agency required by
21 paragraph (1)(A) to establish a Program shall
22 develop a program evaluation plan and collect,
23 annually, such information from grantees as is
24 necessary to assess the Program. Program eval-
25 uation plans shall require the collection of data

1 aimed at identifying outcomes resulting from
2 the transfer of technology with assistance from
3 the Program, such as—
4 "(i) specific follow-on funding identi-
5 fied or obtained, including follow-on fund-
6 ing sources, such as Federal sources or
7 private sources;
8 "(ii) the number of projects which re-
9 sult in a license to a start-up company or
10 an established company with sufficient re-
11 sources for effective commercialization
12 within 5 years of receiving an award under
13 paragraph (1)(C)(ii);
14 "(iii) invention disclosures and pat-
15 ents;
16 "(iv) the number of projects sup-
17 ported by qualifying institutions receiving
18 a grant under paragraph (1)(C)(i) that se-
19 cure Phase I or Phase II SBIR or STTR
20 awards;
21 "(v) available information on revenue,
22 sales, or other measures of products that
23 have been commercialized as a result of
24 projects awarded under paragraph
25 (1)(C)(ii);

1 "(vi) the number and location of jobs
2 created resulting from projects awarded
3 under paragraph (1)(C)(ii); and
4 "(vii) other data as considered appro-
5 priate by a Federal agency required by this
6 subparagraph to develop a program evalua-
7 tion plan.
8 "(B) EVALUATIVE REPORT TO CON-
9 GRESS.—The head of each Federal agency that
10 has a Program shall submit to the Committee
11 on Science, Space, and Technology and the
12 Committee on Small Business of the House of
13 Representatives and the Committee on Small
14 Business and Entrepreneurship of the Senate
15 an evaluative report regarding the activities of
16 the Program. The report shall include—
17 "(i) a detailed description of the im-
18 plementation of the Program;
19 "(ii) a detailed description of the
20 grantee selection process;
21 "(iii) an accounting of the funds used
22 in the Program; and
23 "(iv) a summary of the data collected
24 under subparagraph (A).

1 "(C) DATA DISSEMINATION.—For pur-
2 poses of Program transparency and dissemina-
3 tion of best practices, the Administrator shall
4 include, on the public database under sub-
5 section (k)(1), information on the Program, in-
6 cluding—
7 "(i) the program evaluation plan re-
8 quired under subparagraph (A);
9 "(ii) a list of recipients of awards
10 under paragraph (1)(C)(ii); and
11 "(iii) information on the use of grants
12 under paragraph (1)(C)(i) by recipient in-
13 stitutions.".

AMENDMENT TO H.R. 2763

OFFERED BY MR. LIPINSKI OF ILLINOIS

At the end of the bill, add the following:

1 **SEC. 7. NATIONAL SCIENCE FOUNDATION INNOVATION**
2 **CORPS PROGRAM.**
3 (a) FINDINGS.—Congress finds the following:
4 (1) The National Science Foundation Innova-
5 tion Corps program (in this section referred to as
6 the "I-Corps program"), created administratively by
7 National Science Foundation in 2011 and statutorily
8 authorized in the American Innovation and Competi-
9 tiveness Act, has succeeded in increasing the com-
10 mercialization of government funded research.
11 (2) I-Corps provides valuable entrepreneurial
12 education to graduate students and postdoctoral fel-
13 lows, providing formal training for scientists and en-
14 gineers to pursue careers in business, an increas-
15 ingly common path for advanced degree holders.
16 (3) The current I-Corps Teams Program is suc-
17 cessful in part due to its focus on providing the spe-
18 cific types of support and mentoring entrepreneurs
19 need based on the early stage of their companies,

however this support is not available to entrepreneurs at later stages.

(4) The I-Corps Program's success in the early stages of the innovation continuum should be expanded to offer training to small businesses throughout all government funded stages of research and development.

(5) Existing business accelerators and university technology transfer programs provide an excellent template for how to train and support early- and mid-stage companies in achieving growth, scale, and market entry.

(b) I-CORPS PROGRAM TRAINING FOR SBIR AND STTR PARTICIPANTS.—

(1) IN GENERAL.—The Director of the National Science Foundation (in this section referred to as the "Director"), in consultation with other Federal agencies required to carry out SBIR or STTR programs under section 9 of the Small Business Act, I-Corps regional nodes, universities, and public and private entities engaged in technology transfer or commercialization of technologies, shall develop resources, to include model curriculum, training materials, and best practices, to support two entrepreneurial training programs: one program to provide

1 training for small business concerns participating in
2 phase I of an SBIR or STTR program (in this sec-
3 tion referred to as "I-Corps Phase I") and one pro-
4 gram to provide training for small business concerns
5 participating in phase II of an SBIR or STTR pro-
6 gram (in this section referred to as "I-Corps Phase
7 II").
8 (2) PUBLICLY AVAILABLE RESOURCES.—The
9 resources described in paragraph (1) shall be made
10 available to the public at no cost on the public Inter-
11 net website of the National Science Foundation.
12 (c) I-CORPS TRAINING SITES.—
13 (1) ELIGIBILITY CRITERIA.—The Director shall
14 develop and maintain eligibility criteria for programs
15 to become accredited training sites to provide train-
16 ing to small business concerns under the I-Corps
17 Phase I and Phase II programs using the resources,
18 curriculum, materials, and best practices developed
19 under subsection (b)(1). Programs eligible to apply
20 for such accreditation shall include those operated
21 by universities, State and local governments, non-
22 profit organizations, and public-private partnerships.
23 (2) REQUIREMENT FOR FEDERAL AGENCIES TO
24 PROVIDE TRAINING.—Each Federal agency with an
25 extramural budget for research or research and de-

1 velopment in excess of $100,000,000 shall make
2 available to small business concerns participating in
3 the agency's SBIR and, if applicable, STTR pro-
4 gram, training from accredited I-Corps Phase I and
5 Phase II training sites.

6 (d) DISCRETIONARY TECHNICAL ASSISTANCE.—The
7 Administrator of the Small Business Administration shall
8 ensure that the I-Corps program is designated as a vendor
9 eligible to provide small business concerns engaged in
10 SBIR or STTR projects with technical assistance services
11 under section 9(q) of the Small Business Act.

12 (e) REGIONAL CENTERS OF EXCELLENCE.—Each I-
13 Corps regional node shall become an accredited I-Corps
14 Phase I and Phase II training site and serve as a regional
15 center of excellence, continuously improving and maintain-
16 ing the curriculum over time, and providing support to
17 other organizations seeking to become accredited I-Corps
18 training sites as provided in subsection (c)(1).

19 (f) GAO EVALUATION.—The Comptroller General of
20 the United States shall commence an evaluation of the I-
21 Corps program at all phases, including Phase 0. Such
22 evaluation shall include—

23 (1) an assessment of any effect of the I-Corps
24 program on the commercialization of federally fund-
25 ed research and development;

1 (2) any such effect on the higher education sys-
2 tem; and
3 (3) any such effect on regional economies and
4 the national economy.

☒

AMENDMENT TO H.R. 2763

OFFERED BY MR. MCNERNEY OF CALIFORNIA

At the end of the bill, add the following:

1 **SEC. 7. OUTREACH TO MINORITY-SERVING INSTITUTIONS.**

2 Section 9(j)(2)(F) of the Small Business Act (15
3 U.S.C. 638(j)(2)(F)) is amended by inserting "and the
4 participation of minority institutions (as such term is de-
5 fined in section 365(3) of the Higher Education Act) and
6 faculty conducting research at such institutions," after
7 "Phase III of such programs,".

AMENDMENT TO H.R. 2763

OFFERED BY MR. TONKO OF NEW YORK

At the end of the bill, add the following:

1 **SEC. _____. SENSE OF CONGRESS ON THE VALUE OF THE**
2 **SBIR AND STTR PROGRAMS.**
3 (a) FINDINGS.—Congress finds the following:
4 (1) Numerous reviews by the National Acad-
5 emics have found that the SBIR and STTR pro-
6 grams are achieving their objectives of stimulating
7 technological innovation, increasing small business
8 participation in the Federal R&D enterprise, and in-
9 creasing the commercialization of federally funded
10 research and development.
11 (2) National Academies surveys of SBIR and
12 STTR Phase II awardees over a 10-year period
13 found that 27 percent of sales from technologies
14 funded by the National Institutes of Health and 36
15 percent of sales from National Science Foundation
16 technologies generated more than $1 million in rev-
17 enue.
18 (3) A third-party assessment of the U.S. Air
19 Force SBIR and STTR Program from 2000 through
20 2013 found that Phase II contracts generated out-

1 side follow-on investment of $1.9 billion, and sales of
2 new products and services totaling $14.7 billion.
3 Further, the study found that these contracts cre-
4 ated an average of more than 16,000 new full-time
5 jobs per year and resulted in $47.9 billion economic
6 output nationwide.
7 (4) Seventy-five percent of respondents to a
8 2015 National Academies survey of National Insti-
9 tutes of Health SBIR and STTR awardees reported
10 that the projects of such respondents would likely
11 not, or definitely not, have proceeded without SBIR
12 or STTR funding.
13 (5) The demand for the SBIR program remains
14 high. At the National Science Foundation only 17.2
15 percent of Phase I proposals are funded and at the
16 National Institutes of Health only 12.6 percent of
17 Phase I proposals are funded.
18 (b) SENSE OF CONGRESS.—It is the Sense of Con-
19 gress that, to the extent it does not undermine other re-
20 search and development programs, Federal agencies
21 should consider providing additional support for the SBIR
22 and STTR programs, especially in technology areas that
23 are a high priority for the Federal agency's mission and
24 for our nation's economy.

PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 1159, UNITED STATES AND ISRAEL SPACE COOPERATION ACT

THURSDAY, SEPTEMBER 28, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 9:04 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

H.R. 1159

Chairman SMITH. The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee Rule II(e) and House Rule 112(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today we meet to consider H.R. 1159, the *United States and Israel Space Cooperation Act* and pursuant to notice, I now call up H.R. 1159, the *United States and Israel Space Cooperation Act*, and the clerk will report the bill.

The CLERK. H.R. 1159, a bill to provide for continuing cooperation between the National Aeronautics and Space Administration and the Israel Space Agency, and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

I'll recognize myself for an opening statement, and then the Ranking Member designee for his opening statement.

Israel and the United States have a long history of shared cooperation, including space exploration and research. Scientists have collaborated on space research to advance both nations' understanding of the universe. NASA and the Israeli Space Agency have also formalized their cooperation in various agreements over the last 30 years.

Our two countries were bonded in 2003 when the first Israeli astronaut, Ilan Ramon, perished along with the other members of the Space Shuttle Columbia crew. Since then, Israel and the United States have cooperated on various experiments and space activities to the benefit of both nations.

On October 13th, 2015, NASA and the Israeli Space Agency entered into a 10-year agreement to continue cooperation on areas of

mutual interest in space. This agreement laid out the terms and conditions that will facilitate future cooperation, including export controls, technology transfer guidelines, intellectual property protections, and facility and system access controls. These terms and conditions will ensure that our partnership is productive and fruitful.

This legislation was introduced by Derek Kilmer, a former Member of this Committee, and Jim Bridenstine, a current Member. It reinforces cooperation between the United States and Israel, and advances our common goal of space exploration. I support the legislation and recommend it to my colleagues.

PREPARED STATEMENT OF CHAIRMAN SMITH

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I support the legislation and recommend it to my colleagues.

Chairman SMITH. And now the gentleman from Virginia, Mr. Beyer, is recognized for his opening statement.

Mr. BEYER. Good morning, and I want to thank our Chairman for holding this markup.

Today we're marking up H.R. 1159, the *United States and Israel Space Cooperation Act*. It is sponsored by Congressman Derek Kilmer and Congressman Jim Bridenstine.

One of the original objectives when Congress created NASA in 1958 was peaceful international cooperation. NASA's international collaborations have yielded many technical achievements. However, perhaps just as noteworthy are the diplomatic advances that have been achieved as the result of the goodwill that has been garnered from NASA's work with other nations.

One of the highlights of NASA's work in this area was the Apollo-Soyuz flight in 1975, which provided a peaceful avenue of cooperation with the Soviet Union at the height of the cold war, and later NASA collaborated with 15 other countries to construct and utilize the International Space Station.

Even today, in the midst of the many difficulties we're having with Russia, our ongoing collaborative work on the International Space Station remains a bright point in the relations between our country and Russia.

The country of Israel has also been an active collaborator with NASA, and these collaborations have been related to research, education, and spaceflight. Israel has also shared our Nation's pain on

one of the darkest days of our space program. As Chairman Smith noted, an Israeli astronaut, Ilan Ramon, was one of the astronauts who tragically perished in the Space Shuttle Columbia accident.

The bill before us today will help ensure that our close collaboration with Israel in space will continue into the future, and I strongly support its passage.

I want to thank Mr. Kilmer and Mr. Bridenstine for introducing this bill, and I want to thank Chairman Smith for holding today's markup.

With that, sir, I yield back.

Chairman SMITH. Thank you, Mr. Beyer.

The gentleman from Texas, Mr. Babin, is recognized for a statement.

Mr. BABIN. Thank you, Mr. Chairman.

Good morning. Today we mark up H.R. 1159, the *United States and Israel Space Cooperation Act*.

Israel and the United States have a very long history of shared cooperation including space exploration and research. Scientists have collaborated on space research to advance both nations' understanding of the universe.

NASA and the Israeli Space Agency have also formalized their cooperation in various agreements over the last 30 years. The bond between our two countries was forged deeper with the tragic loss in 2003 of the Space Shuttle Columbia crew, which included the first Israeli astronaut, Ilan Ramon.

Since then, Israel and the United States have cooperated on various experiments and space activities to the benefit of both of our nations. Space exploration offers humanity the opportunity to work toward common goals and our shared interests. It presents challenges of discovery that unite us all under a common banner regardless of our nationality.

This legislation would reinforce the bond between the United States and Israel and advance our common goals of discovery, inspiration and exploration, and I fully support this legislation and recommend its swift passage.

Thank you, and I yield back, Mr. Chairman.

PREPARED STATEMENT OF MR. BABIN

Good morning, I am glad you could join us for today's mark-up of H.R. 1159, the *United States and Israel Space Cooperation Act*.

Cooperation on the peaceful uses of outer space is special. Certainly, it is important to find common ground with our friends and allies in our profound appreciation for the wonderful and awe-inspiring mysteries of the cosmos.

However, in a time of turmoil and scarce resources, it is also vital that any common effort produce concrete accomplishments and returns for our citizens as well as those of our close allies.

This legislation succeeds on both accounts. It brings Israel and the United States closer together in the peaceful use and exploration of outer space. In doing so, this cooperation will benefit the researchers, scientists, and citizens of both our nations. The US has had a close relationship with the Israeli space program since its infancy, more than three decades ago. Our space cooperation with Israel blossomed and grew until NASA launched the first Israeli astronaut into space, Ilan Ramon.

Tragically, Ilan's first flight in 2003 was the final voyage of the Space Shuttle Columbia. That terrible accident was, in some ways, a symbol of the relationship between our two great nations. We are bound together in times of both triumph and sorrow. Our journey to the stars together has been, and will continue to be, a symbol of our voyage together as nations.

In 2015, more than 10 years after the Columbia accident, NASA and the Israeli Space Agency renewed their commitment to partnership, signing a 10-year agreement on peaceful cooperation in space.

That agreement elaborated a host of conditions to protect sensitive information that both nations possess. It also reaffirmed that all existing laws and regulations would remain in force.

This agreement, which will be further strengthened by the legislation under consideration today, will benefit both our nations.

Peaceful exploration and use of space offers all humanity a common, noble goal; extending our collective reach further into the heavens. Extending that reach and broadening our understanding of the universe is one of the most important and honorable challenges we can face together.

I believe that increasing cooperation between NASA and our allies is vital. It is my belief - and hope - that bringing our two space agencies closer together will make us more than the sum of our parts.

I support the legislation and recommend its swift passage.

Chairman SMITH. Thank you, Mr. Babin.

And the gentlewoman from Nevada, Ms. Rosen, is recognized for a statement as well.

Ms. ROSEN. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. ROSEN. Mr. Chairman, I want to lend my voice of support to this important legislation of which I'm proud to be a cosponsor. H.R. 1159 will reaffirm our commitment to the U.S.-Israel relationship to robust cooperation between our two countries in space exploration and other scientific endeavors.

This legislation is personally important to me both as a former systems analyst and computer scientist who believes deeply in supporting science and discovery, and also as a former president of the largest Reform synagogue in Nevada with a thriving Jewish community that cares deeply about Israel.

In the face of increasing threats in the Middle East and rising global anti-Semitism, the bonds between the United States and Israel are more important now than they ever have been. Israel is a beacon of democracy in the region, a strategic ally and economic partner, and a friend, and for these reasons, we must continue to strengthen our relationship in a variety of areas critical to our security and economy from missile defense, to joint training, research and development, intelligence sharing, and of course, our activities in space.

In addition to being an important diplomatic step, H.R. 1159 is also a reaffirmation of this body's support for scientific discovery. It is those moments of national awe and wonder like the Moon landing from my childhood that inspired children everywhere to pursue careers in science, technology, engineering, and math.

Today, by reporting this legislation out of Committee, we are saying with one voice that we remain committed to inspiring the next generation both here and in Israel and look upwards to pursue their dreams.

Mr. Chairman, I strongly support this bill, and thank Congressmen Kilmer, Bridenstine, and Veasey for introducing it, and to all my colleagues on the Committee, I urge its immediate adoption.

Thank you. I yield back.

Chairman SMITH. Thank you, Ms. Rosen.

Are there any other statements?

If not, are there any amendments?

And if not, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 1159 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 11159 to the House as amended.

All those in favor, say aye.

All those opposed, say nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the Motion to Reconsider is laid upon the table. H.R. 1159 is ordered reported to the House, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes, and without objection, so ordered.

Before we adjourn, I just want to thank all the Members who are present for being here. Your reward is a very quick markup, but I do appreciate everybody's attendance.

The other is that we are going to start the hearing of the two Subcommittees, joint hearing of the two Subcommittees immediately, because we expect votes at 10:15 and we'd like to get in as much testimony and as many questions as we can. So anyone who is on those two Subcommittees, if you'll just remain maybe in your seats, we'll get going on that hearing. Anyone else is welcome to stay, of course, if they have an interest in the subject. The hearing is primarily on the past eclipse.

So with that, thank you all for being here, and we stand adjourned.

[Whereupon, at 9:12 a.m., the Committee proceeded to other business.]

Appendix:

H.R. 1159

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

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115TH CONGRESS
1ST SESSION

H. R. 1159

To provide for continuing cooperation between the National Aeronautics and Space Administration and the Israel Space Agency, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 16, 2017

Mr. KILMER (for himself, Mr. BRIDENSTINE, Mr. DIAZ-BALART, and Mr. VEASEY) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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A BILL

To provide for continuing cooperation between the National Aeronautics and Space Administration and the Israel Space Agency, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "United States and Israel Space Cooperation Act".

SEC. 2. FINDINGS.

The Congress finds that—

(1) authorized in 1958, the National Aeronautics and Space Administration (NASA) supports

and coordinates United States Government research in aeronautics, human exploration and operations, science, and space technology;

(2) established in 1983, the Israel Space Agency (ISA) supports the growth of Israel's space industry by supporting academic research, technological innovation, and educational activities;

(3) the mutual interest of the United States and Israel in space exploration affords both nations an opportunity to leverage their unique abilities to advance scientific discovery;

(4) in 1996, NASA and the ISA entered into their first agreement outlining areas of mutual cooperation, which remained in force until 2005;

(5) since 1996, NASA and the ISA have successfully cooperated on many space programs supporting the Global Positioning System and research related to the sun, earth science, and the environment;

(6) the bond between NASA and the ISA was permanently forged on February 1, 2003, with the loss of the crew of STS–107 including Israeli Astronaut Ilan Ramon;

(7) the United States-Israel Strategic Partnership Act of 2014 (Public Law 113–296) designated

Israel as a Major Strategic Partner of the United States; and

(8) on October 13, 2015, the United States and Israel signed the Framework Agreement between the National Aeronautics and Space Administration of the United States of America and the Israel Space Agency for Cooperation in Aeronautics and the Exploration and Use of Airspace and Outer Space for Peaceful Purposes.

SEC. 3. CONTINUING COOPERATION.

The Administrator of the National Aeronautics and Space Administration shall continue to work with the Israel Space Agency to identify and cooperatively pursue peaceful space exploration and science initiatives in areas of mutual interest.

○

PROCEEDINGS OF THE FULL COMMITTEE MARKUPS: H.R. 4376, THE DEPARTMENT OF ENERGY RESEARCH INFRASTRUCTURE ACT OF 2017; H.R. 4377, ACCELERATING AMERICAN LEADERSHIP IN SCIENCE ACT OF 2017; H.R. 4378, NUCLEAR ENERGY RESEARCH INFRASTRUCTURE ACT OF 2017; H.R. 4375, STEM RESEARCH AND EDUCATION EFFECTIVENESS AND TRANSPARENCY ACT; H.R. 4323, SUPPORTING VETERANS IN STEM CAREERS ACT; H.R. 4254, WOMEN IN AEROSPACE EDUCATION ACT; AND H.R. 3397, BUILDING BLOCKS OF STEM ACT

WEDNESDAY, NOVEMBER 15, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:04 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order. Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee rule 2(e) and House rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today, we meet to consider H.R. 4376, the *Department of Energy Research Infrastructure Act of 2017*; H.R. 4377, the *Accelerating American Leadership in Science Act of 2017*; H.R. 4378, the *Nuclear Energy Research Infrastructure Act of 2017*; H.R. 4375, the *STEM Research and Education Effectiveness and Transparency Act*; H.R. 4323, the *Supporting Veterans in STEM Careers Act*; H.R. 4254, the *Women in Aerospace Education Act*; and H.R. 3397, the *Building Blocks of STEM Act*.

Now, all these seven bills are bipartisan bills, and we are only expecting one amendment on each of two bills, I believe.

I'll recognize myself for an opening statement.

Today, we will consider the seven bills, starting with three energy bills. Together, these first three bills direct and authorize upgrades to Department of Energy facilities across the country. DOE national labs host over 30,000 researchers each year. These bills provide infrastructure investments that are crucial to ensuring America remains a leader in basic research and innovation.

The first bill is H.R. 4376, the *Department of Energy Research Infrastructure Act*. This legislation, sponsored by Energy Subcommittee Vice Chairman Steve Knight and Representative Dan Lipinski, authorizes funds from the DOE Office of Science budget to complete construction of three science infrastructure projects. The bill provides upgrades to the ultraviolet and soft x-ray light source at Lawrence Berkeley National Lab and the x-ray laser at SLAC National Accelerator Lab at Stanford University, ensuring that these facilities remain the best in the world. These Advanced Light Sources facilitate research in chemistry, physics, biology, medicine, and manufacturing.

The Knight bill also authorizes and directs the construction of the Facility for Rare Isotope Beams at Michigan State University through the DOE Nuclear Physics program. This first-of-a-kind facility will allow researchers to study a variety of rare isotopes, advancing science discoveries in fields ranging from medicine to astrophysics.

The next energy bill is H.R. 4377, the *Accelerating American Leadership in Science Act*. This legislation authorizes upgrades to the Advanced Photon Source at Argonne National Lab and the Spallation Neutron Source at Oak Ridge National Lab. It also funds the construction of the Long Baseline Neutrino Facility, which, once completed, will be the premiere international facility in high-energy physics.

I want to thank this bill's sponsors, Representative Randy Hultgren and Representative Bill Foster, for their longstanding support of basic research and investments in these best-in-the-world science facilities.

H.R. 4378, the *Nuclear Energy Research Infrastructure Act*, is our third energy bill today. H.R. 4378, sponsored by Energy Subcommittee Chairman Randy Weber and full Committee Ranking Member Eddie Bernice Johnson, authorizes funds to construct the Versatile Neutron Source, a DOE fast neutron user facility that will facilitate the development of the next generation of nuclear reactors by the private sector. Advanced nuclear reactor technology provides the best opportunity to make reliable, emission-free electricity available throughout the industrial and developing world. This user facility will ensure U.S. companies develop this critical advanced reactor technology in the United States.

Next, we will consider four bipartisan STEM bills. The first is H.R. 4375, the *STEM Research and Education Efficiency and Transparency Act*, which requires a report to Congress on the effectiveness of NSF STEM education programs to help determine what investments work and which are not effective. The bill also improves the collection and reporting of data on individual Federal re-

search grant applications to ensure transparency. I want thank Research and Technology Subcommittee Chairwoman, Mrs. Comstock, and Ranking Member Johnson for their work on STEM issues and in particular promoting opportunities for women in STEM.

The next STEM bill is H.R. 4323, the Supporting Veterans in *STEM Careers Act*, which promotes veteran involvement in STEM education and research programs at NSF, including computer science and cybersecurity. The bill also establishes a Subcommittee at the National Science and Technology Council on veterans and military families.

I thank the lead sponsors of this bill, Congressman Dunn, an 11-year Army veteran and M.D.; and Mr. Takano, both Members of this Committee and the Veterans Affairs Committee as well.

I'd also like to acknowledge the six Science Committee Members who are original cosponsors of the bill and military veterans: Roger Marshall, Barry Loudermilk, Ralph Abraham, Brian Babin, Steve Knight, and Jim Banks.

The third STEM bill is H.R. 4254, the *Women in Aerospace Education Act*, which strengthens aerospace work force opportunities for women. It provides for internships at national labs and NASA centers through the NSF Noyce Teacher Scholarship Program and NASA fellowship opportunities. I thank the sponsors, Mr. Knight and Ms. Esty, for their work on promoting STEM opportunities for women.

And, Ms. Esty, I know you've been promoting that for years in fact, so nice to come to fruition.

The fourth STEM bill we will consider is H.R. 3397, the *Building Blocks of STEM Act*, which directs NSF to support STEM education research focused on early childhood. Ms. Rosen and Mr. Knight are the sponsors of this bill, and we appreciate their work as well.

PREPARED STATEMENT OF CHAIRMAN SMITH

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The third STEM bill is HR. 4254, the *Women in Aerospace Education Act*, which strengthens aerospace workforce opportunities for women. It provides for internships at national labs and NASA Centers through the NSF Noyce Teacher Scholarship Program and NASA fellowship opportunities.

I thank the sponsors, Mr. Knight and Ms. Esty, for their work on promoting STEM opportunities for women.

The fourth STEM bill we will consider is H.R. 3397, the *Building Blocks of STEM Act*, which directs NSF to support STEM education research focused on early childhood. Ms. Rosen and Mr. Knight are the sponsors of this bill, and we appreciate their work.

Chairman SMITH. I'll now recognize the Ranking Member, Eddie Bernice Johnson of Texas, for her opening statement.

Ms. JOHNSON. Thank you very much, Chairman Smith, for holding today's markup of seven bills, most or all of which should receive bipartisan support.

Included in today's markup are four STEM education-related bills: The *STEM Research and Education Effectiveness and Transparency Act*, the *Supporting Veterans in STEM Careers Act*, the *Women in Aerospace Education Act*, and the *Building Blocks of STEM Act*. I want to voice my support for all of these bills, each of which has bipartisan support.

I myself am cosponsor of the *STEM Research and Education Effectiveness and Transparency Act*, which includes a section from my own *STEM Opportunities Act*. I strongly believe that encouraging STEM education, especially in historically underserved groups is vital to ensuring a strong future for all Americans. Each of these bills contribute to improving access to STEM education in America, and I encourage my colleagues to support them all.

We are also marking up three bills which promote research at the Department of Energy: The *Department of Energy Research Infrastructure Act of 2017*, the *Accelerating American Leadership in Science Act of 2017*, and the *Nuclear Energy Research Infrastructure Act of 2017*. I support each of these bills. These bills will help to ensure that the Department of Energy has cutting-edge facilities to conduct the groundbreaking research we've come to expect of the Department.

I'm an original cosponsor of H.R. 4378, which establishes a new facility that would be critical for the development of advanced nuclear reactors. If we want American science and industry to remain at the forefront, these types of DOE research and user facilities are essential. I urge my colleagues to support each of these bills, and I thank you, Mr. Smith. I yield back.

PREPARED STATEMENT OF MS. JOHNSON

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Included in today's markup are four STEM education related bills: The *STEM Research and Education Effectiveness and Transparency Act*, the *Supporting Veterans in STEM Careers Act*, the *Women in Aerospace Education Act*, and the *Building Blocks of STEM Act*. I want to voice my support for all of these bills, each of which has bipartisan sponsorship.

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Thank you, Chairman Smith, and I yield back

Chairman SMITH. Thank you, Ms. Johnson.

H.R. 4376

Chairman SMITH. Pursuant to notice, I now call up H.R. 4376, the *Department of Energy Research Infrastructure Act of 2017*, and the clerk will report the bill.

The CLERK. H.R. 4376, a bill to direct the Secretary of Energy to carry out certain upgrades to research equipment and the construction of a research user facility and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And I'll recognize the sponsor of the bill, the gentleman from California, Mr. Knight, for his opening statement.

Mr. KNIGHT. Thank you, Mr. Chairman, for this opportunity to speak on behalf of this important legislation.

H.R. 4376, the *Department of Energy Research Infrastructure Act of 2017*, authorizes upgrades and construction of major user facilities at Department of Energy national labs and universities. My

bill will support the research infrastructure needed to conduct leading basic energy science and nuclear physics research initiatives here in the United States.

The Advanced Light Source (ALS) at Lawrence Berkeley National Lab is a specialized particle accelerator that generates bright beams of x-ray light for scientific research. The proposed upgrade to this facility will ensure that DOE can maintain ALS's status as a world-class x-ray facility and allow scientists to study the structure and behavior of materials at extremely small scales.

The Linac Coherent Light Source (LCLS) is the world's first hard x-ray, free-electron laser. The proposed upgrade to this facility, located at SLAC National Accelerator Laboratory at Stanford University, will provide a major jump in imaging capability and will enable researchers to perform groundbreaking experiments in chemistry, materials, biology, and energy.

The Facility for Rare Isotope Beams (FRIB) at Michigan State University is a one-of-a-kind, linear accelerator user facility that will allow researchers to study rare isotopes and their properties. This facility will support research that expands our understanding of atomic structures and could facilitate discoveries in medicine and physics. The research infrastructure authorized by this legislation will open the door for American entrepreneurs to develop the next generation of technology and train the next generation of researchers in chemistry, physics, and materials science. H.R. 4376 reaffirms the Federal Government's key role in basic research.

My home State of California has long been a world leader in advanced science and technology and is home to millions of entrepreneurs eager to take advantage of the best research facilities in the world. It's our job in Congress to make sure these facilities stay at the cutting edge of science, and keep the next generation of scientists and inventors here in the United States. These key user facility upgrades will enable transformative discoveries in basic science, and will give the private sector the tools they need to develop breakthrough technologies in medicine, manufacturing, and energy.

In Congress, it is our responsibility to take a long-term view and be patient. Making smart investments can lead to the next big discovery. My bill funds the research infrastructure necessary to make those discoveries possible.

I want to thank the Chairman. I want to thank Representatives Lipinski, Chairman Weber, Randy Hultgren for joining me as original cosponsors of this important legislation. I encourage my colleagues to support this bill, and I yield back the balance of my time.

PREPARED STATEMENT OF MR. KNIGHT

Thank you Mr. Chairman for the opportunity to speak on behalf of this important legislation.

H.R. 4376, the *Department of Energy Research Infrastructure Act of 2017*, authorizes upgrades and construction of major user facilities at Department of Energy (DOE) national labs and universities.

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In Congress, it is our responsibility to take the long-term view and be patient, making smart investments that can lead to the next big discovery. My bill funds the research infrastructure necessary to make those discoveries possible.

I want to thank Rep. Dan Lipinski, Chairman Lamar Smith, Energy Subcommittee Chairman Randy Weber and Rep. Randy Hultgren for joining me as original cosponsors of this important legislation.

I encourage my colleagues to support this bill, and I yield back the balance of my time.

Chairman SMITH. OK. Thank you, Mr. Knight.

And the gentleman from Illinois, Mr. Lipinski, is recognized.

Mr. LIPINSKI. Thank you, Mr. Chairman. Thank you for bringing forth these bipartisan bills today.

I want to thank my colleague from California, Mr. Knight, for introducing this bill. I'm very happy to join him on the bill. I also—I mention my support for the next two bills that we are going to be considering: The *Accelerating American Leadership in Science Act* and *Nuclear Energy Infrastructure Act*. All these bills authorize funding for critical research facilities that are within the Department of Energy. The projects funded by these bills will support world-class research facilities that are important for advancing fields of energy, medicine, material science, geology, chemistry, and many others. Not only do these research facilities advance our scientific understanding, they also serve as tools to improve our national security and support new product development.

One of the projects being authorized today is the Advanced Photon Source Upgrade at Argonne National Lab, which is in my district and also in Mr. Foster's district.

In addition to universities around the country, its user community for the Advanced Photon Source include major corporations such as Dow Chemical, Ford Motor Company, and GE, so it has a great user base, very important for industry.

All of these large-scale DOE research tools are national assets of a scale that only a Federal Government can provide, and it's our investment in them that makes the United States a world leader in research and innovation.

I want to urge my colleagues to support all these bills, and I will yield back.

Chairman SMITH. Thank you, Mr. Lipinski.

And the gentlewoman from Texas, Ms. Johnson, is recognized for her statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

This legislation includes authorizations of important upgrades for Department of Energy user facilities that are really vital to the U.S. scientific enterprise. Our laboratories are the crown jewels of American innovation, and the user-driven science facilities at those laboratories and at our universities are the foundation on which our leadership in science is built. I'm very pleased to see this bipartisan effort to expand our research capabilities of DOE, and I'm sure this is an area in which we can continue to work together.

I strongly support the passage of H.R. 4376, the *Department of Energy Research Infrastructure Act of 2017*, and I hope my colleagues will join me in ensuring that this swift consideration goes to the floor.

Thank you, Mr. Chairman. I yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Mr. Chairman.

This legislation includes authorizations of important upgrades to Department of Energy user facilities that are vital to the U.S. scientific enterprise. Our laboratories are the crown jewels of American innovation and the user-driven science facilities at those laboratories and at our universities are the foundation on which our leadership in science is built.

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I strongly support the passage of H.R. 4376, the *Department of Energy Research Infrastructure Act of 2017* and I hope my colleagues will join me in ensuring its swift consideration on the House floor.

Thank you, Mr. Chairman, I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

If there's no further discussion, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4376 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 4376 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 4376 is ordered reported to the House.

I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes, and without objection, so ordered.

H.R. 4377

Chairman SMITH. We will now go to H.R. 4377, and pursuant to notice, I call up H.R. 4377, the *Accelerating American Leadership in Science Act of 2017*, and the clerk will report the bill.

The CLERK. H.R. 4377, a bill to direct the Secretary of Energy to carry out an upgrade to research equipment and construction and construct research user facilities and for other purposes.

Chairman SMITH. And without objection, the bill is read—considered as read and open for amendment at any point.

I'll recognize the sponsor of the bill, Mr. Hultgren, for his statement.

Mr. HULTGREN. Thank you so much, Chairman Smith. Thank you, and I want to let you know how much I appreciate your work on this, Chairman, and the Committee's work to get this legislation moving forward. I'd also like to thank my colleagues from Illinois, Mr. Foster and Mr. Lipinski, for their support on this legislation. And I commend the Chairman of the Energy Subcommittee, Mr. Weber, and the gentleman from California, Mr. Knight, for their work on this bill and other legislation to maintain American leadership in research infrastructure.

I'd like to express my strong support for H.R. 4377, the *Accelerating American Leadership in Science Act*. This legislation authorizes priority research needs at our national laboratories and comes after extensive work with the scientific community and the Department of Energy Advisory Committees laying out a responsible path forward for America to maintain and build on our leadership role in scientific research.

Last night, the American winners of this year's Nobel Prize visited Washington, DC, and had a reception at the Ambassador of Sweden's residence. The prize ceremony in Sweden will be early next month.

We have the bulk of this year's winners, which is not unusual. The United States has nearly three times the number of Nobel Laureates than any other country. And this is not by chance. Before World War II, most countries were neck-and-neck. After the war, America realized that leadership in science was vital for our national security, as well as for our competitiveness. It was our national labs, borne out of the Manhattan Project, that gave our research community access the tools which no one university or company could ever maintain. This legislation continues our commitment to American leadership.

This bill authorizes construction of the Long Baseline Neutrino Facility, which this Committee heard about when it was first proposed by the High Energy Physics Advisory Panel's P5 report. I was at the groundbreaking of the far site in South Dakota earlier this year, and the international community has already pledge support for—of over $100 million dollars to be a part of this. This is an exciting time in science where more projects are becoming international.

Upgrades to the Advanced Photon Source maintain our leadership status in x-ray science, which have applications that have led to two Nobel Prizes in chemistry, as well as treatments for HIV and improvements in advanced manufacturing. These upgrades are again responding to the research community, and APS is already serving more than 6,000 researchers every year.

Upgrades to the Oak Ridge Spallation Neutron Source were again called out by the Basic Energy Science Advisory Committee, calling these upgrades, and I quote, "absolutely central to contribute to world-leading science," end quote. These upgrades would give the United States the most intense pulsed neutron beam in the world, serving researchers looking at material properties at the

atomic level. Again, I'd like to thank my colleagues for their work on this legislation and I urge passage by this Committee as we try to bring this to the floor.

And with that, Chairman, I yield back.

PREPARED STATEMENT OF MR. HULTGREN

Thank you chairman, and I appreciate your and the committee's work on this legislation.

I'd also like to thank my colleagues from Illinois, Reps. Foster and Lipinski, for their support on this legislation. And I commend the Chairman of the Energy Subcommittee, Mr. Weber, and the gentleman from California, Mr. Knight, for their work on this bill and other legislation to maintain American leadership in research infrastructure.

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Again, I would like to thank my colleagues for their work on this legislation and I urge passage by the committee as we try to bring this to the floor.

Chairman SMITH. Thank you, Mr. Hultgren.

And the—another gentleman from Illinois is recognized for his opening statement, Mr. Foster.

Mr. FOSTER. Thank you, Chairman Smith and Ranking Member Johnson, for holding this markup. I am proud to be offering this bipartisan bill with my colleague, Mr. Hultgren from Illinois, to authorize funding for three important projects: Argonne's Advanced Photon Source, Fermilab's Long Baseline Neutrino Facility, and Oak Ridge's Spallation Neutron Source Proton Power Upgrade. I also want to thank Mr. Knight and Mr. Lipinski, Mr. Weber, and Chairman Smith for their support as cosponsors of this bill as well.

The United States has been at the forefront of innovation and progress largely due to our investment in scientific research. The Department of Energy laboratories have made scientific discoveries

that will be in the science textbooks forever and have helped raise the standard of living for millions of Americans. This scientific progress requires us to take a long view. Discoveries—most discoveries are not made overnight, and experiments need sustained attention and resources for us to learn from them. Similarly, our scientific infrastructure requires long-term sustained funding to ensure opportunities are not missed.

Experiments conducted at Argonne National Laboratory's Advanced Photon Source, or APS, support both discovery science and market-driven research. Pharmaceutical research at the APS has yielded lifesaving new drugs for HIV, melanoma, and renal cell carcinoma. Industrial chemists have used the APS to develop energy-saving solar shingles while combustion researchers have developed a process that's led to cleaner diesel engines. And research conducted at the APS led to a Nobel Prize in chemistry in 2012 for work on G coupled protein receptors, which are helping us develop more effective medications to aid in our fight against opioid addiction.

The APS needs to be upgraded to ensure American scientists and companies continue to have access to the best scientific equipment in the world. The APS upgrade will use next-generation technology to make the APS hundreds of times brighter, opening up scientific frontiers at the nanoscale that are completely inaccessible today. The upgrade leverages the existing infrastructure, valued at about $1.5 billion, while applying new technologies to create a world-leading facility at substantially less cost than a new facility. This technology includes some really incredible magnets that someone who has spent a lot of his life optimizing magnet pole tip designs, these are right at the edge of what is possible, and I have great respect for our ability to pull this off. With this upgrade, the APS will become the ultimate 3-D microscope, and without it, the United States would lose its leadership in x-ray science to Europe, Japan, and China.

The second critical project this bill authorizes is the LBNF DUNE project, which is critical to maintaining U.S. leadership in high-energy physics and fundamental science. This facility, located at Fermi National Accelerator Laboratory in Batavia, Illinois, where I worked for 25 years and raised my family, and also at the Stanford—Sanford Underground Research Facility in Lead, South Dakota, will be the first major international world-class facility to be hosted by the United States.

Neutrinos are most—among the most abundant and fascinating particles in the universe, and understanding their nature may provide the key to understanding some of the most fundamental questions about the nature of our universe. LBNF DUNE would be the most powerful tool in the world to study these particles and would help solidify the Department of Energy's high-energy physics program as a world leader. More than 770 scientists from 150 institutions in 26 countries stand ready to contribute scientifically and with materials to the LBNF DUNE project, and I urge this Subcommittee to provide full and robust funding for the Department of Energy's high-energy physics account.

And finally, the third project authorizes the Oak Ridge Spallation Neutron Source Proton Power Upgrade. Oak Ridge's National

Laboratory's Spallation Neutron Source is the most powerful pulsed neutron experimental facility in the world. It provides researchers with a variety—in a variety of different disciplines with the capabilities to make precise measurements and answer the crucial fundamental questions that drive their research. But there are international competitors particularly in Europe that are challenging that leadership.

The proposal upgrades included in this bill, the second target station and proton power upgrade, will enable this facility to significantly increase the number of academic and industrial researchers that it can serve and to maintain its world-leading capabilities.

I'd also like to take note of the Department of Energy's very thoughtful leadership of this project from the start. One of the toughest things in a new project is trying to figure out how much scope to leave for potential upgrades, and it was done very well and very intelligently in the initial Spallation Neutron Source design. It's making this upgrade much cheaper than it would have been had it simply been taped on at the end of the project.

Investments in these projects and our broader scientific infrastructure are the only way to ensure that America remains an international leader.

Thank you, and I urge my colleagues to support this bill and yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Foster.

And the gentlewoman from Texas, Ms. Johnson, is recognized for her opening statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

Similar to the previous bill, this legislation would authorize upgrades to the Department of Energy's user facilities that were recommended by the Basic Energy Science Advisory Committee. These upgrades are critical to U.S. leadership in fundamental science and are important tools for industry and university researchers. These investments could significantly expand the number of users that can access these facilities.

On that note, I'm encouraged to see the inclusion of explicit authorization levels in the bill that we are considering today.

I'd like to thank Congressman Foster for his work on the Committee in highlighting the value of these user facilities, and of course he has personal experience. He is likely the only Member of Congress who can draw on his personal experience in supporting this work.

And I hope we can continue this bipartisan collaboration to authorize other vital research activities at the Federal science agencies that we oversee. I strongly encourage my colleagues to support and join me in voting for the bill.

And I thank you, Mr. Chairman, and yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Mr. Chairman.

Similar to the previous bill, this legislation would authorize upgrades to Department of Energy user facilities that were recommended by the Basic Energy Science Advisory Committee. These upgrades are critical to U.S. leadership in fundamental science and are important tools for industry and university researchers. These investments could significantly expand the number of users that can access these facilities. On that note, I am encouraged to see the inclusion of explicit authorization levels in the bills we are considering today.

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I strongly encourage my colleagues to join me in supporting this bill.

Thank you, Mr. Chairman, I yield back

Chairman SMITH. Thank you, Ms. Johnson.

If there's no further discussion, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4377 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 4377.

All in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 4377 is ordered reported to the House.

And I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

H.R. 4378

Chairman SMITH. Pursuant to notice, I now call up H.R. 4378, the *Nuclear Energy Research Infrastructure Act of 2017*. And the clerk will report the bill.

The CLERK. H.R. 4378, a bill to direct the Secretary of Energy to carry out the construction of the Versatile Reactor Base Fast Neutron Source and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And the gentleman from Texas, Mr. Weber, the Chairman of the Energy Subcommittee, is recognized for his opening statement.

Mr. WEBER. Thank you, Mr. Chairman. Good morning. And I appreciate the opportunity to speak on this critical legislation.

I want to thank you and Ranking Member Johnson for cosponsoring H.R. 4378, the *Nuclear Energy Research Infrastructure Act of 2017*, and quite frankly for you all's leadership in advocating for nuclear energy research and development.

I am grateful for the opportunity to work alongside my fellow Texans and the other Members of this Committee to support research projects that will keep America safe, globally competitive, and encourage nuclear innovation.

Last Congress, this Committee held hearings, met with stakeholders, and worked extensively with our colleagues in the Senate to draft the *Nuclear Energy Innovation Capabilities Act*. This comprehensive, bipartisan authorization bill directed the DOE, Department of Energy, to invest in supercomputing capabilities, create a framework for DOE to partner with the private sector to host prototype development for advanced reactors, and laid out a clear timeline and parameters for DOE to complete a research reactor. This bill passed the House three times last Congress and passed the House again in January as a part of the *DOE Research and Innovation Act*.

The research reactor, or Versatile Neutron Source, authorized in that bill is crucial for the development of advanced reactor designs, materials, and nuclear fuels. This type of research requires access to fast neutrons, which are currently only available for civilian research in Russia. While modeling and simulation can accelerate R&D, nuclear energy research must be validated through a physical source, like a research reactor. Today, we will consider my bill to authorize specific funding to build that research reactor.

H.R. 4378 allocates funds from within the DOE Office of Nuclear Energy for the construction of the Versatile Neutron Source. This facility is a reactor-based, fast neutron source that will operate as an open-access user facility in the DOE national lab system and will facilitate academic and proprietary research in the United States. Access to fast neutrons is a critical part of the development of next-generation materials and fuels for advanced nuclear reactor technology.

The Versatile Neutron Source will also enable the Nuclear Regulatory Commission to verify data on new fuels, materials, and designs more efficiently, expediting regulatory approval for advanced nuclear reactors. Without this user facility, this research simply will not take place. We cannot afford to lose the ability to develop innovative nuclear technology, and we cannot rely on international partners to develop safe and secure advanced reactors.

And as more developing nations look to nuclear energy to grow their economies, America must maintain our nuclear capabilities and continue to develop cutting-edge technology here at home. Let me add from a national security perspective, we want—no, make that we must have nuclear superiority. And so this bill will also help maintain that capability for America to influence security and proliferation standards around the world by maintaining cutting-edge nuclear science.

By building this user facility, we will fortify the U.S. commitment to safely advancing nuclear technology. H.R. 4378 will authorize funding to construct this critical user facility and ensure that we keep the best nuclear scientists, engineers, and entrepreneurs working right here in the United States.

I encourage my colleagues to support this bill, and, Mr. Chairman, I reserve the balance of my time.

PREPARED STATEMENT OF MR. WEBER

Good morning. Thank you Chairman Smith for the opportunity to speak on this critical legislation. I want to thank you and Ranking Member Johnson for cosponsoring H.R. 4378, the *Nuclear Energy Research Infrastructure Act of 2017*, and for y'all's leadership in advocating for nuclear energy research and development. I'm grateful for the opportunity to work alongside my fellow Texans and the other members of this committee to support research projects that will keep America safe and globally competitive and encourage nuclear innovation.

Last Congress, this committee held hearings, met with stakeholders and worked extensively with our colleagues in the Senate to draft the *Nuclear Energy Innovation Capabilities Act*.

This comprehensive, bipartisan authorization bill directed the Department of Energy (DOE) to invest in supercomputing capabilities, created a framework for DOE to partner with the private sector to host prototype development for advanced reactors and laid out a clear timeline and parameters for DOE to complete a research reactor. This bill passed the House three times last Congress, and passed the House again in January as a part of the *DOE Research and Innovation Act*.

The research reactor, or Versatile Neutron Source, authorized in that bill is crucial for the development of advanced reactor designs, materials and nuclear fuels.

This type of research requires access to fast neutrons - which are currently only available for civilian research in Russia. While modeling and simulation can accelerate R&D, nuclear energy research must be validated through a physical source, like a research reactor.

Today, we will consider my bill to authorize specific funding to build that research reactor. H.R. 4378 allocates funds from within the DOE Office of Nuclear Energy for the construction of the Versatile Neutron Source. This facility is a reactor based, fast neutron source that will operate as an open-access user facility in the DOE national lab system, and will facilitate academic and proprietary research in the United States.

Access to fast neutrons is a critical part of the development of next generation materials and fuels for advanced nuclear reactor technology. The Versatile Neutron

Source will also enable the Nuclear Regulatory Commission to verify data on new fuels, materials and designs more efficiently, expediting regulatory approval for advanced nuclear reactors.

Without this user facility, this research simply will not take place. We can't afford to lose the ability to develop innovative nuclear technology, or rely on international partners to develop safe and secure advanced reactors.

And as more developing nations look to nuclear energy to grow their economies, America must maintain our nuclear capabilities and continue to develop cutting edge technology here at home.

This bill will also help maintain America's capability to influence security and proliferation standards around the world by maintaining cutting edge nuclear science. By building this user facility, we will fortify the U.S. commitment to safely advancing nuclear technology.

H.R. 4378 will authorize funding to construct this critical user facility and ensure that we keep the best nuclear scientists, engineers and entrepreneurs working in the United States.

I encourage my colleagues to support this bill and I reserve the balance of my time.

Chairman SMITH. Thank you, Mr. Weber.

And the gentlewoman from Texas and original cosponsor of the legislation is recognized for her statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman. I'm pleased to cosponsor this bill with Congressman Weber. This legislation marks another accomplishment in our continued collaboration to advance nuclear energy innovation.

Nuclear power plays a vital role in providing our country with clean, reliable energy, but they are current technical, economic, and policy challenges that prevent nuclear energy from playing a larger role in enabling our clean energy future. This bill, the *Nuclear Energy Research Infrastructure Act*, would help address these challenges. It expands on a provision included in another bill that I cosponsored with Mr. Weber and the Chairman, H.R. 431, the *Nuclear Energy Innovation Capabilities Act*, which passed the House in January on a voice vote as part of yet another bill that I cosponsored with these two gentlemen, H.R. 589, the *Department of Energy Research And Innovation Act*.

The bill we are considering today would provide the Department of Energy the direction and funding it needs to create a national user facility with critical capabilities to advance nuclear technologies in America. I am hoping that if we provide our scientists and industry leaders with the right tools, they can fulfill the promise of clean nuclear energy that is safer, less expensive, more efficient, and produces less waste than the current fleet of reactors.

I'm also strongly supportive of the inclusion of the explicit funding levels as part of this authorization. Providing the Department and congressional appropriators with a funding profile for research activities and projects is a crucial responsibility in our role as an authorizing committee. In particular, this helps to ensure that con-

struction of cutting-edge research facilities like this one has the resources they need to be completed on time and on budget, thus making sure that the U.S. taxpayers, who are footing these bills, are getting the most value for their hard-earned dollars.

I hope we can continue to include funding authorizations in future bills passed out of this Committee, and I look forward to working with my colleagues on both sides of the aisle as we work to strengthen America's research enterprise across all of our agencies. I encourage my colleagues to support this bill, and I yield back the balance of time.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Mr. Chairman. I am pleased to cosponsor this bill with Congressman Weber.

This legislation marks another accomplishment in our continued collaboration to advance nuclear energy innovation.

Nuclear power plays a vital role in providing our country with clean, reliable energy. But there are currently technical, economic, and policy challenges that prevent nuclear energy from playing a larger role in enabling our clean energy future.

This bill, the *Nuclear Energy Research Infrastructure Act*, would help address these challenges. It expands on a provision included in another bill that I cosponsored with Mr. Weber and the Chairman - H.R. 431, the *Nuclear Energy Innovation Capabilities Act* - which passed the House in January on voice vote as part of yet another bill that I cosponsored with these two gentlemen - H.R. 589, the *Department of Energy Research and Innovation Act*.

The bill we are considering today would provide the Department of Energy the direction and funding it needs to create a national user facility with critical capabilities to advance nuclear technologies in America. I am hopeful that if we provide our scientists and industry leaders with the right tools, they can fulfill the promise of clean nuclear energy that is safer, less expensive, more efficient, and produces less waste than the current fleet of reactors.

I also strongly support the inclusion of explicit funding levels as a part of this authorization. Providing the Department and Congressional appropriators with a funding profile for research activities and projects is a crucial responsibility in our role as an authorizing committee. In particular, this helps ensure that construction of cutting edge research facilities like this one have the resources they need to be completed on time and on budget, thus making sure that the U.S. taxpayers who are footing these bills are getting the most value for their hard-earned dollars.

I hope we can continue to include funding authorizations in future bills passed out of the Committee and I look forward to working with my colleagues on both sides of the aisle as we work to strengthen America's research enterprise across all of our agencies.

I encourage my colleagues to support the bill, and I yield back the balance of my time.

Chairman SMITH. Thank you, Ms. Johnson.

If there's no further amendments——

Mr. ROHRABACHER. Mr. Chairman?

Chairman SMITH. Yes. Who—the gentleman from California, Mr. Rohrabacher, is recognized.

Mr. ROHRABACHER. I just would like to make sure we go on record when we're—and I support this legislation, but I'd like to go on record that we do need to look into new approaches when it comes to nuclear energy. For far too long we have been relying on basically concepts and technology that were developed 60 and 70 years ago. Light water reactors, while they—I believe they've been successful in providing us a great deal of electricity, they are inherently dangerous and, for example, in the San Onofre nuclear power plant in Orange County is now closed, and it's costing the taxpayers $70 million a year simply to oversee that facility that's now

closed because the nuclear waste from those years is sitting right there.

Now, I would hope that the money that is—that we are spending in this bill will not go to try to tweak light-water reactors and build the same type of systems. Instead, we are capable now of building small modular nuclear reactors that are safe, that will—cannot melt down, will not leave plutonium behind that can make bombs, and in fact will have a minimum of any type of waste as compared to light-water reactors.

So as we move forward with this particular research project that we're talking about right now, I would hope that we are on the record as saying let's break some new ground. Let's open up the new horizons instead of just trying to perfect the old systems and improve them a little bit.

And we also have to understand—and I think nuclear energy offers a tremendous source of clean energy as it has, but there was a price to that in the past that if we do it right now, we change this and go to a technology that we are capable of building, we can really endow future generations of Americans with clean energy that doesn't have the downside, which is the dangers of radiation material.

By the way, the new reactors will be able to use the waste from light-water reactors that are left over for their own fuel to produce energy for future generations. It's win-win, but I have seen a great hesitancy on the part of the industry to commit themselves to this new approach to nuclear energy.

And I would just say this, that we also have to pay attention in this Committee not only to the technology development but understanding that the technology development is step one, and I would sure hope that after we do develop new sources of nuclear energy that we go into the licensing procedures. We have been—there are so many restrictions now on new technology, especially in the nuclear field, that it takes decades to even think about it. And we were capable of building the type of light-water reactors I'm talking about, Mr. Chairman—we were capable of this 10, 15 years ago, and we've gone nowhere on it because the licensing requirements are so restrictive that it's holding back progress.

So with that said, I would support this legislation. I think it's terrific that we have this type of bipartisan approach to something that could well—and will if we succeed and we will succeed at it—ensure that future generations of Americans do have the type of wealth and—the wealth and the other—and that clean environment and energy that is necessary for people to have decent lives. Ordinary people in this country deserve a decent life, and we are laying the foundation for that today.

Thank you very much, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Rohrabacher, for those comments.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4378 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 4378 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 4378 is ordered reported to the House.

I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes, and without objection, so ordered.

H.R. 4375

Chairman SMITH. Pursuant to notice, I now call up H.R. 4375. We just didn't do that, did we—the *STEM Research and Education Effectiveness and Transparency Act*. And the clerk will report the bill.

The CLERK. H.R. 4375, a bill to provide for study on broadening participation on certain National Science Foundation research and education programs, to collect data on Federal research grants to science agencies, and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

I'll now recognize the sponsor of the bill, Mrs. Comstock, for her opening statement.

Mrs. COMSTOCK. Thank you, Mr. Chairman.

H.R. 4375, the *STEM Research and Education Effectiveness and Transparency Act*, contains two provision aimed at providing better information on how to make taxpayer-funded investments in STEM and research and development more effective, transparent, and fair.

First, the bill requires the National Science Foundation for the first time to report and make recommendations to Congress regarding the effectiveness of its research and education programs aimed at broadening the participation of women and historically underrepresented individuals and minorities in STEM. This report will give Congress, NSF, and other stakeholders objective information about what kinds of interventions and assistance are efficient, scalable, and effective.

In order to have a vibrant economy that provides opportunity and prosperity for all, we must be the leader in STEM fields. To do that, we need to develop the talent of all Americans. We cannot afford to leave anyone behind. This report will help us focus resources on the best and most effective methods.

Second, the bill requires all Federal science agencies to collect standardized information, including demographics, for each application received for research and development grants. Agencies are to submit the information annually to NSF, which is directed to publish an annual statistical summary. This information will provide better transparency to how taxpayer dollars are spent on research and scientists across the Federal Government.

I want to thank Ranking Member Johnson for joining me in sponsoring this bill and for her longtime commitment to ensuring STEM opportunities and advancement for all.

Thank you, Mr. Chairman, for your support as well, and I yield back.

PREPARED STATEMENT OF MRS. COMSTOCK

Mr. Chairman, H.R. 4375, the *STEM Research and Education Effectiveness and Transparency Act*, contains two provisions aimed at providing better information on how to make taxpayer-funded investments in STEM and research and development more effective, transparent and fair. First, the bill requires the National Science Foundation (NSF) - for the first time - to report and make recommendations to Congress regarding the effectiveness of its research and education programs aimed at broadening the participation of women and historically underrepresented individuals and minorities in STEM.

This report will give Congress, NSF and other stakeholders objective information about what kinds of interventions and assistance are efficient, scalable and effective.

In order to have a vibrant economy that provides opportunity and prosperity for all, we must be the leader in STEM fields. To do that, we need to develop the talent of all Americans. We cannot afford to leave anyone behind. This report will help us focus resources on the best and most effective methods.

Second, the bill requires all federal science agencies to collect standardized information, including demographics, for each application received for research and developments grants. Agencies are to submit the information annually to NSF, which is directed to publish an annual statistical summary.

This information will provide better transparency to how taxpayer dollars are spent on research and scientists across the federal government.

I want to thank Ranking Member Johnson for joining me in sponsoring this bill and for her longtime commitment to ensuring STEM opportunities and advancements for all. Thank you, Mr. Chairman, for your support as well.

Chairman SMITH. Thank you, Mrs. Comstock.

And the Ranking Member, the gentlewoman from Texas and original cosponsor of the legislation, is recognized for her opening statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman, and I want to thank Congresswoman Comstock for introducing H.R. 4375, the *STEM Research and Education Effectiveness Transparency Act*. I'm pleased to cosponsor this good legislation. H.R. 4375 is a small but important step forward for addressing longstanding gaps in achievement and participation in the sciences.

Research has shown that the observed shortages of women and minorities in STEM fields are not due to the lack of interest. To better understand the barriers faced by women and underrepresented minority groups in STEM, researchers and policymakers need access to better data on what really works to improve the recruitment and retention of women and minorities in STEM studies and careers. Importantly, we must also collect data that would reveal any inequities that originate within the Federal agencies themselves, even if unintentionally.

The bill directs the National Science Foundation to compile and report on all available data on the effectiveness of its portfolio of broadening participation programs. National Science Foundation must also identify what additional data would be needed to understand what makes programs effective. I commend NSF on the strides it has taken in recent years to accelerate its efforts to address the underrepresentation of women and minorities in STEM, but we need to ensure that they are producing results.

This bill also includes one provision from my *STEM Opportunities Act* that requires all Federal science agencies to collect and report annually on data for all research grant applications and awards. These data are essential to uncovering my inequities—any inequities in Federal funding for STEM research and to developing smart policies to address the implicit biases that are typically behind such inequities.

I continue to ask my good friend, Chairman Smith——

Chairman SMITH. Yes.

Ms. JOHNSON [continuing]. My hero here, to take up the entire——

Chairman SMITH. Get that down in writing fast.

Ms. JOHNSON [continuing]. Of my *STEM Opportunities Act*, which has been very well vetted by many experts, and I'm encouraged by this first small step.

I will say that I started this when Ms.—when Congresswoman Connie Morella and I did our first study on this Committee, and I'm still pleading for the same goal.

Thank you and I yield back. Do this before you leave. Thank you.

PREPARED STATEMENT OF MS. JOHNSON

I want to thank Chairwoman Comstock for introducing H.R. 4375, the *STEM Research and Education Effectiveness Transparency Act*. I am pleased to cosponsor this good legislation. H.R. 4375 is a small but important step forward for addressing long-standing gaps in achievement and participation in the sciences. Research has shown that the observed shortages of women and minorities in STEM fields are not due to a lack of interest. To better understand the barriers faced by women and underrepresented minority groups in STEM, researchers and policy-makers need access to better data on what really works to improve the recruitment and retention of women and minorities in STEM studies and careers. Importantly, we must also collect data that would reveal any inequities that originate within the federal agencies themselves, even if unintentionally. The bill directs the National Science Foundation to compile and report on all available data on the effectiveness of its portfolio of broadening participation programs. NSF must also identify what additional data would be needed to understand what makes programs effective. I commend NSF on the strides it has taken in recent years to accelerate its efforts to address the underrepresentation of women and minorities in STEM, but we need to ensure they are producing results. This bill also includes one provision from my *STEM Opportunities Act* that requires all federal science agencies to collect and report annually on data for all research grant applications and awards. These data are essential to uncovering any inequities in federal funding for STEM research, and to developing smart policies to address the implicit biases that are typically behind such inequities. I continue to ask my friend Chairman Smith to take up the entirety of my *STEM Opportunities Act*, which has been very well vetted by many experts. I am encouraged by this first small step, so I won't give up. Thank you, I yield back the balance of my time.

Chairman SMITH. Thank you, Ms. Johnson. We will renew our efforts and take another look and give it a good-faith effort.

If there is no further discussion, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4375 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 4375 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table, and H.R. 4375 is ordered reported to the House.

I ask unanimous consent that the staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

H.R. 4323

Next up, H.R. 4323. And pursuant to notice, I call up H.R. 4323, the *Supporting Veterans in STEM Careers Act*. And the clerk will report the bill.

The CLERK. H.R. 4323, a bill to promote veteran involvement in STEM education, computer science, and scientific research, and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

I'll now recognize the sponsor of the bill, Mr. Dunn, for his opening statement.

Mr. DUNN. Thank you very much, Mr. Chairman.

H.R. 4223, the Supporting Veterans in *STEM Careers Act*——

Chairman SMITH. Wait a minute.

Mr. DUNN. Come back on. The *Supporting Veterans in STEM Careers Act* is about helping expand veterans' job and education opportunities in the sciences. The bill requires the National Science Foundation to develop a veterans' outreach plan and publish data on veterans' participation in science, technology, engineering, and mathematics fields in its annual indicators report.

The bill also updates the NSF Noyce Teacher Scholarship program, fellowship programs, and cyber grant programs to include outreach to veterans.

Additionally, the White House Office of Science and Technology Policy is tasked with overseeing an interagency working group examining how to increase veteran participation in STEM career fields, including addressing any barriers to servicemembers and their spouses.

In the next 5 years, between 1 and 1.5 million members of the U.S. Armed Forces will leave the military according to the DOD. Many of these veterans will be seeking new careers by—and by a wide margin, veterans cite finding employment as their number-one need when returning home.

According to U.S. Bureau of Labor Statistics, occupations in the STEM fields is projected to grow to more than 9 million by 2020, an increase of a million jobs. Research shows that many military veterans have skills and training that align with STEM careers, particularly in information technology. However, it also shows that veterans face many barriers as they reenter the work force, including a lack of formal STEM education career guidance and the difficult task of transferring military credits to civilian college credits.

Our nation's veterans deserve every opportunity to transition to a healthy and successful civilian life, and this bill will help our servicemembers continue to serve our Nation in new ways by filling 21st century jobs and keeping America on the cutting edge of innovation.

I thank Mr. Takano, the Ranking Vice Chair of the Veterans Affairs Committee that we both have the privilege to serve on, for cosponsoring this bipartisan legislation. And I salute my fellow veterans on the Committee who join me in introducing this bill.

And thank you, Mr. Chairman, for your support as well. I urge my colleagues to support the bill, and I yield back.

PREPARED STATEMENT OF MR. DUNN

H.R. 4223, the *Supporting Veterans in STEM Careers Act*, is about helping expand veterans' job and education opportunities in the sciences.

The bill requires the National Science Foundation (NSF) to develop a veterans' outreach plan and publish data on veterans' participation in science, technology, engineering and mathematics (STEM) fields in its annual "Indicators" report.

The bill also updates the NSF Noyce Teacher Scholarship program, fellowship programs and cyber grant programs to include outreach to veterans.

Additionally, the White House Office of Science and Technology Policy is tasked with overseeing an interagency working group to examine how to increase veteran participation in STEM career fields, including addressing any barriers for service members and their spouses.

In the next five years, between one and 1.5 million members of the U.S. Armed Forces will leave the military, according to the Department of Defense. Many of these veterans will be seeking new careers; by a great margin, veterans cite finding employment as their number one need when returning home.

According to the U.S. Bureau of Labor and Statistics, occupations in STEM is projected to grow to more than 9 million between 2012 and 2022, an increase of about one million jobs.

Research shows that many military veterans have skills and training that align with STEM careers, particularly in information technology (IT). However, research also shows veterans face many barriers as they re-enter the workforce, including a lack of formal STEM education, career guidance and the difficult task of transferring military credits to college credits.

Our nation's veterans deserve every opportunity to transition to a healthy and successful civilian life. This bill will help our service members to continue to serve our nation in new ways by filling 21st century jobs and keeping America on the cutting edge of innovation.

I thank Mr. Takano, the Ranking Vice Chair of the Veterans Affairs Committee that we both have the privilege to serve on, for co-sponsoring this bipartisan legislation. And I salute my fellow veterans on the committee who joined my in introducing this bill.

Thank you, Mr. Chairman, for your support as well.

Chairman SMITH. Thank you, Mr. Dunn.

And the gentleman from California, Mr. Takano, is recognized.

Mr. TAKANO. Thank you, Mr. Chairman.

I am pleased to offer my support for the bill being marked up today, the *Supporting Veterans STEM Careers Act*. I'm proud to offer this legislation with my colleague Mr. Dunn. And as the Vice Ranking Member of the Veterans Affairs Committee, I have seen firsthand both the difficulties veterans face trying to further their education and the impact their experiences can have on a variety of civilian fields.

I think everyone here agrees that we must find ways to improve higher education for veterans and the benefit veterans can have on the scientific and economic future of this country.

Our bill directs the National Science Foundation to develop a plan to get more veterans into its STEM education and research programs. In addition, it requires NSF to report available data on veterans participating in STEM fields, both the research and careers. NSF will also be required to seek veterans out for existing NSF programs, including the Noyce Teacher Scholarship program, and for cybersecurity-specific education and training programs. This bill also creates an interagency committee to help veterans and their spouses transition into STEM careers, including annual reporting on their progress.

For its part the NSF has been looking for ways to better integrate veterans into STEM fields, and I applaud their work. And I know all of us are looking forward to making more progress in this effort, and I think our bill is an important step forward. I think this is a great example of a win-win. We—when we empower veterans to succeed, everyone benefits.

Thank you, and I yield back, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Takano.

And the Ranking Member, the gentlewoman from Texas, is recognized for her statement.

Ms. JOHNSON. Thank you very much, Chairman.

I want to thank Mr. Dunn and Mr. Takano for introducing H.R. 4323, the *Supporting Veterans in STEM Careers Act*.

Veterans are an experienced group of dedicated individuals that far too long have remained a largely untapped source of talent in our Nation's STEM work force. Projections from the Bureau of Labor Statistics predict that work force needs in STEM fields like computer science are outpacing our capacity to educate and train students in the field. H.R. 4323 is a step toward forestalling these projected gaps by leveraging a pool of skilled veterans to strengthen our STEM work force.

I support this bill, and I urge my colleagues to support it as well. I yield back the balance of my time.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith. I want to thank Mr. Dunn and Mr. Takano for introducing H.R. 4323, the *Supporting Veterans in STEM Careers Act*.

Veterans are an experienced group of dedicated individuals that for far too long have remained a largely untapped source of talent in our nation's STEM workforce. Projections from the Bureau of Labor Statistics predict that workforce needs in STEM fields like computer science are outpacing our capacity to educate and train students in these fields.

H.R. 4323 is a step toward forestalling these projected gaps by leveraging the pool of skilled veterans to strengthen our STEM workforce.

I support this bill, and urge my colleagues to support it.

I yield back the balance of my time.

Chairman SMITH. Thank you, Ms. Johnson.

And the gentleman from California, Mr. Rohrabacher, is recognized.

Mr. ROHRABACHER. Thank you very much. Just a few thoughts when we're talking about this outreach to veterans that during the second world war—right now, we recognize the great contribution that Americans went overseas and fought for us, not just the contributions they made in the fighting but now it's recognized that that greatest generation came home and built the American economy. America was never the same after World War II because we had millions of men and women who now were educated and—which we reached out to make sure they were educated when they came back—and playing a very vital role in our economy. That greatest generation—so we're thankful to them not only for fighting the good fight overseas and protecting our country but for what they did to build our country afterwards.

While we have been at war now for 16 years, we are at war. We've had people out and we still have to this day men and women out with their lives on the line and it's disrupting their life and moving—and putting themselves at risk for us. They are making an enormous contribution like the World War II generation. Their contribution will be a great—even greater when they come home.

I believe that there's—that the veterans now, the millions—and I believe it's probably about the same number of veterans, but we have 16 years where they're spread out as the number of veterans we had in World War II. I think they have a major contribution to make to our country, and I really believe that what we're doing in this type of thing at this type of outreach reflects what we did

with the World War II generation. I want to make sure those men and women coming back from overseas, and some of them disabled, that all of them have an opportunity to make their contribution now and live good and decent lives in an economy that will be as different 10 years from now as our economy was 10 years after the second world war.

So with those—with that thought, I want to thank you for your leadership and the leadership of those in this Committee who are taking part in this debate but also thought out this idea of having the National Science Foundation outreach to those brave men and women who are coming home. Thank you very much.

Chairman SMITH. Thank you, Mr. Rohrabacher.

If there's no further discussion, a reporting quorum being present, I move that the Committee on—I'm sorry, the gentlewoman from Connecticut, Ms. Esty, is recognized.

Ms. ESTY. Thank you, Mr. Chairman.

As a fellow Member of both this Committee and the Veterans Affairs Committee, I wanted to lend my support as well.

We know that we need to do right by our veterans. Too many of our veterans are unemployed. They have a higher unemployment rate than civilians. That's wrong and it's shameful. We have a critical work force need in the STEM field and we have special skills that our veterans bring. Mr. Rohrabacher mentioned that, teambuilding skills, practical experience, and all of those we actually need and would benefit from.

So I'm really delighted to join my fellow colleagues on both House Veterans Affairs and this Committee Mr. Takano and Mr. Dunn in supporting this legislation and encourage us to do right by our veterans and do right for our country. Thank you very much, and I yield back.

Chairman SMITH. Thank you, Ms. Esty.

If there's no further discussion, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4323 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 4323 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table, and H.R. 4323 is ordered reported to the House.

And I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

H.R. 4254

Chairman SMITH. Pursuant to notice, I now call up H.R. 4254, the *Women in Aerospace Education Act*. And the clerk will report the bill.

The CLERK. H.R. 4254, a bill to amend the *National Science Foundation Authorization Act of 2002*, to strengthen the aerospace work force pipeline by the promotion of Robert Noyce Teacher Scholarship program and National Aeronautics and Space Adminis-

tration internship and fellowship opportunities to women, and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And the gentleman from California, Mr. Knight, is recognized for an opening statement.

Mr. KNIGHT. Thank you, Mr. Chairman.

This is an important initiative to strengthen our aerospace work force. H.R. 4253, the *Women in Aerospace Education Act*, directs the National Science Foundation, through the Robert Noyce Scholarship program and NASA to shape their fellowship and internship opportunities to encourage more women to get aerospace experience while they're training to be teachers.

Female aerospace professionals must be placed in the classroom at greater numbers. A full 1/5 of U.S. aerospace engineers are of retirement age today. They are beginning to exit our work force, which would create an enormous shortfall in our national security preparedness.

Meanwhile, women represent only about 1/4 of all STEM workers and represent about 15 percent of all aerospace engineers. We need to improve our STEM education pipeline from ensuring STEM classes are available to students at a young age to encourage young Americans to pursue STEM education all the way through to the completion of their degree. But the gender gap that is so prevalent in this industry will persist until we make STEM and aerospace more inclusive of women and encourage women at a young age to pursue these fields.

Attitudes about career paths are formed at a young age. The role models and leaders from which women learn have an enormous impact on future decisionmaking. I introduced the *Women in Aerospace Education Act* to make better use of some of the Federal Government's best teacher training programs to increase the number of women teachers who have seen, worked on, and can relate the Nation's leading aerospace programs to young female students.

Robert Noyce scholars who get teacher certification assistance from the National Science Foundation are already in small numbers getting experience in NASA centers and the national labs. Once they become certified and go to teach in our K–12 system, they draw upon the work they have did—they did on major public initiatives in science and technology. Schools love having Noyce program teachers because their strong positive attitudes about STEM are cultivated in their students. It will strengthen our STEM pipeline to enhance the connection between the Noyce Scholarship program and our schools.

The second provision of this bill directs NASA to more actively promote its internship and fellowship opportunities to women or members of other historically underrepresented groups. Together, the two provisions of this bill will help make a necessary and fundamental shift in our education system and aerospace work force pipeline that will prove critical to our national security in the long run.

I encourage my colleagues to support this legislation. I'd like to thank Ms. Esty for her partnership on this bill, and I yield the remainder of my time.

PREPARED STATEMENT OF MR. KNIGHT

Thank you, Mr. Chairman, for the time to speak in support of an important initiative to strengthening our aerospace workforce.

H.R. 4253, the *Women in Aerospace Education Act*, directs the National Science Foundation, through the Robert Noyce Scholarship Program, and NASA to shape their fellowship and internship opportunities to encourage more women to get aerospace experience while they're training to be teachers.

Female aerospace professionals must be placed in the classroom in greater numbers.

A full fifth of U.S. aerospace engineers are of retirement age today. They are beginning to exit our workforce, which will create an enormous shortfall in our national security preparedness.

Meanwhile, women represent only about one-quarter of all STEM workers and represent about 15 percent of all aerospace engineers.

We need to improve our STEM education pipeline, from ensuring STEM classes are available to students at a young age to encouraging young Americans pursue STEM education all the way through to the completion of their degree.

But the gender gap that is so prevalent in this industry will persist until we make STEM and aerospace more inclusive of women and encourage women at a young age to pursue these fields.

Attitudes about career paths are formed at a young age.

The role models and leaders from which young women learn have an enormous impact on future decision-making.

I introduced the *Women in Aerospace Education Act* to make better use of some of the federal government's best teacher training programs to increase the number of women teachers who have seen, worked on and can relate the nation's leading aerospace programs to young female students.

Robert Noyce scholars, who get teacher certification assistance from the National Science Foundation, are already in small numbers getting experience in NASA Centers and the National Labs.

Once they become certified and go to teach in our K-12 system, they draw upon the work they did on major public initiatives in science and technology. Schools love having Noyce program teachers because their strong positive attitudes about STEM are cultivated in their students.

It will strengthen our STEM pipeline to enhance the connection between the Noyce scholarship program and our schools.

The second provision of this bill directs NASA to more actively promote its internship and fellowship opportunities to women or members of other historically underrepresented groups.

Together, the two provisions of this bill will help make a necessary and fundamental shift in our education system and aerospace workforce pipeline that will prove critical to our national security in the long run.

I encourage my colleagues to support this legislation. I'd like to thank Ms. Esty for her help on this bill and I yield the remainder of my time.

Chairman SMITH. Thank you, Mr. Knight.

And the gentlewoman from Connecticut, Ms. Esty, is recognized for her statement.

Ms. ESTY. Thank you, Mr. Chairman. I'm proud to be introducing this legislation with my colleague, Mr. Knight, and I want to thank him for his work on this.

And, Mr. Chairman, I want to thank you for cosponsoring this bill. And to my colleague Mrs. Comstock, we've worked together on these bills for number of years and it's always great to see more good bipartisan work out of this Committee.

One of our common goals on the Science Committee is to inspire more young people and particularly more young women to pursue careers in the sciences. And at this moment we have a long way to go in the aerospace field. We're rapidly facing a critical shortage of skilled aerospace workers. According to a 2015 aviation week work force study, 28 percent of the aerospace work force is 56 years old or older, and nearly 1/5 of our aerospace engineers are now eli-

gible for retirement, and we simply cannot fill those positions unless we broaden and deepen our pool of skilled workers.

Moreover, women represent only about 1/4 of all STEM workers and represent only 15 percent of all aerospace engineers, and that's why Representative Knight and I introduced the *Women in Aerospace Education Act*, to address both the critical work force needs and to bridge the gender gap in the aerospace industry.

One of the key objectives of the *Women in Aerospace Education Act* is to equip more women with well-rounded working and learning experiences in aerospace engineering. Specifically, the *Women in Aerospace Education Act* would encourage universities applying for Noyce grants to incorporate aerospace working and learning experiences at the national laboratories and NASA centers for their fellowship programs. Robert Noyce Teaching Scholarship grants are used by universities to cover the cost of STEM-degree students who go on to teach in rural or lower-income school districts.

Taking it a step further, our bill allows the National Science Foundation director to prioritize proposals for Noyce grants to provide female fellows with research experience in aerospace engineering. These teachers will then enter the classroom with firsthand knowledge of the impact aerospace programs have on our lives and share their passion and their inspiration with their students. It's proven, as my colleague Mr. Knight mentioned, that girls who have women science teachers are more likely to get interested in science.

Additionally, this bill directs NASA to prioritize the recruitment of women and minority candidates to apply for internships and fellowships at NASA.

I recently had a chance to visit United Technology Corporation Aerospace Systems, UTAS, in Connecticut to learn more about the ways Connecticut companies like UTAS and Ensign-Bickford are supporting NASA's deep space exploration missions. When I toured the facilities, I noticed that the engineers working on the critical Orion components there were virtually all men and virtually all in their late 40's and 50's. I met Erica Abrahamson, a young woman who is the Deputy Program Director for UTAS's portion of the Orion deep space project, and she shared UTAS's concerns about the aging work force. She and others at UTAS are looking down the line, and they know if they don't diversify their work force, they'll have a major shortage.

And we will never be able to retain our competitive edge in science as a country or to meet critical STEM work force needs unless we bring more women to the table. In Congress, we recognize that need and we're taking steps to address it.

I want to thank my colleague, Congressman Knight, again for his leadership on this bill on this important issue. I urge my colleagues to support the *Women in Aerospace Education Act*, and I yield back.

Chairman SMITH. Thank you, Ms. Esty.

And the gentlewoman from Texas, the Ranking Member, is recognized for her statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

I want to thank Mr. Knight and Ms. Esty for introducing H.R. 4254, the *Women in Aerospace Education Act*. This year, we saw NASA Astronaut Peggy Whitson break the record for cumulative

time spent in space by a U.S. astronaut. Dr. Whitson is an inspiration for girls pursuing aerospace careers, but her success is not entirely shared by women throughout the aerospace sector. The Bureau of Labor Statistics reports that in 2016 women made up only 8 percent of the aerospace engineers. H.R. 4254 will help address the underrepresentation of women in aerospace.

I strongly support the passage of this bill, and I urge my colleagues to join me, as well as the rest of the Committee.

Thank you, Mr. Chairman, and I yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith. I want to thank Mr. Knight and Ms. Esty for introducing H.R. 4254, the *Women in Aerospace Education Act*.

This year we saw NASA astronaut Peggy Whitson break the record for cumulative time spent in space by a U.S. astronaut. Dr. Whitson is an inspiration for girls pursuing aerospace careers, but her success is not widely shared by women throughout the aerospace sector. The Bureau of Labor Statistics reports that in 2016, women made up only 8 percent of aerospace engineers. H.R. 4254 will help address the underrepresentation of women in aerospace.

I strongly support passage of this bill, and I urge my colleagues to support it as well.

I yield back the balance of my time.

Chairman SMITH. Thank you, Ms. Johnson.

And the gentleman from California, Mr. Knight, is recognized for the purpose of offering an amendment.

Mr. KNIGHT. Mr. Chairman, I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 4254 offered by Mr. Knight of California, amendment number 037, page 2, line 3——

Chairman SMITH. Without objection, the amendment is considered as read, and Mr. Knight is recognized to explain his amendment.

Mr. KNIGHT. Mr. Chairman, my amendment makes modifications in response to feedback from the National Science Foundation and the Committee. The amendment gives Noyce scholars who are undergraduates and Noyce fellows who are working to obtain their master's degrees the opportunity to pursue research internships at NASA centers and national laboratories. These Noyce scholars and fellows who go on to become teachers can then take that experience back into the classroom and inspire students to go into aerospace jobs.

I appreciate the National Science Foundation and the Committee working with us on this bill. I urge the adoption of this amendment and yield back.

Chairman SMITH. Thank you, Mr. Knight. I recommend our colleagues here support the amendment as well.

And is there anyone else who seeks to be recognized?

If not, the question is on agreeing to the amendment.

All in favor, say aye.

All opposed, no.

The ayes have it, and the amendment is agreed to.

And if there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4254 to the House, as amended, with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 4254 to the House, as amended.

All in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 4254 is ordered reported to the House.

I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. And without objection, so ordered.

H.R. 3397

Chairman SMITH. Pursuant to notice, I now call up H.R. 3397, the *Building Blocks of STEM Act*. And the clerk will report the bill.

The CLERK. H.R. 3397, a bill to direct the National Science Foundation to support STEM education research focused on early childhood.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And I'll recognize the sponsor of the bill, Ms. Rosen, for her opening statement.

Ms. ROSEN. Thank you, Chairman Smith and Ranking Member Johnson, for holding today's markup on several STEM education bills, including one of mine, the *Building Blocks of STEM Act*. I also want to thank my colleague from across the aisle, Steve Knight, for collating this important legislation with me.

STEM and computer science are central to our country's innovation, economic growth, and employment. In my home State of Nevada and across the country we are continuing to see a huge demand for workers in the tech industry, including software developers, engineers, and computer programmers like me. According to the Bureau of Labor Statistics, STEM jobs are estimated to grow by 12 percent between now and 2024, faster than all other occupations. Despite these increasing opportunities in STEM careers, too few Americans possess the education and skills necessary to succeed.

This disparity between computing and scientific talent and demand begins back in elementary school. Studies have found that children who engage in scientific activities from an early age develop positive attitudes toward science and are more likely to pursue STEM careers later on. In fact, interviews with current graduate students and scientists found that the majority of them reported that their interest in science began before middle school.

The bill before us today, the *Building Blocks of STEM Act*, will ensure that we're investing in our children as early as possible by directing National Science Foundation to equitably distribute funding across groups, including early childhood and its Discovery Research Pre-K–12 program. While this program seeks to enhance the learning and teaching of STEM, the majority of its current research focuses on students in middle school and older. My bill ensures that NSF focuses on engaging our Nation's children in STEM education even younger.

I'm also grateful that the manager's amendment, introduced by Subcommittee Chairwoman Barbara Comstock, will incorporate

into this legislation another STEM bill of mine, the *Code Like a Girl Act*, which I introduced alongside Representative Elise Stefanik and of which Mrs. Comstock is a cosponsor.

We all know the gender gap in STEM work force is widening, particularly in computer science where women hold only about 26 percent of computing-relating—related occupations even though we make up more than half of the work force. This gender disparity extends down through all levels of education. In the last few years, approximately 23 percent of AP computer science exam takers were girls, and about only 18 percent of computer science bachelor's degrees went to women.

Gender stereotypes begin at a very early age. Studies have shown that around 6 years old girls develop the belief that brilliance is a male characteristic, and this negative stereotype is shown to have an immediate effect. The *Code Like a Girl Act* addresses this issue by creating NSF grants to increase understanding of the factors that contribute to the participation of young girls 10 and under in STEM and computer science activities, and this bill also creates a grant program to develop and evaluate interventions in pre-K and elementary school classrooms that seek to increase participation of young girls in computer science.

By increasing the number of women in computer science careers, we diversify the qualified pool that the United States relies on for innovation. This will help us maintain our global competitiveness and expand our economy. So we shouldn't deprive our country of talented minds that could be working on our Nation's most challenging problems, talented young minds that could be inventing the next breakthrough technology, founding future startups, and keeping our Nation safe from cyber attacks. So for those reasons I am proud that my *Code Like a Girl Act* is being included in the *Building Blocks of STEM Act* and that we are one step closer to bridging our current gaps in STEM education and work force training. I urge my colleagues to support this legislation, and I yield back my time.

Chairman SMITH. Thank you, Ms. Rosen.

And the gentleman from California, Mr. Knight, is recognized.

Mr. KNIGHT. Thank you, Mr. Chairman.

I speak in support of H.R. 3397, a bipartisan bill that I am proud to sponsor with Ms. Jacky Rosen. Investing in our children and their future is always an opportunity for good. Expanding the reach of our STEM education programs to children of all ages will create a greater future in innovation. Research shows that children at a very young age are capable of absorbing STEM concepts, and any parent can tell you that shortly after kids learn to talk, the questions can be endless. Children have a natural curiosity that can be fostered into an interest in science, technology, engineering, math, and computer science.

The bill directs NSF to more equitably allocate funding for research and studies that focus on early childhood, investing in children early, ensuring we are laying the groundwork to develop young innovators in STEM.

I want to thank Ms. Rosen for her work on this bill and thank the Chairman for his support, and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Knight.

And the gentlewoman from Texas, the Ranking Member, is recognized for her statement.

Ms. JOHNSON. Thank you very much, Chairman Smith. I want to thank Ms. Rosen and Mrs. Comstock for introducing 37—3397, the *Building Blocks of STEM Act*. Ms. Rosen has been a champion for increasing the participation of girls in computer science since she joined the Science Committee, and I commend her for her efforts.

A research article published in the journal Science earlier this year revealed that girls begin to view intelligence as a male trait as early as 6 years old. This attitude has a profound impact on educational and career choices made by young women. H.R. 3397 directs the National Science Foundation to support research into factors that contribute to the early adoption of these stereotypes and scalable models for intervention to prevent or reverse the effects of these negative and erroneous stereotypes. This legislation is good for this Nation. I strongly support this bill and urge my colleagues to support it as well.

I thank you and yield back the balance of my time.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith. I want to thank Ms. Rosen and Ms. Comstock for introducing H.R. 3397, the *Building Blocks of STEM Act*. Ms. Rosen has been a champion for increasing the participation of girls in computer science since she joined the Science Committee, and I commend her for her efforts. A research article published in the journal Science earlier this year revealed that girls begin to view intelligence as a male trait as early as 6 years old. This attitude has a profound impact on educational and career choices made by young women.

H.R. 3397 directs NSF to support research into factors that contribute to the early adoption of these stereotypes and scalable models for intervention to prevent or reverse the effects of these negative and erroneous stereotypes.

I strongly support this bill and urge my colleagues to support it.

I yield back the balance of my time

Chairman SMITH. Thank you, Ms. Johnson.

We have an amendment in the nature of a substitute to be offered by Mrs. Comstock, and she is recognized for that purpose.

Mrs. COMSTOCK. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 3387 offered by Mrs. Comstock of Virginia, amendment number 001. Strike all after the enacting clause and insert the following.

Chairman SMITH. The gentlewoman from Virginia is—continues to be recognized.

Mrs. COMSTOCK. This amendment adds two provisions to the *Building Blocks of STEM Act*. The first is a section on supporting girls in STEM education and computer science based on legislation that I cosponsored with Mrs. Rosen earlier this year, as was mentioned. The provision directs the National Science Foundation to research the role of teachers and other mentors in girls' perception of and participation in science.

I have seen firsthand the important role that mentors can play in helping inspire young women through my own Young Women's Leadership Program that I run in my district in the summer and is important to learn how that impacts girls long-term in STEM.

I was also pleased to be able to participate recently in a coding program in a disadvantaged school in my district, and you'll be happy to know that the kindergartners were doing coding. They had a great little program that they had and these—and the girls were in there and it's exactly—it's coding like a girl right from kindergarten. It was really exciting to see that.

The provision also directs NSF to develop scalable models to increase young girls' participation. Although women fill close to half of all jobs in the U.S. economy, they hold less than 25 percent of all STEM jobs, so this obviously can start changing this from kindergarten or even before.

Finally, the amendment includes a provision to add informatics and computer science to the definition of STEM in the Noyce Teacher program. Informatics, the science of processing data for storage and retrieval, is one of the fastest-growing STEM career fields. The Bureau of Labor Statistics projects the number of health informatics specialists to grow 15 percent by 2024, which is faster than the projected job growth of all other U.S. professions. We need teachers trained to understand this growing field and to develop the next generation of workers.

Thank you, Mrs. Rosen, for working with us to come to agreement on this language. Together, these provisions will provide many building blocks for STEM, and I urge my colleagues to support the amendment. And I yield back.

Chairman SMITH. Thank you, Mrs. Comstock.

And is there any further discussion on the amendment?

If not, the question is on agreeing to the manager's amendment.

All in favor, say aye.

Those opposed, no.

The ayes have it, and the amendment is agreed to.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 3397 to the House, as amended, with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 3397 to the House, as amended.

All those in favor, say aye.

It's getting weaker and weaker as we go along.

All opposed, no.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 3397 is ordered reported to the House.

I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

Before we adjourn, I just want to thank all the Members who have been here today and hesitate to single out any particular group, but I will say we had almost full attendance looking to my left today, and that was very much appreciated. And we still have a number of people here as well. Looking to my right, we have the author of the bill and two Texans, which is always a good combination to have.

Ms. JOHNSON. They're back in the cloakroom.

Chairman SMITH. Well, they're back in the cloakroom Ms. Johnson says.

If there's no further discussion, that completes our business. This concludes the markup today. Without objection, we stand adjourned.

[Whereupon, at 11:21 a.m., the Committee was adjourned.]

Appendix:

H.R. 4376, H.R. 4377, H.R. 4378, H.R. 4375, H.R. 4323, H.R. 4254, AMENDMENT ROSTER, H.R. 3397, AMENDMENT ROSTER

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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To direct the Secretary of Energy to carry out certain upgrades to research equipment and the construction of a research user facility, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. KNIGHT introduced the following bill; which was referred to the Committee on _____

A BILL

To direct the Secretary of Energy to carry out certain upgrades to research equipment and the construction of a research user facility, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Department of Energy Research Infrastructure Act of 2017".

SEC. 2. ADVANCED LIGHT SOURCE UPGRADE.

(a) IN GENERAL.—The Secretary of Energy shall provide for the upgrade to the Advanced Light Source de-

1 scribed in the publication approved by the Basic Energy
2 Sciences Advisory Committee on June 9, 2016, titled "Re-
3 port on Facility Upgrades", including the development of
4 a multi-bend achromat lattice to produce a high flux of
5 coherent x-rays within the soft x-ray energy region.
6 (b) DEFINITIONS.—In this section:
7 (1) FLUX.—The term "flux" means the rate of
8 flow of photons.
9 (2) SOFT X-RAY.—The term "soft x-ray" means
10 a photon with energy in the range from 50 to 2,000
11 electron volts.
12 (c) START OF OPERATIONS.—The Secretary shall, to
13 the maximum extent practicable, ensure that the start of
14 full operations of the upgrade under this section occurs
15 before December 31, 2026.
16 (d) FUNDING.—Out of funds appropriated to the Of-
17 fice of Science, there shall be made available to the Sec-
18 retary to carry out the upgrade under this section—
19 (1) $20,000,000 for fiscal year 2018;
20 (2) $50,000,000 for fiscal year 2019;
21 (3) $80,000,000 for fiscal year 2020;
22 (4) $80,000,000 for fiscal year 2021;
23 (5) $52,000,000 for fiscal year 2022;
24 (6) $22,000,000 for fiscal year 2023; and
25 (7) $6,000,000 for fiscal year 2024.

1 **SEC. 3. LINAC COHERENT LIGHT SOURCE II HIGH ENERGY**
2 **UPGRADE.**

3 (a) IN GENERAL.—The Secretary of Energy shall
4 provide for the upgrade to the Linac Coherent Light
5 Source II facility described in the publication approved by
6 the Basic Energy Sciences Advisory Committee on June
7 9, 2016, titled "Report on Facility Upgrades", including
8 the development of experimental capabilities for high en-
9 ergy x-rays to reveal fundamental scientific discoveries.
10 The Secretary shall ensure the upgrade under this section
11 enables the production and use of high energy, ultra-short
12 pulse x-rays delivered at a high repetition rate.

13 (b) DEFINITIONS.—In this section:

14 (1) HIGH ENERGY X-RAY.—The term a "high
15 energy x-ray" means a photon with an energy at or
16 exceeding 12 kiloelectron volts.

17 (2) HIGH REPETITION RATE.—The term "high
18 repetition rate" means the delivery of x-ray pulses
19 up to one million pulses per second.

20 (3) ULTRA-SHORT PULSE X-RAYS.—The term
21 "ultra-short pulse x-rays" means x-ray bursts capa-
22 ble of durations of less than one hundred
23 femtoseconds.

24 (c) START OF OPERATIONS.—The Secretary shall, to
25 the maximum extent practicable, ensure that the start of

1 full operations of the upgrade under this section occurs
2 before December 31, 2025.
3 (d) FUNDING.—Out of funds appropriated to the Of-
4 fice of Science, there shall be made available to the Sec-
5 retary to carry out the upgrade under this section—
6 (1) $20,000,000 for fiscal year 2018;
7 (2) $55,000,000 for fiscal year 2019;
8 (3) $80,000,000 for fiscal year 2020;
9 (4) $80,000,000 for fiscal year 2021;
10 (5) $54,000,000 for fiscal year 2022; and
11 (6) $31,000,000 for fiscal year 2023.
12 **SEC. 4. FACILITY FOR RARE ISOTOPE BEAMS.**
13 (a) IN GENERAL.—The Secretary of Energy shall
14 provide for a Facility for Rare Isotope Beams to advance
15 the understanding of rare nuclear isotopes and the evo-
16 lution of the cosmos.
17 (b) FACILITY CAPABILITY.—In carrying out sub-
18 section (a), the Secretary shall provide for, at a minimum,
19 a rare isotope beam facility capable of 400 kW of beam
20 power.
21 (c) START OF OPERATIONS.—The Secretary shall, to
22 the maximum extent practicable, ensure that the start of
23 full operations of the facility under this section occurs be-
24 fore June 30, 2022, with early operation in 2018.

1 (d) FUNDING.—Out of funds appropriated to the Of-
2 fice of Science, there shall be made available to the Sec-
3 retary to carry out activities, including construction of the
4 facility, under this section—
5 (1) $101,000,000 for fiscal year 2018;
6 (2) $103,000,000 for fiscal year 2019;
7 (3) $104,000,000 for fiscal year 2020;
8 (4) $105,000,000 for fiscal year 2021; and
9 (5) $106,000,000 for fiscal year 2022.

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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To direct the Secretary of Energy to carry out an upgrade to research equipment and construct research user facilities, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. HULTGREN introduced the following bill; which was referred to the Committee on _____

A BILL

To direct the Secretary of Energy to carry out an upgrade to research equipment and construct research user facilities, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Accelerating American Leadership in Science Act of 2017".

SEC. 2. ADVANCED PHOTON SOURCE UPGRADE.

(a) IN GENERAL.—The Secretary of Energy shall provide for the upgrade to the Advanced Photon Source

1 described in the publication approved by the Basic Energy
2 Sciences Advisory Committee on June 9, 2016, titled "Re-
3 port on Facility Upgrades", including the development of
4 a multi-bend achromat lattice to produce a high flux of
5 coherent x-rays within the hard x-ray energy region and
6 a suite of beamlines optimized for this source.

7 (b) DEFINITIONS.—In this section:

8 (1) FLUX.—The term "flux" means the rate of
9 flow of photons.

10 (2) HARD X-RAY.—The term "hard x-ray"
11 means a photon with energy greater than 20
12 kiloelectron volts.

13 (c) START OF OPERATIONS.—The Secretary shall, to
14 the maximum extent practicable, ensure that the start of
15 full operations of the upgrade under this section occurs
16 before December 31, 2025.

17 (d) FUNDING.—Out of funds appropriated to the Of-
18 fice of Science, there shall be made available to the Sec-
19 retary to carry out the upgrade under this section—

20 (1) $93,000,000 for fiscal year 2018;

21 (2) $130,000,000 for fiscal year 2019;

22 (3) $152,400,000 for fiscal year 2020;

23 (4) $150,000,000 for fiscal year 2021;

24 (5) $73,600,000 for fiscal year 2022; and

25 (6) $20,000,000 for fiscal year 2023.

SEC. 3. LONG-BASELINE NEUTRINO FACILITY FOR DEEP UNDERGROUND NEUTRINO EXPERIMENT.

(a) IN GENERAL.—The Secretary of Energy shall provide for a Long-Baseline Neutrino Facility to facilitate the international Deep Underground Neutrino Experiment to enable a program in neutrino physics to measure the fundamental properties of neutrinos, explore physics beyond the Standard Model, and better clarify the nature of matter and antimatter.

(b) FACILITY CAPABILITIES.—The Secretary shall ensure that the facility described in subsection (a) will provide, at a minimum, the following capabilities:

(1) A broad-band neutrino beam capable of 1.2 megawatts (MW) of beam power and upgradable to 2.4 MW of beam power.

(2) Four caverns excavated for a forty kiloton fiducial detector mass and supporting surface buildings and utilities.

(3) Neutrino detector facilities at both the Far Site in South Dakota and the Near Site in Illinois to categorize and study neutrinos on their 800-mile journey between the two sites.

(4) Cryogenic systems to support neutrino detectors.

(c) START OF OPERATIONS.—The Secretary shall, to the maximum extent practicable, ensure that the start of

1 full operations of the facility under this section occurs be-
2 fore December 31, 2026.

3 (d) FUNDING.—Out of funds appropriated to the Of-
4 fice of Science, there shall be made available to the Sec-
5 retary to carry out activities, including construction of the
6 facility, under this section—

7 (1) $95,000,000 for fiscal year 2018;
8 (2) $160,000,000 for fiscal year 2019;
9 (3) $195,000,000 for fiscal year 2020;
10 (4) $195,000,000 for fiscal year 2021;
11 (5) $200,000,000 for fiscal year 2022;
12 (6) $200,000,000 for fiscal year 2023;
13 (7) $195,000,000 for fiscal year 2024;
14 (8) $150,000,000 for fiscal year 2025; and
15 (9) $50,000,000 for fiscal year 2026.

16 **SEC. 4. SPALLATION NEUTRON SOURCE PROTON POWER**
17 **UPGRADE.**

18 (a) IN GENERAL.—The Secretary of Energy shall
19 provide for a proton power upgrade to the Spallation Neu-
20 tron Source.

21 (b) DEFINITION OF PROTON POWER UPGRADE.—
22 For the purposes of this section, the term "proton power
23 upgrade" means the Spallation Neutron Source power up-
24 grade described in—

(1) the publication of the Office of Science of the Department of Energy titled "Facilities for the Future of Science: A Twenty-year Outlook", published December 2003;

(2) the publication of the Office of Science of the Department of Energy titled "Four Years Later: An Interim Report on Facilities for the Future of Science: A Twenty-Year Outlook", published August 2007; and

(3) the publication approved by the Basic Energy Sciences Advisory Committee on June 9, 2016, titled "Report on Facility Upgrades".

(c) START OF OPERATIONS.—The Secretary shall, to the maximum extent practicable, ensure that the start of full operations of the upgrade under this section occurs before December 31, 2025.

(d) FUNDING.—Out of funds appropriated to the Office of Science, there shall be made available to the Secretary to carry out the upgrade under this section—

(1) $26,000,000 for fiscal year 2018;

(2) $70,800,000 for fiscal year 2019;

(3) $33,500,000 for fiscal year 2020;

(4) $40,500,000 for fiscal year 2021;

(5) $21,100,000 for fiscal year 2022;

(6) $13,200,000 for fiscal year 2023; and

1 (7) $2,900,000 for fiscal year 2024.

2 **SEC. 5. SPALLATION NEUTRON SOURCE SECOND TARGET**
3 **STATION.**

4 (a) IN GENERAL.—The Secretary of Energy shall
5 provide for a second target station for the Spallation Neu-
6 tron Source.

7 (b) DEFINITION OF SECOND TARGET STATION.—For
8 the purposes of this section, the term "second target sta-
9 tion" means the Spallation Neutron Source second target
10 station described in—

11 (1) the publication of the Office of Science of
12 the Department of Energy titled "Facilities for the
13 Future of Science: A Twenty-year Outlook", pub-
14 lished December 2003;

15 (2) the publication of the Office of Science of
16 the Department of Energy titled "Four Years Later:
17 An Interim Report on Facilities for the Future of
18 Science: A Twenty-Year Outlook", published August
19 2007; and

20 (3) the publication approved by the Basic En-
21 ergy Sciences Advisory Committee on June 9, 2016,
22 titled "Report on Facility Upgrades".

23 (c) START OF OPERATIONS.—The Secretary shall, to
24 the maximum extent practicable, ensure that the start of
25 full operations of the second target station under this sec-

1 tion occurs before December 31, 2030, with the option for
2 early operation in 2028.
3 (d) FUNDING.—Out of funds appropriated to the Of-
4 fice of Science, there shall be made available to the Sec-
5 retary to carry out activities, including construction, under
6 this section—
7 (1) $5,000,000 for fiscal year 2018;
8 (2) $10,000,000 for fiscal year 2019;
9 (3) $15,000,000 for fiscal year 2020;
10 (4) $25,000,000 for fiscal year 2021;
11 (5) $50,000,000 for fiscal year 2022;
12 (6) $200,000,000 for fiscal year 2023;
13 (7) $275,000,000 for fiscal year 2024;
14 (8) $275,000,000 for fiscal year 2025;
15 (9) $275,000,000 for fiscal year 2026;
16 (10) $250,000,000 for fiscal year 2027; and
17 (11) $120,000,000 for fiscal year 2028.

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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To direct the Secretary of Energy to carry out the construction of a versatile reactor-based fast neutron source, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. WEBER of Texas introduced the following bill; which was referred to the Committee on _____

A BILL

To direct the Secretary of Energy to carry out the construction of a versatile reactor-based fast neutron source, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Nuclear Energy Research Infrastructure Act of 2017".

SEC. 2. VERSATILE NEUTRON SOURCE.

(a) IN GENERAL.—The Secretary of Energy shall provide for a versatile reactor-based fast neutron source,

1 which shall operate as a national user facility. The Sec-
2 retary shall consult with the private sector, universities,
3 National Laboratories, and relevant Federal agencies to
4 ensure that the versatile neutron source is capable of
5 meeting Federal research needs for neutron irradiation
6 services.

7 (b) FACILITY CAPABILITIES.—

8 (1) CAPABILITIES.—The Secretary shall ensure
9 that the facility described in subsection (a) will pro-
10 vide, at a minimum, the following capabilities:

11 (A) Fast neutron spectrum irradiation ca-
12 pability.

13 (B) Capacity for upgrades to accommodate
14 new or expanded research needs.

15 (2) CONSIDERATIONS.—In carrying out para-
16 graph (1), the Secretary shall consider the following:

17 (A) Capabilities that support experimental
18 high-temperature testing.

19 (B) Providing a source of fast neutrons at
20 a neutron flux higher than that at which exist-
21 ing research facilities operate, sufficient to en-
22 able research for an optimal base of prospective
23 users.

1 (C) Maximizing irradiation flexibility and
2 irradiation volume to accommodate as many
3 concurrent users as possible.
4 (D) Capabilities for irradiation with neu-
5 trons of a lower energy spectrum.
6 (E) Multiple loops for fuels and materials
7 testing of different coolants.
8 (F) Capabilities that support irradiating
9 and processing targets for isotope production.
10 (G) Additional pre-irradiation and post-ir-
11 radiation examination capabilities.
12 (H) Lifetime operating costs and lifecycle
13 costs.
14 (c) START OF OPERATIONS.—The Secretary shall, to
15 the maximum extent practicable, ensure that the start of
16 full operations of the facility under this section occurs be-
17 fore December 31, 2025.
18 (d) FUNDING.—Out of funds appropriated to the Of-
19 fice of Nuclear Energy, there shall be made available to
20 the Secretary to carry out activities, including design and
21 construction of the facility, under this section—
22 (1) $35,000,000 for fiscal year 2018;
23 (2) $100,000,000 for fiscal year 2019;
24 (3) $200,000,000 for fiscal year 2020;
25 (4) $260,000,000 for fiscal year 2021;

1 (5) $340,000,000 for fiscal year 2022;

2 (6) $350,000,000 for fiscal year 2023;

3 (7) $350,000,000 for fiscal year 2024; and

4 (8) $350,000,000 for fiscal year 2025.

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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To provide for a study on broadening participation in certain National Science Foundation research and education programs, to collect data on Federal research grants to science agencies, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mrs. COMSTOCK introduced the following bill; which was referred to the Committee on _____

A BILL

To provide for a study on broadening participation in certain National Science Foundation research and education programs, to collect data on Federal research grants to science agencies, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "STEM Research and Education Effectiveness and Transparency Act".

1 **SEC. 2. BROADENING PARTICIPATION IN STEM PROGRAM**
2 **EFFECTIVENESS STUDY.**

3 (a) IN GENERAL.—Not later than 12 months after
4 the date of enactment of this Act, the Director of the Na-
5 tional Science Foundation shall submit a report to Con-
6 gress on the effectiveness of all National Science Founda-
7 tion research and education programs for broadening the
8 participation of women and other historically underrep-
9 resented individuals in STEM studies and careers, includ-
10 ing—

11 (1) development or identification of perform-
12 ance metrics to evaluate such programs;

13 (2) information on student outcomes using all
14 available data, including dropout rates, enrollment in
15 graduate programs, internships or apprenticeships,
16 and employment;

17 (3) identification of any data gaps for evalu-
18 ating the effectiveness and outcomes of National
19 Science Foundation programs to broaden participa-
20 tion; and

21 (4) recommendations for maintaining, trans-
22 lating, and disseminating outcomes data for STEM
23 programs funded by the National Science Founda-
24 tion.

25 (c) DEFINITION OF STEM.—In this section, the term
26 "STEM" has the meaning given the term in section 2 of

1 the America COMPETES Reauthorization Act of 2010
2 (42 U.S.C. 6621 note).

3 **SEC. 3. COLLECTION AND REPORTING OF DATA ON FED-**
4 **ERAL RESEARCH GRANTS.**

5 (a) COLLECTION OF DATA.—

6 (1) IN GENERAL.—Each Federal science agency
7 shall collect standardized record-level annual infor-
8 mation on demographics, primary field, award type,
9 review rating, budget request, funding outcome, and
10 awarded budget for all applications for merit-re-
11 viewed research and development grants to institu-
12 tions of higher education and Federal laboratories
13 supported by that agency.

14 (2) UNIFORMITY AND STANDARDIZATION.—The
15 Director shall establish a policy to ensure uniformity
16 and standardization of the data collection required
17 under paragraph (1).

18 (3) RECORD-LEVEL DATA.—

19 (A) REQUIREMENT.—On an annual basis,
20 beginning with the deadline under subpara-
21 graph (C), each Federal science agency shall
22 submit to the Director of the National Science
23 Foundation record-level data collected under
24 paragraph (1) in the form required by such Di-
25 rector.

1 (B) PREVIOUS DATA.—As part of the first
2 submission under subparagraph (A), each Fed-
3 eral science agency, to the extent practicable,
4 shall submit comparable record-level data for
5 the 5 years preceding the deadline under sub-
6 paragraph (C).
7 (C) DEADLINE.—The deadline under this
8 paragraph is not later than 1 year after the
9 date of enactment of this Act.
10 (b) REPORTING OF DATA.—The Director of the Na-
11 tional Science Foundation shall publish statistical sum-
12 mary data collected under this section, disaggregated and
13 cross-tabulated demographically and by years since com-
14 pletion of doctoral degree, including in conjunction with
15 the National Science Foundation's report required by sec-
16 tion 37 of the Science and Technology Equal Opportuni-
17 ties Act (42 U.S.C. 1885d; Public Law 96–516).
18 (c) DEFINITIONS.—In this section:
19 (1) DIRECTOR.—The term "Director" means
20 the Director of the Office of Science and Technology
21 Policy.
22 (2) FEDERAL LABORATORY.—The term "Fed-
23 eral laboratory" has the meaning given that term in
24 section 4 of the Stevenson-Wydler Technology Inno-
25 vation Act of 1980 (15 U.S.C. 3703).

1 (3) FEDERAL SCIENCE AGENCY.—The term
2 "Federal science agency" means any Federal agency
3 with at least $100,000,000 in research and develop-
4 ment expenditures in fiscal year 2017.
5 (4) INSTITUTION OF HIGHER EDUCATION.—The
6 term "institution of higher education" has the
7 meaning given such term in section 101(a) of the
8 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. 4323

To promote veteran involvement in STEM education, computer science, and scientific research, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. DUNN (for himself and Mr. TAKANO) introduced the following bill; which was referred to the Committee on _____

A BILL

To promote veteran involvement in STEM education, computer science, and scientific research, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Supporting Veterans in STEM Careers Act".

SEC. 2. DEFINITIONS.

In this Act:

1 (1) DIRECTOR.—The term "Director" means
2 the Director of the National Science Foundation.
3 (2) FOUNDATION.—The term "Foundation"
4 means the National Science Foundation.
5 (3) STEM.—The term "STEM" has the mean-
6 ing given the term in section 2 of the America COM-
7 PETES Reauthorization Act of 2010 (42 U.S.C.
8 6621 note).
9 (4) VETERAN.—The term "veteran" has the
10 meaning given the term in section 101 of title 38,
11 United States Code.

12 **SEC. 3. SUPPORTING VETERANS IN STEM EDUCATION AND**
13 **COMPUTER SCIENCE.**

14 (a) SUPPORTING VETERAN INVOLVEMENT IN SCI-
15 ENTIFIC RESEARCH AND STEM EDUCATION.—The Di-
16 rector shall, through the research and education activities
17 of the Foundation, encourage veterans to study and pur-
18 sue careers in STEM and computer science, in coordina-
19 tion with other Federal agencies that serve veterans.
20 (b) VETERAN OUTREACH PLAN.—Not later than 90
21 days after the date of enactment of this Act, the Director
22 shall submit to the Committee on Science, Space, and
23 Technology of the House of Representatives and the Com-
24 mittee on Commerce, Science, and Transportation of the

1 Senate a plan for how the Foundation can enhance its out-
2 reach efforts to veterans. Such plan shall—
3 (1) report on the Foundation's existing out-
4 reach activities;
5 (2) identify the best method for the Foundation
6 to leverage existing authorities and programs to fa-
7 cilitate and support veterans in STEM careers and
8 studies, including teaching programs; and
9 (3) identify a method for the Foundation to
10 track veteran participation in research and edu-
11 cation programs of the Foundation, and describe
12 any barriers to collecting such information.
13 (c) NATIONAL SCIENCE BOARD INDICATORS RE-
14 PORT.—The National Science Board shall provide in its
15 annual report on indicators of the state of science and en-
16 gineering in the United States any available and relevant
17 data on veterans in science and engineering careers or
18 education programs.
19 (d) ROBERT NOYCE TEACHER SCHOLARSHIP PRO-
20 GRAM UPDATE.—Section 10 of the National Science
21 Foundation Authorization Act of 2002 (42 U.S.C. 1862n–
22 1) is amended—
23 (1) in subsection (a)(5)—
24 (A) in subparagraph (A), by striking
25 "and" at the end;

1 (B) in subparagraph (B), by striking the
2 period and inserting "; and"; and
3 (C) by adding at the end the following:
4 "(C) higher education programs that serve
5 or support veterans.";
6 (2) in subsection (b)(2)(F)—
7 (A) by striking "and students" and insert-
8 ing ", students"; and
9 (B) by inserting ", and veterans" before
10 the period at the end;
11 (3) in subsection (c)(2), by inserting "and vet-
12 erans" before the period at the end; and
13 (4) in subsection (d)(2), by inserting "and vet-
14 erans" before the period at the end.
15 (e) NATIONAL SCIENCE FOUNDATION TEACHING
16 FELLOWSHIPS AND MASTER TEACHING FELLOWSHIPS
17 UPDATE.—Section 10A(d) of the National Science Foun-
18 dation Authorization Act of 2002 (42 U.S.C. 1862n–
19 1a(d)) is amended—
20 (1) in paragraph (3)(F)—
21 (A) by striking "and individuals" and in-
22 serting ", individuals"; and
23 (B) by inserting ", and veterans" before
24 the period at the end; and

1 (2) in paragraph (4)(B), by inserting "and vet-
2 erans" before the period at the end.
3 (f) NATIONAL SCIENCE FOUNDATION COMPUTER
4 AND NETWORK SECURITY CAPACITY BUILDING GRANTS
5 UPDATE.—Section 5(a) of the Cyber Security Research
6 and Development Act of 2002 (15 U.S.C. 7404(a)) is
7 amended—
8 (1) in paragraph (1), by inserting "and stu-
9 dents who are veterans" after "these fields"; and
10 (2) in paragraph (3)—
11 (A) in subparagraph (I), by striking "and"
12 at the end;
13 (B) by redesignating subparagraph (J) as
14 subparagraph (K); and
15 (C) by inserting after subparagraph (I) the
16 following:
17 "(J) creating opportunities for veterans to
18 transition to careers in computer and network
19 security; and".
20 (g) GRADUATE TRAINEESHIPS IN COMPUTER AND
21 NETWORK SECURITY RESEARCH UPDATE.—Section
22 5(c)(6)(C) of the Cyber Security Research and Develop-
23 ment Act of 2002 (15 U.S.C. 7404(c)(6)(C)) is amended
24 by inserting "or veterans," after "disciplines".

1 (h) VETERANS AND MILITARY FAMILIES STEM
2 EDUCATION INTERAGENCY SUBCOMMITTEE.—
3 (1) IN GENERAL.—The Director of the Office of
4 Science and Technology Policy shall establish a sub-
5 committee under the Committee on STEM Edu-
6 cation of the National Science and Technology
7 Council (established under section 101 of the Amer-
8 ica COMPETES Reauthorization Act of 2010) to
9 coordinate Federal programs and policies for
10 transitioning and training veterans and military
11 spouses for STEM careers.
12 (2) DUTIES OF SUBCOMMITTEE.—The sub-
13 committee established under paragraph (1) shall—
14 (A) coordinate Federal agency STEM out-
15 reach activities and programs for veterans and
16 military spouses; and
17 (B) develop and facilitate the implementa-
18 tion by participating agencies of a strategic
19 plan, which shall—
20 (i) specify and prioritize short- and
21 long-term objectives;
22 (ii) specify the common metrics that
23 will be used by Federal agencies to assess
24 progress toward achieving such objectives;

1 (iii) identify barriers veterans face in
2 reentering the workforce, including a lack
3 of formal STEM education, career guid-
4 ance, and the process of transferring mili-
5 tary credits and skills to college credits;
6 (iv) identify barriers military spouses
7 face in establishing careers in STEM
8 fields;
9 (v) describe the approaches that each
10 participating agency will take to address
11 administratively the barriers described in
12 clauses (iii) and (iv); and
13 (vi) identify any barriers that require
14 Federal or State legislative or regulatory
15 changes in order to be addressed.
16 (3) DUTIES OF OSTP.—The Director of the Of-
17 fice of Science and Technology Policy shall encour-
18 age and monitor the efforts of the Federal agencies
19 participating in the subcommittee to ensure that the
20 strategic plan required under paragraph (2)(B) is
21 developed and executed effectively and that the ob-
22 jectives of such strategic plan are met.
23 (4) REPORT.—The Director of the Office of
24 Science and Technology Policy shall—

1 (A) not later than 1 year after the date of
2 enactment of this Act, submit to Congress the
3 strategic plan required under paragraph (2)(B);
4 and
5 (B) include in the annual report required
6 by section 101(d) of the America COMPETES
7 Reauthorization Act a description of any
8 progress made in carrying out the activities de-
9 scribed in paragraph (2)(B) of this subsection.

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115TH CONGRESS
1ST SESSION

H. R. 4254

To amend the National Science Foundation Authorization Act of 2002 to strengthen the aerospace workforce pipeline by the promotion of Robert Noyce Teacher Scholarship Program and National Aeronautics and Space Administration internship and fellowship opportunities to women, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 6, 2017

Mr. KNIGHT (for himself, Ms. ESTY of Connecticut, Ms. KAPTUR, and Mrs. COMSTOCK) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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A BILL

To amend the National Science Foundation Authorization Act of 2002 to strengthen the aerospace workforce pipeline by the promotion of Robert Noyce Teacher Scholarship Program and National Aeronautics and Space Administration internship and fellowship opportunities to women, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "Women in Aerospace
5 Education Act".

SEC. 2. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM FELLOWSHIP OPPORTUNITIES.

(a) IN GENERAL.—Section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1) is amended by adding at the end the following:

"(m) FELLOWSHIP PLACEMENTS IN NATIONAL LABORATORIES AND NASA CENTERS.—The Director of the National Science Foundation shall encourage eligible entities administering a fellowship program using funds awarded under this section to include in such program opportunities for the placement of fellows in research or education internship opportunities at national laboratories and NASA centers. The Director may give priority to proposals for such placements that provide female fellows with research experience in aerospace engineering and related fields in which women are underrepresented.".

(b) EFFECTIVE DATE.—The amendment made by subsection (a) shall apply with respect to grants awarded on or after October 1, 2018.

SEC. 3. NASA INTERNSHIP AND FELLOWSHIP OPPORTUNITIES.

Not later than October 1, 2018, the Administrator of the National Aeronautics and Space Administration (in this section referred to as "NASA") shall institute a process to prioritize the promotion and recruitment of qualified candidates who are women or individuals who are histori-

1 cally underrepresented in the fields of science, technology,
2 engineering, and mathematics (STEM) and computer
3 science for internships and fellowships at NASA with rel-
4 evance to the aerospace sector and related fields.

○

AMENDMENT TO H.R. 4254

OFFERED BY MR. KNIGHT OF CALIFORNIA

Page 2, line 3, amend subsection (a) to read as follows:

1 (a) IN GENERAL.—The National Science Foundation
2 Authorization Act of 2002 (Public Law 107–368; 42
3 U.S.C. 1862n et seq.) is amended—
4 (1) in section 10(a)(3)(A)(iv), by inserting ",
5 including research experiences at national labora-
6 tories and NASA centers" before the semicolon; and
7 (2) in section 10A(c)(4)—
8 (A) in subparagraph (A), by striking
9 "and" at the end;
10 (B) in subparagraph (B), by striking the
11 period at the end and inserting "; and"; and
12 (C) by adding at the end the following:
13 "(C) providing internship opportunities for
14 fellows, including research experiences at na-
15 tional laboratories and NASA Centers.".

Page 2, line 17, strike "amendment" and insert "amendments".

Page 2, line 25, strike "promotion and".

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115TH CONGRESS
1ST SESSION

H. R. 3397

To direct the National Science Foundation to support STEM education research focused on early childhood.

IN THE HOUSE OF REPRESENTATIVES

JULY 25, 2017

Ms. ROSEN (for herself, Mr. KNIGHT, Mr. EVANS, Mr. MEEKS, Mr. TONKO, Ms. HANABUSA, Mr. BEYER, Ms. ESTY of Connecticut, Mr. CRIST, Ms. SLAUGHTER, and Mr. SOTO) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

---

A BILL

To direct the National Science Foundation to support STEM education research focused on early childhood.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Building Blocks of STEM Act".

SEC. 2. FINDINGS.

The Congress finds the following:

(1) The National Science Foundation has made the largest financial investment in STEM education

of all Federal agencies, and plays a very powerful role in helping to set research and policy agendas.

(2) Studies have found that children who engage in scientific activities from an early age develop positive attitudes toward science and are more likely to pursue STEM expertise and careers later on.

(3) However, the majority of current research focuses on increasing STEM opportunities for students in middle school and older.

(4) Women remain widely underrepresented in the STEM workforce and this gender disparity extends down through all levels of education. Strategic funding of programs is needed in order to understand and address the root cause of this gap.

SEC. 3. DEFINITIONS.

In this Act:

(1) EARLY CHILDHOOD.—The term "early childhood" applies to children from birth through the age of 10.

(2) STEM.—The terms "STEM" means science, technology, engineering, and mathematics, including computer science.

1 **SEC. 4. SUPPORTING STEM RESEARCH ON EARLY CHILD-**
2 **HOOD.**

3 In awarding grants under the Discovery Research
4 PreK–12 program, the Director of the National Science
5 Foundation shall consider age distribution in order to
6 more equitably allocate funding for research studies with
7 a focus on early childhood.

○

AMENDMENT TO H.R. 3397

OFFERED BY MRS. COMSTOCK OF VIRGINIA

Strike all after the enacting clause and insert the following:

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the "Building Blocks of
3 STEM Act".

4 **SEC. 2. FINDINGS.**

5 The Congress finds the following:

6 (1) The National Science Foundation has made
7 the largest financial investment in STEM education
8 of all Federal agencies, and plays a very powerful
9 role in helping to set research and policy agendas.

10 (2) Studies have found that children who en-
11 gage in scientific activities from an early age develop
12 positive attitudes toward science and are more likely
13 to pursue STEM expertise and careers later on.

14 (3) However, the majority of current research
15 focuses on increasing STEM opportunities for stu-
16 dents in middle school and older.

17 (4) Women remain widely underrepresented in
18 the STEM workforce and this gender disparity ex-
19 tends down through all levels of education. Strategic

1 funding of programs is needed in order to under-
2 stand and address the root cause of this gap.

3 **SEC. 3. DEFINITIONS.**

4 In this Act:

5 (1) DIRECTOR.—The term "Director" means
6 the Director of the National Science Foundation.

7 (2) EARLY CHILDHOOD.—The term "early
8 childhood" applies to children from birth through
9 the age of 10.

10 (3) INSTITUTION OF HIGHER EDUCATION.—The
11 term "institution of higher education" has the
12 meaning given the term in section 101(a) of the
13 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

14 (4) LOCAL EDUCATIONAL AGENCY.—The term
15 "local educational agency" has the meaning given
16 the term in section 8101 of the Elementary and Sec-
17 ondary Education Act of 1965 (20 USC 7801), ex-
18 cept that such term also includes preschools, after-
19 school programs, and summer programs.

20 (5) STEM.—The term "STEM" has the mean-
21 ing given the term in section 2 of the America COM-
22 PETES Reauthorization Act of 2010 (42 U.S.C.
23 6621 note).

1 (6) YOUNG GIRLS.—The term "young girls"
2 means female individuals who have not attained the
3 age of 11.

4 **SEC. 4. SUPPORTING STEM RESEARCH ON EARLY CHILD-**
5 **HOOD.**

6 In awarding grants under the Discovery Research
7 PreK–12 program, the Director shall consider age dis-
8 tribution in order to more equitably allocate funding for
9 research studies with a focus on early childhood.

10 **SEC. 5. SUPPORTING GIRLS IN STEM EDUCATION AND COM-**
11 **PUTER SCIENCE.**

12 (a) RESEARCH GRANTS.—
13 (1) IN GENERAL.—The Director shall award
14 grants, on a competitive basis, to institutions of
15 higher education or nonprofit organizations (or con-
16 sortia of such institutions or organizations), to accel-
17 erate research efforts to increase understanding of
18 the factors that contribute to the participation of
19 young girls in STEM activities.
20 (2) RESEARCH AREAS.—Research areas funded
21 by a grant under this subsection may include—
22 (A) the role of teacher training and profes-
23 sional development, including effective incentive
24 structures to encourage teachers to participate
25 in such training and professional development,

1 in encouraging or discouraging young girls from
2 participating in STEM activities;
3 (B) the role of teachers in shaping young
4 girls' perceptions of STEM and discouraging
5 such girls from participating in STEM activi-
6 ties;
7 (C) the role of other facets of the learning
8 environment on the willingness of young girls to
9 participate in STEM activities, including learn-
10 ing materials and textbooks, classroom decora-
11 tions, seating arrangements, use of media and
12 technology, classroom culture, and gender com-
13 position of students during group work;
14 (D) the role of parents and other care-
15 givers in encouraging or discouraging young
16 girls from participating in STEM activities;
17 (E) the types of STEM activities that elicit
18 greater participation by young girls;
19 (F) the role of mentorship and best prac-
20 tices in finding and utilizing mentors;
21 (G) the role of informal and out-of-school
22 STEM learning opportunities on girls' percep-
23 tion of and participation in STEM activities;
24 and

1 (H) any other activity the Director deter-
2 mines will accomplish the goals of this sub-
3 section.
4 (3) GRANT RECIPIENT REPORT.—An entity
5 awarded a grant under this subsection shall report
6 to the Director, at such time and in such manner as
7 the Director may require, on the activities carried
8 out and materials developed using such grant funds.
9 (b) DEVELOPMENT AND TESTING OF SCALABLE
10 MODELS FOR INCREASED ENGAGEMENT.—
11 (1) IN GENERAL.—The Director shall award
12 grants, on a competitive basis, to institutions of
13 higher education or nonprofit organizations (or con-
14 sortia of such institutions or organizations), to de-
15 velop and evaluate interventions in pre-K and ele-
16 mentary school classrooms that increase participa-
17 tion of young girls in computer science activities.
18 (2) PARTNERSHIPS.—In order to be eligible to
19 receive a grant under this subsection, an institute of
20 higher education, nonprofit organization, or consor-
21 tium, shall enter into a partnership with one or more
22 local educational agency or State in carrying out the
23 activities funded by such grant.
24 (3) USES OF FUNDS.—Grants awarded under
25 this subsection shall be used for activities that draw

1 upon the expertise of the partner entities described
2 in paragraph (2) to increase participation of young
3 girls in computer science activities, including—
4 (A) offering training and professional de-
5 velopment programs, including summer or aca-
6 demic year institutes or workshops, designed to
7 strengthen the capabilities of pre-K and elemen-
8 tary school teachers and to familiarize such
9 teachers with the role of gender bias in the
10 classroom;
11 (B) offering innovative preservice and in-
12 service programs that instruct teachers on gen-
13 der-inclusive practices for teaching computing
14 concepts;
15 (C) developing distance learning programs
16 for teachers or students, including developing
17 curricular materials, play-based computing ac-
18 tivities, and other resources for the in-service
19 professional development of teachers that are
20 made available to teachers through the Inter-
21 net;
22 (D) developing a cadre of master teachers
23 who will promote reform and the adoption of
24 gender-inclusive practices in teaching computer
25 science concepts in early childhood education;

1 (E) developing tools to evaluate activities
2 conducted under this subsection;
3 (F) developing or adapting pre-K and ele-
4 mentary school computer science curricular ma-
5 terials that incorporate contemporary research
6 on the science of learning, particularly with re-
7 spect to gender inclusion;
8 (G) developing and offering gender-inclu-
9 sive computer science enrichment programs for
10 students, including after-school and summer
11 programs;
12 (H) providing mentors for girls in person
13 and through the Internet to support such girls
14 in participating in computer science activities;
15 (I) engaging parents of girls about the dif-
16 ficulties faced by girls to maintain an interest
17 and desire to participate in computer science
18 activities, and enlisting the help of parents in
19 overcoming these difficulties;
20 (J) acquainting girls with careers in com-
21 puter science and encouraging girls to consider
22 careers in such field; and
23 (K) any other activities the Director deter-
24 mines will accomplish the goals of this sub-
25 section.

1 (4) GRANT RECIPIENT REPORT.—An entity
2 awarded a grant under this subsection shall report
3 to the Director, at such time and in such manner as
4 the Director may require, on the activities carried
5 out, materials developed using such grant funds, and
6 the outcomes for students served by such grant.
7 (5) EVALUATION REQUIRED.—Not later than 4
8 years after the date of enactment of this Act, the
9 Director shall evaluate the grant program under this
10 subsection. At a minimum, such evaluation shall—
11 (A) use a common set of benchmarks and
12 assessment tools to identify best practices and
13 materials developed and demonstrated by the
14 partnerships described in paragraph (2); and
15 (B) to the extent practicable, compare the
16 effectiveness of practices and materials devel-
17 oped and demonstrated by such partnerships
18 with those of partnerships funded by other local
19 or State government or Federal Government
20 programs.
21 (6) DISSEMINATION OF RESULTS.—
22 (A) EVALUATION RESULTS.—The Director
23 shall make publicly available free of charge on
24 an Internet website and shall submit to Con-

1 gress the results of the evaluation required
2 under paragraph (5).
3 (B) MATERIALS.—The Director shall en-
4 sure that materials developed under a program
5 funded by a grant under this subsection, that
6 are demonstrated to be effective in achieving
7 the goals of this subsection (as determined by
8 the Director), are made publicly available free
9 of charge on an Internet website, including
10 through an arrangement with an outside entity.
11 (7) ANNUAL MEETING.—The Director may con-
12 vene an annual meeting of the partnerships partici-
13 pating in a program funded by a grant under this
14 subsection, for the purpose of fostering greater na-
15 tional collaboration.
16 (8) TECHNICAL ASSISTANCE.—At the request of
17 a partnership seeking a grant under this subsection,
18 the Director shall provide the partnership with tech-
19 nical assistance in meeting any requirement of this
20 subsection.

21 **SEC. 6. COMPUTER SCIENCE IN THE ROBERT NOYCE**
22 **TEACHER SCHOLARSHIP PROGRAM.**

23 Section 10 of the National Science Foundation Au-
24 thorization Act of 2002 (42 U.S.C. 1862n–1) is amend-
25 ed—

1 (1) by striking "and mathematics" each place it
2 appears and inserting "mathematics, informatics,
3 and computer science";
4 (2) in subsection (a)(3)(B), by striking "or
5 mathematics" and inserting "mathematics,
6 informatics, and computer science";
7 (3) in subsections (b)(1)(D)(i), (c)(1)(A),
8 (d)(1), and (i)(7), by striking "or mathematics"
9 each place it appears and inserting "mathematics,
10 informatics, or computer science"; and
11 (4) in subsection (i)(5), by striking "or mathe-
12 matics" and inserting "mathematics, or computer
13 science".

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PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 4675, LOW-DOSE RADIATION RESEARCH ACT OF 2017

WEDNESDAY, JANUARY 10, 2018

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:04 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order. Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee rule 2(e) and House rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today, we meet to consider H.R. 4675, the *Low Dose Radiation Research Act of 2017*. Pursuant to notice, I now call up H.R. 4675, the *Low Dose Radiation Research Act of 2017*, and the clerk will report the bill.

The CLERK. H.R. 4675, a bill to amend the *Energy Policy Act of 2005* to provide for a Low Dose Radiation Basic Research Program.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And I'll recognize myself for an opening statement.

H.R. 4675, the *Low Dose Radiation Research Act of 2017* is bipartisan legislation, and was introduced by Representatives Roger Marshall, Dan Lipinski, Randy Weber, and myself. It authorizes a revitalized Low Dose Radiation Research Program within the Biological and Environmental Research Division of Department of Energy's Office of Science. This research program is part of the Science Committee's continued effort to ensure America remains a leader in basic research and innovation.

H.R. 4675 directs DOE to identify ongoing challenges in low dose radiation science and develop a long-term basic research plan that addresses these challenges. It also directs the Department to engage with other Federal agencies and the international research community to develop the basic research program. This program will analyze any unknown health impacts of low levels of radiation, providing critical knowledge to our Nation's researchers, industry, healthcare community and military as they handle nuclear material, maintain the Nation's nuclear weapons program, provide medical treatment, and dispose of nuclear waste.

Low dose radiation research can also inform regulatory agencies that set nuclear safety standards for the public, including enabling Federal emergency response agencies to more accurately set areas of evacuation for a radiological incident like a nuclear power plant meltdown.

This research is also of particular importance to practicing physicians, who rely on thorough knowledge of radiation health risk to decide when and how to use lifesaving diagnostics to detect and treat cancer in patients.

In the last Congress, this Committee explored DOE's ill-advised decision to terminate its Low Dose Radiation Research Program, which, until its closure in 2016, was one of the largest and most effective programs of its kind in the world. With so many questions left unanswered about the science of low dose radiation, it is no surprise that closure of this crucial basic research program was opposed by the scientific community.

In a hearing last fall, the Science Committee heard from witnesses who strongly supported reprioritizing low dose radiation research at DOE. This legislation has received letters of support from the Health Physics Society, the American Association of Physicists in Medicine, the National Council on Radiation Protection and Measurements, and leading researchers from Northwestern University and Columbia University. Congress must reprioritize basic research in low dose radiation so we know we are using the best available science to serve and maximize our Nation's energy, medical, and defense needs.

Again, I thank the bill's primary sponsors, Representative Marshall, Ranking Member Lipinski, and Chairman Weber, for their initiative on this issue, and I urge my colleagues on the Committee to support this legislation.

PREPARED STATEMENT OF CHAIRMAN SMITH

Today we will consider an important Energy Subcommittee bill, H.R. 4675, the *Low Dose Radiation Research Act of 2017*.

This bipartisan legislation was introduced by Representatives Roger Marshall, Dan Lipinksi, Randy Weber and myself. It authorizes a revitalized low-dose radiation research program within the Biological and Environmental Research division of Department of Energy (DOE) Office of Science.

This research program is part of the Science Committee's continued effort to ensure America remains a leader in basic research and innovation.

H.R. 4675 directs DOE to identify ongoing challenges in low-dose radiation science and develop a long-term basic research plan that addresses these challenges.

It also directs the department to engage with other federal agencies and the international research community to develop the basic research program.

This program will analyze any unknown health impacts of low levels of radiation, providing critical knowledge to our nation's researchers, industry, health care community and military as they handle nuclear material, maintain the nation's nuclear weapons program, provide medical treatment and dispose of nuclear waste.

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Congress must re-prioritize basic research in low dose radiation so we know we are using the best available science to serve and maximize our nation's energy, medical and defense needs.

Again, I thank this bill's sponsors, Rep. Marshall, Ranking Member Lipinski and Chairman Weber, for their initiative on this issue and I urge my colleagues on the committee to support this bipartisan bill.

Chairman SMITH. The gentlewoman from Texas, Eddie Bernice Johnson, the Ranking Member, is recognized for her opening statement.

Ms. JOHNSON. Thank you very much, Chairman Smith, for holding today's markup of H.R. 4675, the *Low Dose Radiation Research Program Act of 2017*. This research is important to better understand the health impacts of exposure to low dosages of radiation that could result from medical tests, terrorism events, or materials associated with nuclear weapons in power production.

Since its inception in 1998, the Low Dose Radiation Research Program at the Department of Energy had provided high-value scientific data to help determine these risks. However, its funding levels have been cut since 2012 as Obama Administration informally expressed its intention to end the program. And it was finally terminated last year. And thus far, the Trump Administration has not indicated any interest in restoring DOE's stewardship of these activities.

In November, GAO provided testimony before this Committee is a recent report—on a recent report which recommended that DOE lead the development of a plan for interagency collaboration on research into low dose radiation's health effects, citing a lack of coordination efforts among Federal agencies as the Department began phasing out this program.

I believe that this bipartisan bill reflects GAO's findings and recommendations, and I have sponsored and supported similar legislative language in the past congresses. Therefore, I am pleased to support H.R. 4675 as well and look forward to working with my colleagues on both sides of the aisle, as well as the Administration, to restore the U.S. scientific leadership in this critical area.

Thanks, and yield back the balance of my time.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith, for holding today's markup of H.R. 4675, the *Low-Dose Radiation Research Program Act of 2017*.

This research is important to better understanding the health impacts of exposure to low doses of radiation that could result from medical tests, terrorism events, or materials associated with nuclear weapons and power production.

Since its inception in 1998, the Low Dose Radiation Research Program at the Department of Energy had provided high-value scientific data to help determine these risks.

However, its funding levels have been cut since 2012, as the Obama administration informally expressed its intention to end the program, and it was finally terminated last year. And thus far the Trump Administration also has not indicated any interest in restoring DOE's stewardship of these activities.

In November, GAO provided testimony before this Committee on a recent report which recommended that DOE lead the development of a plan for interagency collaboration on research into low dose radiation's health effects, citing a lack of coordination efforts among federal agencies after the Department began phasing out its program.

I believe that this bipartisan bill reflects GAO's findings and recommendations, and I have sponsored and supported similar legislative language in the past few Congresses.

Therefore I am pleased to support H.R. 4675 as well, as look forward to working with my colleagues on both sides of the aisle as well as the Administration to restore U.S. scientific leadership in this critical area. Thank you Chairman Smith, and I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

And the bill's sponsor, the gentleman from Kansas, Dr. Marshall is recognized for his opening statement.

Mr. MARSHALL. Good morning, and thank you, Chairman Smith, for the opportunity to speak on behalf of this important legislation. I would also like to thank the Chairman, as well as Representatives Dan Lipinski and Randy Weber, for cosponsoring H.R. 4675, the *Low Dose Radiation Research Act of 2017*. I'm grateful for their leadership and their commitment to biological and environmental science research and truly blessed to work alongside the Members of this Committee that have supported initiatives in basic science research to keep America safe and globally competitive.

The *Low Dose Radiation Research Act of 2017* requires the Department of Energy to carry out a research program on low dose radiation within the Office of Science. The bill directs the Department of Energy to work with key Federal agencies and research communities to develop a long-term strategic research plan. This program will increase our understanding of the health effects that low doses of ionizing radiation have on biological systems.

Every day, humans are exposed to low doses of radiation. It is the product of industrial activities, commercial processes, medical procedures, and naturally occurring systems. Research has consistently shown us the adverse health effects associated with high doses of radiation, but the health risk associated with exposure to low doses of radiation are much more difficult to observe, and we are a long way from understanding and accurately assessing those risks.

In the absence of conclusive evidence, agencies like the Department of Energy, the Food and Drug Administration, and the Environmental Protection Agency are obligated to assume that any exposure to radiation increases the risk of harmful health effects. Without proper research, agencies have no way to measure if there is a safe radiation threshold.

Our restricted understanding of low dose radiation health risks directly impacts our ability to address potential radiological effects and medically based radiation exposures. It may also result in overly stringent regulatory standards, inhibiting the development of nuclear energy opportunities and imposing an undue economic burden on the American people.

As a physician in my home State of Kansas, I've had a firsthand understanding of the crucial importance of verified research in ensuring the best medical outcomes for my patients. For instance, an adult patient who receives a computed tomography or CT scan of the torso is exposed to approximately 3 years' worth of background

radiation at once. The CT scan is an invaluable diagnostic, replacing many invasive surgical procedures and is a medical necessity for countless Americans. Today, we physicians are unable to inform our patients of the specific health risk with these type of vital imaging processes.

There is a broad consensus among the radiobiology community that more research is necessary for Federal agencies, physicians, and related experts to make better informed decisions regarding these risks. It is no surprise that H.R. 4675 has received support from the Health Physics Society, the American Association of Physicists in Medicine, the National Council on Protection and Measurements, and leading researchers from Northwestern University and Columbia University.

Once again, I'd like to thank Representative Dan Lipinski, Chairman Lamar Smith, and Energy Subcommittee Chairman Randy Weber for cosponsoring this important legislation. I encourage my colleagues to support this bill, and I yield back the balance of my time.

PREPARED STATEMENT OF MR. MARSHALL

Good morning. Thank you, Chairman Smith, for the opportunity to speak on behalf of this important legislation. I would like to thank the chairman, as well as Representatives Dan Lipinski and Randy Weber, for cosponsoring H.R. 4675, the *Low Dose Radiation Research Act of 2017*. I am grateful for their leadership and their commitment to biological and environmental science research. And truly blessed to work alongside the members of this committee that have supported initiatives in basic science research to keep America safe and globally competitive. The *Low Dose Radiation Research Act of 2017* requires the Department of Energy to carry out a research program on low dose radiation within the Office of Science.

This bill directs the Department of Energy to work with key federal agencies and research communities to develop a long-term strategic research plan. This program will increase our understanding of the health effects that low doses of ionizing radiation have on biological systems. Every day, humans are exposed to low doses of radiation. It is the product of industrial activities, commercial processes, medical procedures and naturally occurring systems. Research has consistently shown us the adverse health effects associated with high doses of radiation. But the health risks associated with exposure to low doses of radiation are much more difficult to observe, and we are a long way away from understanding and accurately assessing this risk.

In the absence of conclusive evidence, agencies like the Department of Energy, the Food and Drug Administration and the Environmental Protection Agency are obligated to assume that any exposure to radiation increases the risk of harmful health effects. Without proper research, agencies have no way to measure if there is a safe radiation threshold. Our restricted understanding of low-dose radiation health risks directly impairs our ability to address potential radiological events and medicallybased radiation exposures. It may also result in overly stringent regulatory standards, inhibiting the development of nuclear energy opportunities and posing an undue economic burden on the American people.

As a physician in my home state of Kansas, I have a first-hand understanding of the crucial importance of verified research in ensuring the best medical outcomes for my patients. For instance, an adult patient who receives a computed tomography (or CT) scan of the torso, is exposed to approximately three years' worth of background radiation at once. The CT scan is an invaluable diagnostic tool, replacing many invasive surgical procedures, and is a medical necessity for countless Americans. Today, we physicians are unable to inform our patients of the specific health risks associated with these types of vital imaging processes.

There is broad consensus among the radiobiology community that more research is necessary for federal agencies, physicians and related experts to make betterinformed decisions regarding these risks. It is no surprise that H.R. 4675 has received support from the Health Physics Society, the American Association of Physicists in Medicine, the National Council on Radiation Protection and Measurements and leading researchers from Northwestern University and Columbia University.

Once again, I would like to thank Representative Dan Lipinski, Chairman Lamar Smith and Energy Subcommittee Chairman Randy Weber for cosponsoring this important legislation.

I encourage my colleagues to support this bill, and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Marshall.

And the gentleman from Illinois, the Ranking Member of the Research and Technology Subcommittee and the other lead sponsor of this legislation, is recognized.

Mr. LIPINSKI. Thank you, Mr. Chairman. I want to thank you, and I want to concur with your comments and Ranking Member Johnson's comments. And I want to thank Mr. Marshall for introducing this bill, and I'm pleased to join him as the lead Democratic cosponsor of this bill.

Low dose radiation research is a critical field that can provide important insights into the biological response of cells to low levels of ionizing radiation. This research has obvious potential impacts in the field of diagnostic medicine but will also provide crucial information for nuclear energy industry, environmental cleanup operations, and our national security.

Almost 20 years ago, the Department of Energy began funding research into low dose radiation. During the program's history, DOE's research has resulted in a number of important advancements in our understanding of cellular response to radiation exposure. However, during the Obama Administration, officials at the Department of Energy decided that this work was no longer a priority and proposed to ramp down funding and eventually eliminate this work.

Appropriators followed this recommendation, and without a statutory authorization in place, the Low Dose Radiation Research Program was eliminated. The current Administration did not propose new funding for this research in Fiscal Year 2018 in their budget request, and we do not expect anything different in the budget proposal we will see for 2019.

The process by which the Low Dose Radiation Research Program was eliminated underscores the importance of this bill. As an authorizing Committee, it is crucial that we hear from the experts, consider the body of evidence, and determine the priorities of the agencies that are under our jurisdiction. That is our job.

In the last several years, a variety of stakeholders, as well as the Government Accountability Office, have weighed in on the need for this research. And our Committee has heard the same in two hearings on this topic in the last 2 years. That's why I'm happy to serve as the lead Democratic cosponsor of this small but very important research bill.

I'm hopeful that during the next several months we can follow the model we followed on this bill and pass other well-vetted bipartisan bills out of this Committee. I encourage my colleagues to support the bill and such continued efforts. And thank you, Mr. Chairman, and I yield back.

Chairman SMITH. Thank you, Mr. Lipinski.

And the gentleman from Florida, Mr. Dunn, is recognized.

Mr. DUNN. Thank you very much, Mr. Chairman, and Ranking Member Johnson. I want to thank all of you for convening this

meeting to take into consideration H.R. 4675, the *Low Dose Radiation Research Act of 2017*.

I also want to congratulate my classmate and my friend Dr. Marshall and his cosponsor Mr. Lipinski for investing the time to produce this bill.

During the Committee's hearing on the subject, Dr. Brink from the American College of Radiology testified that more than a million patients a year receive the benefits of radiation treatment, which include extended life and relief from pain and suffering. Improving our scientific understanding of the effects of exposure to low dose radiation will accelerate development of advanced diagnostic and therapeutic procedures and enhance the acceptance of controlled use of radiation among patients and doctors, which will improve the quality of care and save lives.

And this legislation like 4675 makes me optimistic for my children and my grandchildren's future and why I'm honored to serve on this Committee with all of you.

Thank you, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Dunn.

If there's no further discussion, we will go to amendments—and I'm aware of two—both to be offered by Mr. Foster, and he is recognized for the purpose of offering the first one.

Mr. FOSTER. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 4675 offered by Mr. Foster of Illinois, amendment number 74.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman from Illinois is recognized to explain his amendment.

Mr. FOSTER. Thank you. My amendments would simply direct the Secretary to identify and, to the extent possible, to quantify the potential benefits to stakeholders of the Low Dose Radiation Research Program and different components of it.

The research that comes out of this program will have a number of uses across several agencies and sectors, including the private sector and the public at large. For instance, if we learn that astronauts could be safely exposed to slightly higher levels of radiation, this could have potential cost-saving implications for manned spaceship design or the reverse is possible. To the extent that medical treatment and diagnosis represents a tradeoff between radiation and health benefits, then we can get to a more science-based position there.

Environmental remediation from radon in basements to the cleanup of legacy sites, legacy weapons sites to the safety of nuclear workers are other important examples where you have to make sure that the research you're doing matches the actual application in the real world. So an effort to quantify to the extent possible these potential benefits is essential to ensuring that the Low Dose Radiation Program properly prioritizes questions with the greatest real-world impact.

The funding that we all hope will become available for this program will not be infinite, and it's important that when the program is restarted, that it is restarted especially in the areas that will

really, you know, make the world a safer and less expensive place to live in.

So I'm pleased to see such strong bipartisan support and join with my colleagues in supporting the reinstatement of a Low Dose Research Radiation Program in DOE. I believe that my amendment will help insure not only the best use of DOE's limited resources but also the long-term success of the Low Dose Radiation Research Program.

I understand that the Chairman supports this amendment and will accept it, so I'd like to thank him and Ranking Member Johnson for their support and yield back the balance of my time.

Chairman SMITH. And thank you, Mr. Foster. You're correct. I'll recognize myself in support of the amendment.

The amendment would add a requirement that the Secretary of Energy identify potential monetary and health-related benefits that could occur through the results of the research program authorized in this legislation. So this is a commonsense amendment that seeks to show the value of continued investments in basic research like the Low Dose Radiation Research Program. I encourage Members to support the amendment.

Is there any further discussion on the amendment?

The Ranking Member Ms. Johnson is recognized.

Ms. JOHNSON. I'd like to move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. Thank you, Mr. Chairman.

I support this amendment and appreciate Dr. Foster's work to improve the legislation we're considering today.

As we heard during the Committee hearing that took place in November, research into low dose radiation can have far-reaching impacts in a variety of industries and disciplines. One of the key takeaways from that hearing is that the economic and health benefits from this research are likely numerous but unknown. I support this important addition to the program's scope directing the Department to consider the potential benefits to key stakeholders in government, academia, and private industry, would provide helpful guidance to the program and would ensure that the benefits of the research are well recognized. And I encourage my colleagues to join me in supporting the amendments, and I yield back.

Chairman SMITH. OK. Thank you, Ms. Johnson.

If there's no further discussion, the question is on agreeing to the amendment.

All in favor, say aye.

Opposed, no.

The amendment is agreed to. And the gentleman is recognized for purposes of offering the next amendment.

Mr. FOSTER. Thank you, Mr. Chairman. I have another amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 4675 offered by Mr. Foster of Illinois, amendment number 72.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman continues to be recognized.

Mr. FOSTER. Thank you, Chairman Smith.

A few months ago, we held a Subcommittee hearing on the Low Dose Radiation Research Program at the Department of Energy. It was a very productive and bipartisan discussion, although I remain disappointed that no one from the Department of Energy was there to participate.

I join with my Republican colleagues in supporting the reinstatement of the Low Dose Radiation Research Program at DOE. I appreciate that this bill acknowledges the need to formulate scientific goals for the low dose program and that it instructs the Secretary to consult with and engage with other Federal agencies. I believe this is key to ensuring the success of a renewed effort on low dose radiation.

And given the bipartisan support for this program, however, I was disappointed to see that the underlying bill expects the Department of Energy to start this new research program with no new funding. You know, it seems as though we used to have bipartisan agreement in Congress that when we ask the government to spend more money, that we would actually specify how to pay for it rather than pushing the debt onto our children, but it appears in recent times that that bipartisan agreement seems to have vanished.

So my amendment today simply corrects this by increasing the authorization for the BER program by the amount dictated in the underlying bill. It's irresponsible, I believe, to direct DOE to undertake new research—a new research program with no new funding, and that would inevitably mean that another valuable area of research within BER would suffer.

Now, I understand the Chair is opposed the amendment, and as a courtesy to him, I will be withdrawing it, but I do hope to work with my Republican colleagues to increase funding for the BER program so that the Low Dose Radiation Program can be properly funded.

Thank you, and I withdraw this amendment.

Chairman SMITH. OK. Without objection, the amendment is withdrawn. I thank the gentleman from Illinois for his thoughtful comments and will continue to work with him on the program.

Is there any further discussion or any more amendments to be offered?

And if not, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4675 to the House as amended with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 4675 to the House, as amended.

All those in favor, say aye.

And opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table, and H.R. 4675 is ordered reported to the House.

I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. And without objection, so ordered.

If there's no further discussion, that completes our business. This concludes the Science Committee markup, and without objection, we stand adjourned, but I also want to thank all the Members who came today to this markup. It wasn't expected to be long, but I always appreciate their presence. We have three doctors present on our side, all of whom will have a special interest in this bill as well, as does the gentleman from Illinois, who has the Ph.D. in physics.

So we stand adjourned.

[Whereupon, at 10:25 a.m., the Committee was adjourned.]

Appendix:

H.R. 4675, Amendment Roster

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
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115TH CONGRESS
1ST SESSION

H. R. 4675

To amend the Energy Policy Act of 2005 to provide for a low-dose radiation basic research program.

IN THE HOUSE OF REPRESENTATIVES

DECEMBER 18, 2017

Mr. MARSHALL (for himself, Mr. LIPINSKI, Mr. SMITH of Texas, and Mr. WEBER of Texas) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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A BILL

To amend the Energy Policy Act of 2005 to provide for a low-dose radiation basic research program.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Low-Dose Radiation Research Act of 2017".

SEC. 2. LOW-DOSE RADIATION RESEARCH PROGRAM.

(a) IN GENERAL.—Subtitle G of title IX of the Energy Policy Act of 2005 (42 U.S.C. 16311 et seq.) is amended by inserting after section 977 the following new section:

1 **"SEC. 977A. LOW-DOSE RADIATION RESEARCH PROGRAM.**

2 "(a) IN GENERAL.—The Secretary shall carry out a
3 basic research program on low-dose radiation to—

4 "(1) enhance the scientific understanding of,
5 and reduce uncertainties associated with, the effects
6 of exposure to low-dose radiation; and

7 "(2) inform improved risk-assessment and risk-
8 management methods with respect to such radiation.

9 "(b) PROGRAM COMPONENTS.—In carrying out the
10 program required under subsection (a), the Secretary
11 shall—

12 "(1) formulate scientific goals for low-dose radi-
13 ation basic research in the United States;

14 "(2) identify ongoing scientific challenges for
15 understanding the long-term effects of ionizing radi-
16 ation on biological systems;

17 "(3) develop a long-term strategic and
18 prioritized basic research agenda to address such
19 scientific challenges in coordination with other re-
20 search efforts;

21 "(4) leverage the collective body of knowledge
22 from existing low-dose radiation research; and

23 "(5) engage with other Federal agencies, re-
24 search communities, and potential users of informa-
25 tion produced under this section, including institu-

1 tions concerning radiation research, medical physics,
2 radiology, health physics, and emergency response.
3 "(c) COORDINATION.—In carrying out the program,
4 the Secretary, in coordination with the Physical Science
5 Subcommittee of the National Science and Technology
6 Council, shall—
7 "(1) support the directives under section 106 of
8 the American Innovation and Competitiveness Act
9 (42 U.S.C. 6601 note);
10 "(2) ensure that the Office of Science of the
11 Department of Energy consults with the National
12 Aeronautics and Space Administration, the National
13 Institutes of Health, the Environmental Protection
14 Agency, the Department of Defense, the Nuclear
15 Regulatory Commission, and the Department of
16 Homeland Security;
17 "(3) advise and assist the National Science and
18 Technology Council on policies and initiatives in ra-
19 diation biology, including enhancing scientific knowl-
20 edge of the effects of low-dose radiation on biological
21 systems to improve radiation risk-assessment and
22 risk-management methods; and
23 "(4) identify opportunities to stimulate inter-
24 national cooperation relating to low-dose radiation

1 and leverage research and knowledge from sources
2 outside of the United States.
3 "(d) RESEARCH PLAN.—Not later than 180 days
4 after the date of enactment of this Act, the Secretary shall
5 transmit to the Committee on Science, Space, and Tech-
6 nology of the House of Representatives and the Committee
7 on Energy and Natural Resources of the Senate a 4-year
8 research plan that identifies and prioritizes basic research
9 needs relating to low-dose radiation. In developing such
10 plan, the Secretary shall incorporate the components de-
11 scribed in subsection (b).
12 "(e) DEFINITION OF LOW-DOSE RADIATION.—In
13 this section, the term 'low-dose radiation' means a radi-
14 ation dose of less than 100 millisieverts.
15 "(f) RULE OF CONSTRUCTION.—Nothing in this sec-
16 tion shall be construed to subject any research carried out
17 by the Secretary for the program under this section to
18 any limitations described in 977(e) of the Energy Policy
19 Act of 2005 (42 U.S.C. 16317(e)).
20 "(g) FUNDING.—For purposes of carrying out this
21 section, the Secretary is authorized to make available from
22 funds provided to the Biological and Environmental Re-
23 search Program—
24 "(1) $20,000,000 for fiscal year 2018;
25 "(2) $20,000,000 for fiscal year 2019;

1 "(3) $30,000,000 for fiscal year 2020; and

2 "(4) $30,000,000 for fiscal year 2021.".

3 (b) CONFORMING AMENDMENT.—The table of con-

4 tents for subtitle G of title IX of the Energy Policy Act

5 of 2005 is amended by inserting after the item relating

6 to section 977 the following:

"977A. Low-dose radiation research program.".

○

AMENDMENT TO H.R. 4675

OFFERED BY MR. FOSTER OF ILLINOIS

Page 2, line 21, insert after paragraph (3) the following (and redesignate accordingly):

1 (4) identify and, to the extent possible, quan-
2 tify, potential monetary and health-related benefits
3 to Federal agencies, the general public, industry, re-
4 search communities, and other users of information
5 produced by such research program;

AMENDMENT TO H.R. 4675

OFFERED BY MR. FOSTER OF ILLINOIS

Page 4 line 20 through page 5, line 2, amend subsection (g) to read as follows:

1 "(g) FUNDING.—There are authorized to be appro-
2 priated to the Secretary for the Biological and Environ-
3 mental Research Program—
4 "(1) $632,000,000 for fiscal year 2018, of
5 which $20,000,000 shall be to carry out this section;
6 "(2) $632,000,000 for fiscal year 2019, of
7 which $20,000,000 shall be to carry out this section;
8 "(3) $642,000,000 for fiscal year 2020, of
9 which $30,000,000 shall be to carry out this section;
10 and
11 "(4) $642,000,000 for fiscal year 2021, of
12 which $30,000,000 shall be to carry out this section.

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PROCEEDINGS OF THE FULL COMMITTEE MARKUPS: H.R. 5345, AMERICAN LEADERSHIP IN SPACE TECHNOLOGY AND ADVANCED ROCKETRY ACT; H.R. 5346, COMMERCIAL SPACE SUPPORT VEHICLE ACT; AND H.R. 5086, INNOVATIONS TO ENTREPRENEURS ACT OF 2018

THURSDAY, MARCH 22, 2018

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 9:01 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order. Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee rule 2(e) and House rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today, we meet to consider H.R. 5345, the *American Leadership in Space Technology and Advanced Rocketry Act*; H.R. 5346, the *Commercial Space Support Vehicle Act*; and H.R. 5086, the *Innovators to Entrepreneurs Act of 2018*. I'll recognize myself for an opening statement. I appreciate the Members who are here. We don't expect any amendments. All these bills are bipartisan, so this should not take long. And my opening statement is going to cover all three bills, so we'll try to expedite in that way as well.

We are going—the third bill is sponsored by Representative Lipinski, and we are going to wait for him to arrive when we get to that third bill if he's not already here.

First, we will consider two space bills. Together, the two bills help ensure that America remains competitive in space. Both bills are the product of bipartisan consultation between the majority and minority Members and staff. The first space bill is H.R. 5345, the *American Leadership in Space Technology and Advanced Rocketry Act*. This bipartisan legislation, sponsored by Space Subcommittee Vice Chair Mo Brooks and cosponsored by Ed Perlmutter, directs the Marshall Space Flight Center to provide national leadership in rocket propulsion and support the development of new and emerging technologies related to rocket propulsion.

Rocket propulsion is the foundation for everything America does in space from launching satellites that help us forecast the weather and communicate around the world to exploration missions that reach out far into the solar system and beyond. The Marshall Space Flight Center's home of Huntsville, Alabama, has been at the center of rocket propulsion since the establishment of Army rocket research and development activities at the Redstone Arsenal in 1950. Marshall's expertise supports the national effort to keep our rocket propulsion industrial base vibrant and healthy and ensures that America stays at the forefront of rocket propulsion technology.

The next bill is H.R. 5346, the *Commercial Space Support Vehicle Act*. This bipartisan legislation, sponsored by Representative Bill Posey and cosponsored by Representative Al Lawson, authorizes the Secretary of Transportation to license hybrid launch vehicles to provide space support flights such as crew and space flight participant training.

The Trump Administration, under the direction of the Vice President and the National Space Council, has tasked the Secretary of Transportation to reform commercial space launch regulations by March 1, 2019. The bill instructs the Transportation Secretary to consult with the commercial space industry prior to issuing the notice of proposed rulemaking and to issue space support vehicle licensing regulations by March 1, 2019. The intent of this provision is to make these new commercial space support vehicle licenses part of the reform effort.

I want to thank this bill's sponsor, Representative Bill Posey, for his longstanding support of the commercial space industry and for his persistence on this space commerce regulatory reform effort.

The final bill is H.R. 5086, the *Innovators to Entrepreneurs Act*. The bill extends the National Science Foundation's Innovation Corps (I-Corps) program, which trains and prepares scientists and engineers to convert their research results into entrepreneurial opportunities. H.R. 5086 expands who is eligible to participate in I-Corps courses, allowing Small Business Innovation Research and Small Business Technology Transfer grants to be used to cover I-Corps training expenses. The bill also authorizes a new I-Corps course that teaches skills, including company organization, attracting investors, and hiring.

I thank Representative Dan Webster and Research and Technology Subcommittee Ranking Member Dan Lipinski for their work on this legislation.

PREPARED STATEMENT OF CHAIRMAN SMITH

Today we meet to consider three bills.

First, we will consider two space bills. Together, the two bills help ensure that America remains competitive in space. Both bills are the product of bipartisan consultation between the majority and minority members and staff.

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The bill also authorizes a new I-Corps course that teaches skills including company organization, attracting investors and hiring.

I thank Rep. Daniel Webster and Research and Technology Subcommittee Ranking Member Dan Lipinski for their work on this legislation.

Chairman SMITH. And that concludes my opening statement, and the Ranking Member today, the gentleman from Illinois, Mr. Lipinski, is recognized for his opening statement.

Mr. LIPINSKI. Thank you, Chairman Smith, for holding today's bipartisan markup. The first bill we're considering is *American Leadership in Space Technology and Advanced Rocketry Act* sponsored by Mr. Brooks.

This bill recognizes the rocket propulsion work of the Marshall Space Flight Center. That work, as well as all the other work that's carried out at our various NASA centers around the country, is vital to American technological advancement in aerospace, and it's worthwhile that we recognize that.

I've had the opportunity to visit the—visit Marshall, and it was very impressive. I'm glad that I've had the opportunity to do that when I was down with Mr. Brooks a few years ago holding a field hearing down there, so it was good to get to experience that myself and all the work that they're doing there.

Second, we will consider the *Commercial Space Support Vehicle Act* introduced by Congressman Posey. This bill amends existing law to provide the Secretary of Transportation with authority to license or permit space support vehicles for space support flights such as crew training or research and development that are related to space launch or reentry.

I understand that the goal of these amendments is to provide the industry with greater statutory clarity, as well as to simplify the licensing process for commercial space missions. To that end, I think we should get feedback from the affected industry and make

any appropriate adjustments to the legislation before we move toward enactment.

In addition, Mr. Chairman, it is important that FAA's Office of Commercial Space Transportation is sufficiently resourced to accommodate any additional work so that the office can continue to focus on its core responsibilities of licensing and permitting commercial space launch and reentry vehicles. The U.S. commercial space launch industry is really in a resurgence right now, and we need to be doing what we can to ensure that research continues.

And third, we are marking up—the bill we are marking up is H.R. 5086, the bill that I introduced, the *Innovators to Entrepreneurs Act of 2018*, which is cosponsored by Mr. Weber and Ranking Member Johnson. This bill seeks to expand participation in the National Science Foundation's highly successful I-Corps program and to broaden the scope of curriculum offered.

The I-Corps program helps increase the return on investment to Federal R&D dollars in the form of increased jobs and economic opportunity. And I'll say more about that when the bill is brought up. But I want to thank the Chairman for—especially on that bill—on my bill, bringing that up and being willing to work with me on that. And I thank the Chairman for, you know, all of these bipartisan bills that we are working on here today, so thank you.

With that, I'll yield back.

PREPARED STATEMENT OF MR. LIPINSKI

Thank you Chairman Smith for holding today's bipartisan markup. The first bill we are considering is the *American Leadership in Space Technology and Advanced Rocketry Act*, sponsored by Mr. Brooks. This bill recognizes the rocket propulsion work of the Marshall Space Flight Center. That work, as well as all the other work that is carried out at our various NASA centers around the country, is vital to American technological advancement in aerospace, and it is worthwhile to recognize that.

Second, we will consider the *Commercial Space Support Vehicle Act*, introduced by Congressman Posey. This bill amends existing law to provide the Secretary of Transportation with authority to license or permit space support vehicles for space support flights, such as crew training or research and development, that are related to space launch or reentry. I understand that the goal of these amendments is to provide the industry with greater statutory clarity, as well as to simplify the licensing process for commercial space missions. To that end, I think we should get feedback from the affected industry and make any appropriate adjustments to the legislation before we move towards enactment.

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Third, the bill we are marking up is H.R. 5086, my *Innovators to Entrepreneurs Act of 2018*, cosponsored by Mr. Webster and Ranking Member Johnson. This bill seeks to expand participation in the National Science Foundation's highly successful I-Corps program and to broaden the scope of curriculum offered. The I-Corps program helps increase the return on investment to Federal R&D dollars in the form of increased jobs and economic output.

Thank you for calling today's markup, and I yield back.

Chairman SMITH. Thank you, Mr. Lipinski.

H.R. 5345

Chairman SMITH. And pursuant to notice, I call up H.R. 5345, the *American Leadership in Space Technology and Advanced Rocketry Act*, and the clerk will report the bill.

The CLERK. H.R. 5345, a bill to designate the Marshall Space Flight Center of the National Aeronautics and Space Administration to provide leadership for the U.S. rocket propulsion industrial base and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And the bill's sponsor, the gentleman from Alabama, Mr. Brooks, is recognized for his opening statement.

Mr. BROOKS. Take this opportunity to thank Chairman Smith and Representative Perlmutter for the roles that they played in allowing this bill to come up, and especially Representative Perlmutter for agreeing to cosponsor it in a very bipartisan fashion.

As the Congressman for the Tennessee Valley of north Alabama, I appreciate and understand the unique and valuable contribution that rocket propulsion has provided America.

On a more personal note, I very well remember growing up as a young lad in Huntsville, Alabama, as the Saturn V rockets were test-fired not far away. The earth would shake, the windows would rattle, and the dishes would sometimes fall out of the cabinets. I didn't understand the full meaning of that, though, until 1969 when it was those rockets that allowed America to be the first and only Nation to date that has been able to send astronauts to the moon and successfully return them.

The best way forward for the United States to maintain its leadership position in space exploration utilization is to support our Nation's work and investment in rocket propulsion because rocket propulsion is the foundational capability for everything we do in space.

By way of background, in my district the Marshall Space Flight Center provides expertise in solid and liquid rocket propulsion, as well as advanced rocket propulsion technology to enable a wide array of future activity in space.

Over the last several years, America has witnessed the beginnings of a resurgence in the rocket propulsion industry. As these traditional and emerging actors continue to move forward, it is important that we support healthy cooperation and communication between these companies and the Federal Government to ensure that America maintains a robust and healthy rocket propulsion industry.

As this Committee continues its work to guide our national space policy, we must ensure a strong foundation and bold leadership in rocket propulsion, a robust industrial base that can develop and capitalize on better rocket propulsion technology. Therefore, I have introduced the *American Leadership in Space Technology and Advanced Rocketry Act of 2018*, also known as the *ALSTAR Act*.

At this point, let me read two paragraphs from the act that pretty well summarize the intent of this legislation. In effect, ALSTAR formalizes and preserves the Marshall Space Flight Center's historical role in rocket propulsion. Quoting from the act, "It is the sense of Congress that the Marshall Space Flight Center is the National Aeronautics and Space Administration's lead center for rocket propulsion and essential to sustaining and promoting U.S. leadership in rocket propulsion and developing the next generation of rocket propulsion capabilities. The Marshall Space Flight Center shall

provide national leadership in rocket propulsion," thereafter listing a number of ways in which the Marshall Space Flight Center is to do that.

This bill helps to ensure the long-term stability of the rocket propulsion industry through better coordination and collaboration between all relevant stakeholders, Federal and private. This bill also directs Marshall to explore, develop, and mature new rocket propulsion technology in cooperation with partners across and outside of government. This new growth, while building on a strong foundation, will ensure that America remains at the forefront of space exploration.

NASA must once again challenge itself to reach far beyond its limits. Through attention, focus, and support of the utilization of space and the exploration of deep space, we will be able to once again inspire the next generation to look to the starts and aspire to do the impossible.

Mr. Chairman, I yield back.

Chairman SMITH. Thank you, Mr. Brooks.

Does the—I am glad to see that the cosponsor of the legislation seeks to be recognized. We want him to be on the record. And the gentleman is so recognized.

Mr. PERLMUTTER. Thank you, Mr. Chair. And I want to thank Mr. Brooks for bringing this piece of legislation. And I wanted to support this legislation and cosponsor it because Huntsville, the Marshall Space Center, is one of 10 centers that NASA uses to make sure that we're preeminent in the space program and that we will get our astronauts out there, we will get our robots out into outer space. We will explore.

And the historic role that Huntsville has played in the space program is its current role and now will be its future role, to be at the center of getting our space program into outer space, pretty simple, but I wanted to encourage this network that we have that is really second to none in the world, and we've got to keep it that way.

So, for me, cosponsoring this bill was very easy. It is something that I think will remind people, whether they're in Alabama or Colorado or California, that this is important to America, that our role and our willingness to explore and get our capsules and our people into outer space is key. And Huntsville plays a critical role in that, and that's why I support this bill.

And I yield back.

Chairman SMITH. Thank you, Mr. Perlmutter.

If there's no further discussion, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5345 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 5345 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. Congratulations to you all.

H.R. 5346

Chairman SMITH. Pursuant to notice, I now call up H.R. 5346, the *Commercial Space Support Vehicle Act*, and the clerk will report the bill.

The CLERK. H.R. 5346, a bill to amend title 51, United States Code, to provide for licenses and experimental permits for space support vehicles and for other purposes.

Chairman SMITH. And without objection, the bill is considered as read and open for amendment at any point.

And the gentleman from Florida, Mr. Posey, is recognized for his statement.

Mr. POSEY. Thank you very much, Mr. Chairman. And I want to first and foremost thank the staff for their diligence in perfecting this legislation that we need.

A GAO report last year recommended that the Federal Aviation Administration examine its current regulatory framework for space support vehicles and suggest legislative or regulatory changes as applicable. The *Commercial Space Vehicle Support Act* was largely developed with input from the Department of Transportation report on the permitting process of hybrid launch vehicles to enable non-launch flight operations. NASA has used them for years to conduct parabolic experiments where they go up and down and do the gravity-sensitivity checks that they want. It's much cheaper to use an F–104 than it is to launch a rocket costing millions of dollars to do those kind of experiments.

The Department of Transportation report concluded that the option of having a single statutory regime and regulatory office oversee a demonstrated commercial space program throughout its operational lifecycle would allow consistent application of regulatory philosophy and safety oversight and be more efficient and cost-effective for the launch operator, as well as the licensing agency.

The *Commercial Space Support Vehicle Act* provides an appropriate regulatory approach by authorizing the Secretary of Transportation to develop regulations by March 1, 2019, allowing license space support flights.

I'd like to ask unanimous consent to include in the record a letter of support from Virgin Galactic for H.R. 5346, the *Commercial Space Support Vehicle Act*.

Chairman SMITH. OK. Without objection, so ordered.

Mr. POSEY. As mentioned by Chairman Smith and the Ranking Member Lipinski, the intent is to include the development of regulations in the regulatory reform process that the Vice President and the National Space Council tasks the Federal Aviation Administration to comply by the date previously mentioned. I thank you very much and yield back.

Chairman SMITH. Thank you, Mr. Posey.

If there is no further discussion, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5346 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 5346 to the House.

All those in favor, say aye.

Opposed, say nay.

The ayes have it, and the bill is ordered reported—ordered—is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table.

H.R. 5086

Chairman SMITH. Pursuant to notice, we call up H.R. 5086, the *Innovators to Entrepreneurs Act of 2018*. And the clerk will report the bill.

The CLERK. H.R. 5086, a bill to require the Director of the National Science Foundation to develop an I-Corps course to support commercialization-ready innovation companies and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And we will now recognize the bill's sponsor, the gentleman from Illinois, Mr. Lipinski, for his statement.

Mr. LIPINSKI. Thank you, Mr. Chairman.

As you and Members of this Committee are aware, I've been the leading advocate—putting it mildly—for the National Science Foundation Innovation Corps or I-Corps program since its inception. I led the legislative effort that authorized I-Corps as part of the *American Innovation and Competitiveness Act* that became law at the end of the last Congress.

The I-Corps program offers valuable entrepreneurial education primarily to scientists and engineers who are college research faculty, graduate students, and postdoctoral fellows. The purpose is to help these individuals develop new, innovative products from the world-class research they conduct in their labs. The program has had tremendous success at NSF and has been expanded to other agencies, including DOE, NIH, DOD, USDA, and DHS. It has helped create new entrepreneurs and new tech jobs and is helping Federal taxpayers get the most out of their investment in research.

The I-Corps program has been successful in part due to its focus on providing education and mentoring tailored to the needs of entrepreneurs at their particular business stage. To date, that focus has been on the point at which they're first attempting to create a product based on research they've conducted in the lab, but different types of support are needed at later States as the entrepreneur forms a company and progresses toward introducing the product to market.

Currently, once a team completes an I-Corps course and decides to take their innovation to market, they must learn how to form and grow a company on their own. Many scientists and engineers are struggling to acquire the necessary skills, and as a result, too many early stage companies are failing.

To address this, NSF has piloted a course called I-Corps Go to teach skills like selecting a company structure, attracting investors and hiring a team. Due to the popularity and early success of this course, this bill aims to make it a formal component of the I-Corps program to be offered nationwide.

This bill also aims to expand participation in I-Corps without a significant increase in funding. Although I'd support increasing the NSF's funding in general and I-Corps funding in particular, at the Chairman's request, I am moving this bill forward with only a

small authorization. The way this bill will increase participation is to allow any small business innovation research or small business technology transfer research grantee from any Federal agency to use their grant funds to participate in I-Corps. The bill also allows private citizens and entities to pay out of pocket to participate. Increased access to and participation in I-Corps will ensure that more American innovators have access to high-quality entrepreneurial education.

The final provision of this bill is to require a Government Accountability Office report on the I-Corps program. Although NSF submits periodic reports about the program to Congress, to date, there has not been an independent review of its performance.

I fully support I-Corps and continue to be amazed by its success, but as with any taxpayer-funded program, I also support independent auditing to help us learn how to improve the program. The Federal Government invests billions of dollars in research and development annually. I-Corps is a modest investment that leads to a big return on federally funded research by significantly increasing rates of research commercialization, economic activity, and job creation.

Just as the creation of I-Corps program addressed an unmet need and helped scientists entrepreneurs bring their ideas closer to market, the *Innovators to Entrepreneurs Act* will fill an additional skills gap and empower more aspiring job creators to access the private capital they need to be commercially successful.

I want to thank Mr. Webster and Ranking Member Johnson for their support and co-sponsorship of this bill. I also thank Chairman Smith for holding an I-Corps hearing this past December and for bringing up this bipartisan bill for a markup.

The I-Corps program has been one of the most remarkable, maybe the most remarkable program that I have seen in my time here in Congress for what it's been able to do to tap into the great research that is being done at our—you know, at our research universities, also starting to reach into the national labs, and it really does a great job of helping to really take those great innovators that we have, the great researchers that we have, teach them how to be entrepreneurs. It's been very successful. It helps to bring back a good return on taxpayer dollars and create jobs, and it's something that we all support and we all want, and I encourage all my colleagues to vote in favor.

And I'll yield back.

Chairman SMITH. Thank you, Mr. Lipinski.

And the gentleman from Florida, the cosponsor of the legislation, Mr. Webster, is recognized for his statement.

Mr. WEBSTER. Thank you so much, Mr. Chairman, and thank you for allowing us to be able to come forward. I thank my friend Mr. Lipinski for filing this. He's certainly known as a champion of I-Corps and maybe the champion of I-Corps, so I'm very appreciative of that.

This is a great piece of legislation, as the sponsor has said. The idea of helping the scientists and engineers and others who develop products, getting them to market is an important thing because you can have a product, but if you don't sell it, it doesn't really do anybody any good.

So through marketing and hiring and organizing and attracting investors and so forth, the participants in these I-Corps groups have a better chance of being successful, and that's the whole idea. I've seen in Florida what a great program it is, and it has greatly benefited our State, and I know it has in the rest of the country. There have just been barriers, barriers that could not be penetrated. You couldn't get through. This bill is going to help break down those barriers so that those who are developing their product can also get them to market.

So I would certainly urge everyone on this Committee to vote for this great bipartisan bill. I think it's going to be one of the most commonsense bills passed by this Congress.

Chairman SMITH. That's high praise. Thank you, Mr. Webster. I appreciate your comments.

If there is no further discussion, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5086 to the House with a recommendation that the bill be approved.

The question is on favorably reporting H.R. 5086 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table.

Before we officially adjourn, I think it might be of interest to Members to know that of the 25 bills that we have—that this Committee has taken to the House floor, 23 of the 25 have been bipartisan bills, and that's got to be some kind of record.

If there's no further discussion, that completes our business, and this concludes the Science Committee markup. Without objection, the Committee stands adjourned, and thank you all again for your attendance.

[Whereupon, at 9:26 a.m., the Committee was adjourned.]

Appendix:

H.R. 5345, H.R. 5346, H.R. 5086

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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To designate the Marshall Space Flight Center of the National Aeronautics and Space Administration to provide leadership for the U.S. rocket propulsion industrial base, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. BROOKS of Alabama introduced the following bill; which was referred to the Committee on _____

A BILL

To designate the Marshall Space Flight Center of the National Aeronautics and Space Administration to provide leadership for the U.S. rocket propulsion industrial base, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "American Leadership in Space Technology and Advanced Rocketry Act" or the "ALSTAR Act".

1 **SEC. 2. FINDINGS.**

2 Congress finds the following:

3 (1) Rocket propulsion is an enabling technology
4 for our Nation's future prosperous way of life.

5 (2) Rocket propulsion technologies are critical
6 to national security, intelligence gathering, commu-
7 nications, weather forecasting, navigation, commu-
8 nications, entertainment, land use, Earth observa-
9 tion, and scientific exploration.

10 (3) The rocket propulsion industry is a source
11 of high-quality jobs.

12 (4) Multiple Federal agencies and companies
13 are involved in rocket propulsion research, develop-
14 ment, and manufacturing.

15 (5) Integration, coordination, and cooperation
16 would strengthen the United States rocket propul-
17 sion industrial base.

18 (6) Erosion of the rocket propulsion industrial
19 base would seriously impact national security, space
20 exploration potential, and economic growth.

21 (7) The Marshall Space Flight Center has dec-
22 ades of experience working with other Government
23 agencies and industry partners to study and coordi-
24 nate these capabilities.

25 (8) The Marshall Space Flight Center has made
26 historic and unique contributions—

1 (A) by bringing stakeholders together to
2 work on rocket propulsion industrial base
3 sustainment;
4 (B) of technical expertise to key studies
5 and review boards; and
6 (C) by consistently participating in inter-
7 agency working groups to address rocket pro-
8 pulsion issues.

9 **SEC. 3. ROCKET PROPULSION LEADERSHIP.**

10 (a) SENSE OF CONGRESS.—It is the sense of Con-
11 gress that the Marshall Space Flight Center is the Na-
12 tional Aeronautics and Space Administration's lead center
13 for rocket propulsion and is essential to sustaining and
14 promoting U.S. leadership in rocket propulsion and devel-
15 oping the next generation of rocket propulsion capabilities.
16 (b) LEADERSHIP IN ROCKET PROPULSION.—The
17 Marshall Space Flight Center shall provide national lead-
18 ership in rocket propulsion by—
19 (1) contributing to interagency coordination for
20 the preservation of critical national rocket propul-
21 sion capabilities;
22 (2) collaborating with industry, academia, and
23 professional organizations to most effectively use na-
24 tional capabilities and resources;

1 (3) monitoring public- and private-sector rocket
2 propulsion activities to develop and promote a
3 strong, healthy rocket propulsion industrial base;
4 (4) facilitating technical solutions for existing
5 and emerging rocket propulsion challenges;
6 (5) supporting the development and refinement
7 of rocket propulsion for small satellites;
8 (6) evaluating and recommending, as appro-
9 priate, new rocket propulsion technologies for fur-
10 ther development; and
11 (7) providing information required by national
12 decisionmakers so that policies and other instru-
13 ments of the Government support the development
14 and strengthening of the Nation's rocket propulsion
15 capabilities throughout the 21st century.

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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To amend title 51, United States Code, to provide for licenses and experimental permits for spaee support vehicles, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To amend title 51, United States Code, to provide for licenses and experimental permits for space support vehicles, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Commercial Space Support Vehicle Act".

SEC. 2. DEFINITIONS.

Section 50902 of title 51, United States Code, is amended—

1 (1) by redesignating paragraphs (21) through
2 (25) as paragraphs (23) through (27), respectively;
3 and
4 (2) by inserting after paragraph (20) the fol-
5 lowing:
6 "(21) 'space support flight' means a flight
7 in the air that is—
8 "(A) not a launch or reentry; but
9 "(B) related to launch or reentry serv-
10 ices.
11 "(22) 'space support vehicle' means a vehi-
12 cle that is—
13 "(A) a launch vehicle;
14 "(B) a reentry vehicle; or
15 "(C) a component of a launch or re-
16 entry vehicle.".

17 **SEC. 3. LICENSING OF SPACE SUPPORT FLIGHTS.**

18 (a) IN GENERAL.—Section 50904 of title 51, United
19 States Code, is amended by adding at the end the fol-
20 lowing:
21 "(e) SPACE SUPPORT FLIGHTS.—
22 "(1) The Secretary of Transportation may issue
23 or transfer a license for multiple space support
24 flights of a space support vehicle to a citizen of the
25 United States, but only if such citizen holds an oper-

ator license issued under this chapter for launch or reentry of such space support vehicle as, or included as a component of, a launch vehicle or reentry vehicle.

"(2) A licensee may only carry out a space support flight of a space support vehicle under a license for carrying a person or property for compensation or hire if such flight lands at the same site from which the vehicle took flight.".

(b) LIMITATION ON WAVIER OF REQUIREMENTS.—Section 50905(b)(3) of title 51, United States Code, is amended by inserting ", or the operation of a space support vehicle," after "or a reentry vehicle".

SEC. 4. EXPERIMENTAL PERMITS FOR SPACE SUPPORT FLIGHTS.

Section 50906 of title 51, United States Code, is amended—

(1) by striking subsection (d) and inserting the following:

"(d) The Secretary may issue a permit only for—

"(1) reusable suborbital rockets or reusable launch vehicles that will be launched into a suborbital trajectory or reentered under that permit solely for—

"(A) research and development to test design concepts, equipment, or operating techniques;

"(B) showing compliance with requirements as part of the process for obtaining a license for launch or reentry under this chapter; or

"(C) crew training for a launch or reentry using the design of the rocket or vehicle for which the permit would be issued; or

"(2) a space support vehicle, or a vehicle that is in development to become a space support vehicle, operated by a citizen of the United States for space support flights that will be conducted under the permit for, or in support of, the purposes described in subparagraphs (A) through (C) of paragraph (1).";

and

(2) by striking subsection (h) and inserting the following:

"(h) No person may, under a permit, operate a reusable suborbital rocket, reusable launch vehicle, or space support vehicle for carrying any property or human being for compensation or hire.".

1 **SEC. 5. COMMUNICATION AND TRANSPARENCY.**

2 Nothing in this Act or the amendments made by this
3 Act shall be construed to limit the authority of the Sec-
4 retary of Transportation to discuss potential regulatory
5 approaches, potential performance standards, or any other
6 topic related to this Act and the amendments made by
7 this Act with the commercial space industry prior to the
8 issuance of a notice of proposed rulemaking.

9 **SEC. 6. APPLICABILITY.**

10 (a) IN GENERAL.—The amendments made by this
11 Act shall take effect on March 1, 2019.

12 (b) REGULATIONS.—The Secretary of Transportation
13 may issue such regulations as are necessary to carry out
14 the amendments made by this Act beginning on the date
15 of enactment of this Act.

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I

115TH CONGRESS
2D SESSION

H. R. 5086

To require the Director of the National Science Foundation to develop an I-Corps course to support commercialization-ready innovation companies, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 26, 2018

Mr. LIPINSKI (for himself and Mr. WEBSTER of Florida) introduced the following bill; which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Small Business, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To require the Director of the National Science Foundation to develop an I-Corps course to support commercialization-ready innovation companies, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Innovators to Entrepreneurs Act of 2018".

SEC. 2. FINDINGS.

Congress finds the following:

1 (1) The National Science Foundation Innova-
2 tion Corps Program (hereinafter referred to as "I-
3 Corps"), created administratively by the Foundation
4 in 2011 and statutorily authorized in the American
5 Innovation and Competitiveness Act, has succeeded
6 in increasing the commercialization of Government-
7 funded research.
8 (2) I-Corps provides valuable entrepreneurial
9 education to graduate students, postdoctoral fellows,
10 and other researchers, providing formal training for
11 scientists and engineers to pursue careers in busi-
12 ness, an increasingly common path for advanced de-
13 gree holders.
14 (3) The I-Corps Teams program is successful in
15 part due to its focus on providing the specific types
16 of education and mentoring entrepreneurs need
17 based on the early stage of their companies, however
18 the program does not provide similar support to
19 them at later stages.
20 (4) The success of I-Corps in the very early
21 stages of the innovation continuum should be ex-
22 panded upon by offering additional entrepreneurship
23 training to small businesses as they advance toward
24 commercialization.

(5) The excellent training made available to grantees of participating agencies through the I-Corps Program should be made available to all Federal grantees as well as other businesses willing to pay the cost of attending such training.

(6) The success of the I-Corps Program at promoting entrepreneurship within research institutions and encouraging research commercialization has been due in part to the National Science Foundation's efforts to date on building a national network of science entrepreneurs, including convening stakeholders, promoting national I-Corps courses, cataloguing best practices and encourage sharing between sites and institutions, and developing a mentor network.

(7) As the I-Corps Program continues to grow and expand, the National Science Foundation should maintain its focus on networking and information sharing to ensure that innovators across the country can learn from their peers and remain competitive.

SEC. 3. EXPANDED PARTICIPATION IN I-CORPS.

Section 601(c)(2) of the American Innovation and Competitiveness Act (42 U.S.C. 1862s–8(c)(2)) is amended by adding at the end the following:

"(C) ADDITIONAL PARTICIPANTS.—

1 "(i) ELIGIBILITY.—The Director, in
2 consultation with relevant stakeholders, as
3 determined by the Director, which may in-
4 clude Federal agencies, I-Corps regional
5 nodes, universities, and public and private
6 entities engaged in technology transfer or
7 commercialization of technologies, shall
8 provide an option for participation in an I-
9 Corps Teams course by—
10 "(I) Small Business Innovation
11 Research Program grantees; and
12 "(II) other entities, as deter-
13 mined appropriate by the Director.
14 "(ii) COST OF PARTICIPATION.—The
15 cost of participation by a Small Business
16 Innovation Research Program grantee in
17 such course may be provided—
18 "(I) through I-Corps Teams
19 grants;
20 "(II) through funds awarded to
21 grantees under the Small Business In-
22 novation Research Program or the
23 Small Business Technology Transfer
24 Program;

"(III) by the grantor Federal agency of the grantee using funds set aside for the Small Business Innovation Research Program under section 9(f)(1) of the Small Business Act (15 U.S.C. 638(f)(1));

"(IV) by the grantor Federal agency of the grantee using funds set aside for the Small Business Technology Transfer Program under section 9(n)(1) of the Small Business Act (15 U.S.C. 638(n)(1)); or

"(V) by the participating teams.".

SEC. 4. I-CORPS COURSE FOR COMMERCIALIZATION-READY PARTICIPANTS.

(a) IN GENERAL.—In carrying out the I-Corps program described in section 601(c) of the American Innovation and Competitiveness Act (42 U.S.C. 1862s–8(c)), the Director shall develop an I-Corps course offered by I-Corps regional nodes to support commercialization-ready participants. Such course shall include skills such as attracting investors, scaling up a company, and building a brand.

1 (b) ENGAGEMENT WITH RELEVANT STAKE-
2 HOLDERS.—In developing the course under subsection (a),
3 the Director may consult with the heads of such Federal
4 agencies, universities, and public and private entities as
5 the Director determines to be appropriate.
6 (c) ELIGIBLE PARTICIPANTS.—The course developed
7 under subsection (a) shall—
8 (1) support participants that have completed an
9 I-Corps Teams course;
10 (2) support participants that have made the de-
11 cision to take an innovation to market.
12 **SEC. 5. REPORT.**
13 Not later than 2 years after the date of enactment
14 of this Act, the Comptroller General of the United States
15 shall submit to Congress a report containing an evaluation
16 of the I-Corps program described in section 601(c) of the
17 American Innovation and Competitiveness Act (42 U.S.C.
18 1862s–8(c)). Such evaluation shall include an assessment
19 of the effects of I-Corps on—
20 (1) the commercialization of Federally funded
21 research and development;
22 (2) the higher education system; and
23 (3) regional economies and the national econ-
24 omy.

SEC. 6. FUNDING.

From funds otherwise provided to the National Science Foundation, a total of $5,000,000 shall be made available for fiscal years 2019 and 2020 to carry out the activities described in section 4 and the amendment made by section 3.

○

COMMITTEE MARKUPS OF H.R. 1224, H.R. 1430, H.R. 1431, H.R. 2105, H.R. 2809, H.R. 2763, H.R. 1159, H.R. 4376, H.R. 4377, H.R. 4378, H.R. 4375, H.R. 4323, H.R. 4254, H.R. 3397, H.R. 4675, H.R. 5345, H.R. 5346, H.R. 5086, H.R. 5509, H.R. 5503, H.R. 5905, H.R. 5907, H.R. 5906, H.R. 6227, H.R. 6229, H.R. 6226, H.R. 6398, S. 141, AND H.R. 6468

COMPILATION OF MARKUPS

BEFORE THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

FIRST AND SECOND SESSIONS

2017–2018

Serial No. CP: 115–1

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Printed for the use of the Committee on Science, Space, and Technology

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Printed for the use of the Committee on Science, Space, and Technology

Available via the World Wide Web: http://science.house.gov

U.S. GOVERNMENT PUBLISHING OFFICE

35–710PDF WASHINGTON : 2019

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C O N T E N T S

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PROCEEDINGS OF THE FULL COMMITTEE MARKUPS: H.R. 5509, INNOVATIONS IN MENTORING, TRAINING, AND APPRENTICESHIPS ACT; AND H.R. 5503, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT OF 2018

TUESDAY, APRIL 17, 2018

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:05 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order. Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee rule 2(e) and House rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today, we meet to consider H.R. 5509, the *Innovations in Mentoring, Training, and Apprenticeships Act*; and H.R. 5503, the *National Aeronautics and Space Administration Authorization Act of 2018*.

H.R. 5509

Chairman SMITH. Pursuant to notice, I now call up H.R. 5509, the *Innovations in Mentoring, Training, and Apprenticeships Act*. And the clerk will report the bill.

The CLERK. H.R. 5509, a bill to direct the National Science Foundation to provide grants for research about STEM education approaches and the STEM-related work force and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And I'll recognize myself for an opening statement.

Before I do so, I appreciate the good attendance we have this morning, and I want to introduce our newest and youngest member of the staff, and that is Mark Marin's youngest daughter sitting behind me, Alden, almost age 10. And we appreciate Alden's being here.

And I should warn everybody in the room that if crowd control is required, Alden is going to wield the gavel. So we're happy to have her here.

And again, I'll go back to my opening statement.

This morning, the Committee will consider H.R. 5509, the *Innovations in Mentoring, Training, and Apprenticeships Act*. This legislation was introduced by Majority Leader McCarthy. I and Ranking Member Eddie Bernice Johnson have cosponsored this measure, and I hope others will, too.

H.R. 5509 is the product of a hearing held by the Research and Technology Subcommittee in February. Members and witnesses discussed innovative work force training approaches aimed at boosting STEM education and careers in order to meet current and future STEM professional and technical work force needs. A special thanks to Chairwoman Comstock and Ranking Member Lipinski for holding that hearing.

Meeting our growing work force needs in all areas of science and technology is essential for our economic competitiveness. For instance, according to a recent study, there will be a need for 3.5 million skilled manufacturing workers over the next decade. But it is anticipated that 2 million of those jobs will go to—go unfilled unless we recruit and educate a whole host of high-skilled manufacturing workers.

H.R. 5509 continues the bipartisan progress this Committee has made to improve and expand science, technology, engineering, and mathematics. We extended the program's educational programs and created new pathways to STEM careers.

Research shows that direct knowledge and hands-on work experience with STEM occupations and opportunities stimulate interests in STEM studies and careers among students at every level. To this end, H.R. 5509 directs the National Science Foundation to fund initiatives that support innovative partnerships between academic institutions and local industries.

The NSF is to offer at least $5 million per year over the next 4 years for competitively awarded grants to community colleges to develop new STEM courses and degrees. These programs will combine formal education with on-the-job work experiences, such as apprenticeships and internships, by partnering with local employers. The bill also requires at least $2.5 million per year over the next 4 years for the NSF to award research grants to measure student outcomes and the effectiveness of computer-based and online courses for technical skills training.

Successful work force development programs extend beyond the four walls of classrooms and laboratories. One primary example is at Wichita State University, which Mr. Marshall and I visited last year. During his testimony, Dr. John Bardo, the President of Wichita State University, discussed the university's testing of its applied learning initiative. The university found that, on average, newly graduated engineers take 2 years to contribute to the bottom line for their employers. However, when Wichita State University students were given an opportunity to participate in an apprenticeship program prior to graduation, that timeline to profitability was cut from 2 years to 6 months.

The pending legislation directs the NSF to award at least another $2.5 million per year for the next 4 years for universities to partner with local employers and offer paid apprenticeships and other applied learning experiences to STEM students.

Not only can we learn from successful programs here in the United States, it is also important to examine how other developed nations address their skilled technical work force needs. This bill directs the NSF to commission research that compares and contrasts skilled technical work force development between the United States and other developed nations and to report the results to Congress.

H.R. 5509 requires the National Science Foundation to conduct research to improve the efficiency of the skilled technical labor markets and examine the skilled technical work force to have a clear understanding of work force trends and needs. The *Innovations in Mentoring, Training, and Apprenticeships Act*, H.R. 5509, is a significant step in the right direction toward ensuring the United States' competitiveness in the global economy of today. The initiatives in this legislation will leverage the hard work and ingenuity of women and men of all ages, education levels, and backgrounds to grow and meet the demand for a STEM-capable work force, so I encourage my colleagues to support this bill.

PREPARED STATEMENT OF CHAIRMAN SMITH

This morning the committee will consider H.R. 5509, the *Innovations in Mentoring, Training, and Apprenticeships Act*. This legislation was introduced by Majority Leader McCarthy. I have cosponsored this measure and I hope others will too.

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For instance, according to a recent study, there will be a need for 3.5 million skilled manufacturing workers over the next decade. But it is anticipated that 2 million of those jobs will go unfilled unless we recruit and educate a whole host of high-skilled manufacturing workers.

H.R. 5509 continues the bipartisan progress this committee has made to improve and expand science, technology, engineering and mathematics (STEM) education programs and create new pathways to STEM careers.

Research shows that direct knowledge and hands-on work experience with STEM occupations and opportunities stimulate interests in STEM studies and careers among students at every level. To this end, H.R. 5509 directs the National Science Foundation (NSF) to fund initiatives that support innovative partnerships between academic institutions and local industries.

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H.R. 5509 requires the NSF to conduct research to improve the efficiency of the skilled technical labor markets and examine the skilled technical workforce to have a clear understanding of workforce trends and needs.

The *Innovations in Mentoring, Training, and Apprenticeships Act*, H.R. 5509, is a significant step in the right direction towards ensuring the United States' competitiveness in the global economy of today.

The initiatives in this legislation will leverage the hard work and ingenuity of women and men of all ages, education levels and backgrounds to grow and meet the demand for a STEM-capable workforce.

I encourage my colleagues to support this bill and I yield back the balance of my time.

Chairman SMITH. And I now recognize the Ranking Member, the gentlewoman from Texas, Ms. Johnson.

Ms. JOHNSON. Thank you very much, Chairman Smith. Today, we are marking up two bills, one good one, and one bad one. H.R. 5509, the *Innovations in Mentoring, Training, and Apprenticeships Act*, is a good bill, and I support it.

Research has shown that we are experiencing a significant STEM skills gap in this country. Employers are struggling to find workers with the technical skills they need. My area is a prime example. One cause for the gap is a lack of coordination between educational institutions and industry. Skills taught in secondary and postsecondary schools are not aligned with the skills in high demand by employers. With an economy that is increasingly data-driven and reliant on rapidly evolving technologies, we must ensure our work force can keep pace.

Apprenticeships are a work force development strategy that enables close coordination between high schools, vocational schools, universities, and local employers. Although other nations have enjoyed the benefits of apprenticeships for decades, apprenticeships remain unutilized in this country.

This bill is a positive step in the right direction and is a recognition and endorsement of good work that the National Science Foundation is doing in this area. A strong STEM work force poised to take on the challenges of a 21st century economy is vital for continued growth, security, and global competitiveness.

With regards to H.R. 5509, the Chairman and his staff responded positively to suggestions and concerns of the minority and to the feedback from the National Science Foundation and modified the bill to improve it. I appreciate these efforts, and I support passage of this bill.

I see we also have amendments offered by the gentlelady from Oregon that make some improvements to the bill, and I look forward to hearing about those amendments and supporting them.

Thank you, and I yield back.

PREPARED STATEMENT OF MS. JOHNSON

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I see we also have amendments offered by the gentlelady from Oregon to make some improvements to the bill, and I look forward to supporting those amendments as well.

Thank you, and I yield back.

Chairman SMITH. Thank you, Ms. Johnson. We have two amendments on the list, both to be offered by the gentlewoman from Oregon, Ms. Bonamici. The first is well-intended; the second is good. And the gentlewoman is recognized to offer the first one.

Ms. BONAMICI. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 5509 offered by Ms. Bonamici of Oregon, amendment 070.

Chairman SMITH. And, without objection, the amendment is considered as read and the gentlewoman is recognized to explain her amendment.

Ms. BONAMICI. Thank you very much, Mr. Chairman.

Our nation has some of the best scientists, programmers, and engineers in the world, but what sets our country apart is innovation, the ability to come up with new ideas and find new ways to solve problems, and this is especially important in science, technology, engineering, and math.

Over the past several years, educators and employers have seen great benefits from integrating arts and design into STEM education, STEAM. STEAM engages more students and makes learning more relevant. Educating both halves of the brain results in more creative and innovative students who become members of a more creative and innovative work force.

And in opening remarks, Mr. Chairman, you mentioned looking at what other countries are doing. South Korea, for example, is implemented STEAM because they want more creative hands-on learning.

This bill is about improving STEM education, and I'm pleased to see that this bill would award competitive grants to community colleges to develop or improve associate degree and certificate programs in STEM fields in response to significant work force demand. This amendment would simply make sure that the National Science Foundation can also consider for grants those colleges or programs that are using the STEAM approach, which more schools and businesses are recognizing as a way to get creativity and inno-

vation in the STEM fields. There is neuroscience research to back them up. Integrating arts and design into STEM enhances learning and leads to more creativity. Think Leonardo da Vinci.

STEAM is not a partisan issue. I'm the Co-Chair of the bipartisan congressional STEAM Caucus with Representative Stefanik from New York. We've been working together to emphasize the importance of arts and design in the education of students in the development of our work force. When we had the STEAM Caucus kickoff, for example, the U.S. Patent Office attended. And in fact Governor Kasich of Ohio discussed his support for STEAM in his 2016 State of the State address mentioning that arts are essential for success in 21st century careers. And just recently, the U.S. Department of Education hosted—and Secretary DeVos attended—an event titled "Full Steam Ahead: Educational Summit on Science, Technology, Engineering, Arts, and Mathematics. The Nobel Laureates in sciences are significantly more likely to be engaged in arts and design than other scientists.

Mr. Chairman and colleagues, STEAM prepare students to be successful in the modern economy by teaching them the advanced skills and creative thinking they will need to address challenges in the future. So they will know not only how to answer questions but what questions to ask. Maintaining our position as an innovative country means continuing to fund groundbreaking research and educating a cutting-edge next-generation work force. I urge my colleagues to support this amendment, and I reserve the balance of my time.

Chairman SMITH. Thank you, Ms. Bonamici.

And I'll recognize myself to speak on the amendment. While I understand Ms. Bonamici's goals, I oppose the amendment. Many subjects correspond to or overlap with science, technology, engineering, and math, including art, music, and language. The inclusion of art in STEM, however, would dilute a national effort to build a robust technical work force, which remains an urgent national priority. In effect if art is included, where does it end?

So I oppose the amendment. I appreciate the gentlewoman's intentions and urge my colleagues to oppose the amendment as well.

Are there—is there anyone else who wishes to speak on the amendment?

Mr. ROHRABACHER. Mr. Chairman?

Chairman SMITH. The gentleman from California, Mr. Rohrabacher.

Mr. ROHRABACHER. I would just like to add a thought if we're discussing the education in STEM cell—or STEM education that is. Let me just note that there's some people who are claiming that we lack the number of people with skills in order to run our aerospace industry. And I just would like to express for the record that I am dismayed to meet so many people who are 50 years old and above or have some disability, people who are American citizens who are denied work because our major corporations are finding it better to try to lobby us to bring in people from overseas to take those jobs.

And I just believe that this whole H–1B visa situation is as—really hurting Americans who have contributed so much to our country. And when they get to be 50 and they're laid off because

the project contract is up and the company then has a new contract, they want to bring on a 25-year-old immigrant from India or anywhere else in the planet. And I would hope that we care enough about our people who are engaged in making America the technological and space power that we are so proud of, that we care about these men, and I just—men and women who are—deserve this.

And again, also people who have certain disabilities but can get the job done are passed over. And I've just seen this suffering in California, and a lot of these folks are veterans who also were in the military even, and they're just—we are not being true to them by bringing—by just saying we're going to solve the problem by bringing people in from overseas.

I think the idea that we've got to focus on education for our own people is a good fundamental idea, and I hope that we will find ways of working on this in a way that you will be able to support that, Mr. Chairman, as well as our——

Chairman SMITH. OK.

Mr. ROHRABACHER [continuing]. Colleagues on the other side of the aisle. I just thought I'd put that in the record. Thank you very much.

Chairman SMITH. Thank you, Mr. Rohrabacher.

Is there anyone else who seeks to be recognized?

Although the gentlewoman from Oregon has already been recognized, we will recognize her without objection again.

Ms. BONAMICI. Thank you, Mr. Chairman. And I understand you do not support this amendment at this time. I hope to continue the conversation. I know I didn't mention that we had a STEAM Caucus briefing with Boeing, Intel, and Lockheed Martin, all talking about how they value creativity and innovation. So I hope we can find a way to work together to promote a well-rounded work force that's ready to meet the demands of our growing economy in the future, and I thank the Chairman and with that ask that my amendment be withdrawn. And I yield back.

Chairman SMITH. Without objection, so ordered and appreciated.

The gentlewoman is recognized for her second amendment.

Ms. BONAMICI. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. Without objection, the amendment will be considered as read.

The CLERK. Amendment to H.R. 5509 offered by Ms. Bonamici of Oregon, amendment number 071.

Chairman SMITH. I spoke out of order. I should've said that the amendment should be reported. Without objection, the amendment will be considered, and the gentlewoman from Oregon is recognized to explain this amendment.

Ms. BONAMICI. Thank you, Mr. Chairman.

I hear from many Oregonians, and I know you hear from your constituents as well, who feel left behind and left out of the economic recovery. Too many people are still struggling to make ends meet. There may be job openings in their community, but the jobs require skills and resources they don't have, creating a skills gap that leaves businesses struggling to find workers with the skills and workers without pathways to better-paying jobs. We need to

strengthen investments in work-based learning programs that respond to local industry needs.

For example, in northwest Oregon, the Oregon Manufacturing Innovations Center, or OMIC, is bringing together industry leaders like Boeing with educational institutions such as Oregon Tech, Oregon State University, Portland State University, and Portland Community College to develop work-based learning programs. This collaboration will result in growth and efficiency in advanced manufacturing and a more skilled workplace—workforce in the community. Through stronger investments and work-based learning, we can build pathways to get more people back to work and provide our Nation's businesses with the work force that will improve productivity and efficiency.

To help Oregonians and many other Americans who still face job insecurity, we should expand work-based learning to sectors of the economy that lack established apprenticeship programs including in the STEM fields or STEAM fields. One way to support these new apprenticeships is through the establishment of industry partnerships which bring together employers, education institutions, training providers, and community-based organizations to support the creation and expansion of work-based learning programs.

I'm glad this bill will direct the National Science Foundation to provide grants to universities to develop or improve apprenticeships for students enrolled in STEM fields where there is significant work force demand. My amendment would allow universities or community colleges to engage with industry and sector partnerships in the grant application process. Industry partnerships have proven to be a successful model since the enactment of the *Workforce Innovation and Opportunity Act* and can help employers that would otherwise lack the resources to establish apprenticeships. The inclusion of industry partnerships in this bill would encourage continuity in State and local strategies to address skills shortages.

I urge colleagues to support this amendment, and I yield back the balance of my time.

Chairman SMITH. Thank you, Ms. Bonamici. And I'll recognize myself in support of the amendment. First of all, I want to thank Ms. Bonamici and her staff for working with us on this amendment. The competitive grants in this bill are intended to spur innovative research through STEM partnerships between academia and industry. This amendment reinforces the desire to provide NSF with the flexibility needed to fund strong partnerships between local and regional employers and academia to experiment with applied learning opportunities. So I support the amendment and encourage my colleagues to do the same.

Are there any other Members who wish to be recognized on this amendment?

The gentlewoman, the Ranking Member, Ms. Johnson is recognized and then Mr. Lipinski.

Ms. JOHNSON. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. I want to thank Ms. Bonamici for offering this amendment to expand the potential pool of partners in developing apprenticeship programs to include industry or sector partnerships.

By incorporating the structure established in the *Workforce Innovation and Opportunity Act*, this amendment provides clarity to grant proposers collaborating with local and State work force development boards, and I urge my colleagues to support this amendment. I thank you and yield back.

Chairman SMITH. Thank you, Ms. Johnson.

The gentleman from Illinois, Mr. Lipinski, is recognized.

Mr. LIPINSKI. Thank you, Mr. Chairman.

I want to thank Ms. Bonamici for her amendment to help strengthen this important bill, and I'm proud to cosponsor this bill. It's very important that we do more to promote the development of our STEM technical work force. And the program at the NSF to help do this has been very important, and it's very good that we make sure we prioritize this moving forward.

I'm an ardent supporter of STEM education with two degrees I have in engineering. I've also been a very strong supporter of apprenticeships. We need to see expansion of apprenticeships in our work force to really help to teach the skills that are required for today's jobs.

A recent hearing in this Committee, we heard testimony from a witness from Moraine Valley Community College, which is in my district, and Moraine Valley runs a program that prepares students for careers in cybersecurity, something that would—this bill would help to do and to help expand such programs.

I think it's very important that—for the jobs that are out there today that we need more skilled employees for that. Apprenticeships certainly help significantly. And I think this program at the NSF which would help strengthen the STEM technical work force is going to be very significant.

I would like to have seen an increase in funding for this program which this bill does not provide, but this bill is a step in the right direction. I want to thank our Representatives Smith and Marshall for their work on this bill, and I urge all my colleagues to support it.

And I'll yield to Mr. Perlmutter.

Mr. PERLMUTTER. And thank you, Mr. Lipinski. You'll have the opportunity on the next bill for STEM education grants to add $8 million, so I just want to let you know that we're going to authorize hopefully $8 million for STEM grants out of the space program. And with that, I yield back.

Mr. LIPINSKI. And reclaiming my time, great idea, Mr. Perlmutter, and will support that. I'll yield back.

Chairman SMITH. Thank you, Mr. Lipinski. A little advance advertisement by Mr. Perlmutter.

Is there any further discussion on the amendment?

If not, the question is on agreeing to the amendment.

All in favor, say aye.

All opposed, nay.

The amendment is agreed to.

If there is no—if there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5509 to the House, as amended, with a recommendation that the bill be approved.

Question is on favorably reporting H.R. 5509 to the House, as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 5509 is ordered reported to the House. I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes, and without objection, so ordered.

Let me say to Members that there are ongoing negotiations on the NASA bill, and in order to conclude those discussions, we're going to take a 5-minute recess and then we will reconvene. So if Members will stay really close by—in fact, you don't need to leave your seats at all. But we'll be back with a NASA bill in about 5 minutes.

[Recess.]

Chairman SMITH. Let me just say to my colleagues that we are still waiting to hear from the minority as to what their final response is going to be, and we have told them that we expect to reconvey at 11 o'clock, so our 5 minutes is going to 15. But we hope to start again at 11.

Mr. ROHRABACHER. Mr. Chairman, now that you have—we have a little extra time, I wonder if you have some stories about the great State of Texas that you could share with us.

Mr. WEBER. Dana, I've got one for you if you want one.

Chairman SMITH. OK. The gentleman from Texas is recognized, but I'm a little worried as the——

Mr. WEBER. Dana, Texas is so big that it was said that back during the covered-wagon days when the pioneers were coming West, if one entered Texas from Louisiana and a baby was born on that day, by the time they got to El Paso, he was in the first grade.

[Recess.]

H.R. 5503

Chairman SMITH. Pursuant to notice, I now call up H.R. 5503, the *National Aeronautics and Space Administration Authorization Act of 2018*. The clerk will report the bill.

The CLERK. H.R. 5503, to authorize the programs of the National Aeronautics and Space Administration for fiscal years 2018 and 2019 and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point. And I'll recognize myself for an opening statement.

The *NASA Authorization Act of 2018* is a crucial step in continuing the greatness of American space exploration. The act ensures that NASA will focus on its priority missions, leverage private sector partnerships and entrepreneurship, and continue space research that will launch America toward new scientific discoveries and worlds. NASA's funding amounts to $20.74 billion or 1/2 of 1 percent of the Federal budget.

Consistent with the core policy tenants of the President's budget request, the *2018 NASA Authorization Act* maintains a balanced portfolio across a broad array of NASA priority programs and ini-

tiatives. It funds deep space exploration systems above the President's request to expedite the Space Launch System and Orion Spacecraft. It funds science above the President's budget request to allow NASA to move forward with a number of programs, including a Mars sample return mission and Europa exploration.

The Committee has ongoing concerns that NASA has been given responsibility for earth science activities that compete for funding with NASA's core functions in space exploration and aeronautics. A good example is Landsat. In the past, both United States Geological Survey and NOAA have been responsible for development and operation of Landsat satellites. But now, NASA is responsible for mission and development activities, including Landsat 9, along with an activity to design and build a full-capability Landsat 10 satellite.

In the omnibus appropriation bill, 11 of the 12 other agencies conducting earth science research received budget increases, such as NOAA, DOE, United States Geological Survey, Agriculture, EPA, NSF, the Smithsonian, DOT, HHS, DOD, and even the United States Agency for International Development. However, NASA has, for too long, conducted earth science work for the benefit of other agencies without reimbursement.

To make certain NASA's funding authorization is truly focused on space exploration and aeronautics, this act aligns funding accordingly and directs reimbursement to NASA for earth science work undertaken for the benefit of other agencies. This reimbursement directive serves to offset NASA funding reductions in earth science relative to the President's budget request. However, earth science still receives $1.45 billion, or 7 percent of NASA's entire budget. The act supports the President's proposal to restructure and increase funding for NASA's space technology programs to better align to NASA human and robotic exploration needs. This is a good step forward for NASA.

As a critical component to NASA's exploration agenda, for too long, space technology investments lacked the focus and attention they deserve. The act includes a number of provisions increasing transparency into NASA's management of major programs and ensuring that contractors are held responsible for poor performance.

Just 3 weeks ago, Congress was notified that the James Webb Space Telescope is delayed yet again. In fact, it has been delayed no less than three times, originally scheduled for launch in 2007, then 2014, then 2018, and now for 2020. And the cost has increased from $1 billion to $8 billion. While this Committee supports JWST, NASA and its contractors must be held accountable.

The Committee looks forward to the Independent Review Board's report this summer, which will determine the revised cost estimate for the program and help define a way forward for this space telescope program.

That brings me to the Wide Field Infrared Space Telescope, WFIRST. This Committee has consistently supported it, but the recent cost growth and independent review team findings are similar to problems incurred on JWST. The act strikes a balance, capping spending if WFIRST moves forward and providing a set-aside in Fiscal Year 2019 of $180 million to address justified recommendations of the JWST and WFIRST program reviews that are pending.

We have explored near-Earth object defense at Committee hearings. The Administration prioritized this mission and requested $150 million for NASA's Planetary Defense program. NASA must complete its NEO survey. Supporting projects such as the NEOCam mission could go a long way to accomplishing this task.

Testimony before this Committee has also highlighted that we are on the verge of a breakthrough in the search for life that could change the way humanity views its place in the universe. In the *2017 NASA Transition Authorization Act*, NASA was given a new statutory directive for NASA to, quote, "search for life's origin, evolution, distribution, and future in the universe." This act directs and authorizes funds to achieve that purpose.

It was my hope that today we would have a bipartisan markup. In fact, discussions have been ongoing for weeks and a draft bill text was exchanged 3 weeks ago. An offer was made, and rejected, to fund earth science at the NASA-requested or omnibus levels, though I expect that to continue to be discussed shortly.

The United States has led the world in space exploration for 50 years, and we must ensure that the United States continues to do so for the next 50 years. We must also continue to invest in NASA as the only American agency responsible for space exploration.

I want to thank Chairman Babin for introducing this bill. It redoubles our commitment to U.S. leadership in space for decades to come.

PREPARED STATEMENT OF CHAIRMAN SMITH

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I thank Chairman Babin for introducing this bill. It redoubles our commitment to U.S. leadership in space for decades to come.

Before I close, I want to thank the committee staff who have devoted so much time and effort for months, including this past weekend - I know we were all there on Sunday, for example, and Saturday - to negotiate and perfect this bill. They are Mike Mineiro, Ryan Faith, Sam Amber, Sara Ratliff, Molly Fromm, Tom Connally, and recently departed for active Naval duty, Tom Hammond, as well as Chairman Babin's staffer Steve Janushkowsky. Thank you all.

I strongly recommend this bill and urge my colleagues to actively support it.

Chairman SMITH. I'll now recognize the Ranking Member, the gentlewoman from Texas, Ms. Johnson, for her opening statement.

Oh, and before I close, I'd like to add one more thing. Excuse me, Ms. Johnson. I want to thank the Committee staff who have devoted so much time and effort for months, including this past weekend—I know we were all there on Sunday, for example, and Saturday—to negotiate a perfect—this bill. They are Mike Mineiro, Ryan Faith, Sam Amber, Sara Ratliff, Molly Fromm, Tom Connally, and the recently departed for active Naval duty, Tom Hammond, as well as Chairman Babin's staff Steve Janushkowsky. Thank you all for the long-time effort, for the many hours, and for working over this last weekend.

I strongly support the bill and I urge my colleagues to support it as well. And that concludes my opening statement, and the Ranking Member is recognized for hers.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

Unlike the last bill we considered, this bill, H.R. 5503, is deeply flawed, and the process that got us to this moment was just as flawed, as I will explain. First, this bill slashes funding for earth science by a half-billion dollars in Fiscal Year 2019, a quarter of the total earth science budget. These cuts are simply another manifestation of the majority's continued war on climate science.

However, these reckless cuts are so deep that they will likely threaten more than just climate science at NASA. The earth science budget supports numerous programs that help Americans from aiding farmers to saving American lives and natural disaster response, and all of us must know what natural disaster has been like recently.

Where all of this money—where does all of this money go? The majority diverts it to searching for space aliens and to the President's unexamined initiative to build an orbiting moon base, among other things. I really wish this was a joke. The majority slashes funding for programs that help humans here on earth and instead prioritizes spending money to find space aliens.

Let me be clear. I think the search for life in the universe is a fascinating quest, and I'm also a strong supporter of exploration, but I think melting ice caps, rising sea levels, the increases in extreme weather events and droughts, and the other serious manifestations of climate change here on earth are also things we should be concerned about and studying.

I don't have time today to discuss all the issues with this bill because there really are many. I would just note that the bill endorses President Trump's exploration priorities and plans without the Committee having had a single hearing to review it. It directs NASA to follow the ISS transition plan before Committee Members have even had any opportunity to review it in depth or hear from stakeholders. I could go on with other examples, but I think you get the point.

As problematic as the substance of this bill is, the process that brought us here today is just as problematic. The majority's staff began discussing this legislation with minority a couple of weeks ago. They first provided minority staff with an early draft 2 weeks ago.

A significantly different version was provided to the minority on April the 12th. It came with an ultimatum. In essence, if I didn't agree to support the bill as written, then the Chairman would notice the markup on April the 13th with a very different punitive version of the bill. And that's what's happened, just as Members were leaving town for the weekend. I really don't think vindictiveness is a good basis for legislating.

I also don't think it is very effective in the long run. I don't think it is very effective, especially for professionals that have the confidence of the public to look out for their common good. But the reality is we are now marking up a partisan bill that has been rushed to markup with childish ultimatums and arbitrary deadlines in the process, disenfranchising Members on both sides of the aisle from being able to conduct the oversight in hearings that one of our Committee's most significant agencies warrant. There is no

way to legislate for an agency that accounts for fully 1/2 of the total dollars that our Committee authorizes.

It has needlessly injected partisanship in our Nation's space program yet again. That doesn't help NASA, nor does it help us. Instead, it ultimately winds up weakening the widespread bipartisan support NASA has traditionally enjoyed, and it certainly diminishes the standing of this Committee.

I yield back.

PREPARED STATEMENT OF MS. JOHNSON

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Chairman SMITH. Thank you, Ms. Johnson. I'm going to recognize myself for a minute to respond and—so that all Members know at least how I see the process.

For several weeks going back to mid-March long before a draft bill was complete, my staff had been in discussion with their minority counterparts regarding the NASA authorization markup.

Text was formally transmitted to minority staff on Monday, April 2. On April 3 and April 4, 2 weeks ago, majority staff met with their minority counterparts for more than 5 hours to walk through the bill and answer questions. Indeed, several suggestions made during these discussions with minority staff were incorporated into the bill.

Originally, this markup was scheduled for April 12, and majority and minority staff were working toward this date. The decision was made to postpone the markup to today, April 17, in order to allow staff more time to work on the bill at the minority' request.

On April 11, a formal offer was made for a bipartisan bill with higher levels for the earth science account. On April 12, the most up-to-date version to the policy provisions of the bill were transmitted to minority staff literally within seconds after we received it. Majority staff offered to discuss the bill and the offer at the minority's convenience. The offer was never accepted.

The majority staff in my view has acted in good faith and been in discussions of the bill with the minority on a regular basis for weeks.

I'll now recognize the gentleman from Texas, the Chairman of the Space Subcommittee, Mr. Brian Babin.

Mr. BABIN. Thank you, Mr. Chairman. It's an honor and a privilege to bring the NASA 2018 authorization to this Committee today.

Just over a year ago, the *2017 National Transition Authorization Act* was signed into law, representing a clear bipartisan commitment to our Nation's space program. That law established and this bill continues to honor three very important provisions: Continuity of purpose, clear long-term goals for exploration, and a balanced space science portfolio. NASA must stay the course on future exploration while preserving our advancements in low Earth orbit.

The first urgent question is the future of the International Space Station. The ISS is the jewel in the crown of America's space program. As a representative of the hardworking men and women of Johnson Space Center, I know how important the ISS is to our Nation.

The Administration, in response to congressional direction in 2017, has provided a proposal for ISS transition. It is too early to say how or when the transition will occur, but the recent report outlines a credible course of action and early initial steps. I support the Administration carrying out these first steps, but it is critically important that we see a more detailed plan before steps are taken to sunset the ISS.

The bill directs NASA to continue the operation of the ISS for such time as Congress authorizes. It prevents the Administration from pursuing any international agreements that would tie the hands of future Congresses. The Administrator must report directly to this Committee every 3 months on the status of the ISS transition. In other words, the ISS must be transitioned but not before we as a nation are ready to do so.

This bill provides funding for the SLS and Orion programs at omnibus levels, signaling that we will support the programs as they move toward realization. It also explicitly authorizes and di-

rects the development of a second mobile launch platform to increase safety, reduce delays, and provide flexibility for exploration.

These and other measures provide a strong foundation, fostering a whole-of-government, indeed, a whole-of-nation approach to space. As Vice President Pence said yesterday, space exploration is essential to our national security, it's essential to our Nation's prosperity, and it is essential to the very character of America.

I have and continue to support the idea of a balanced space program. We must also understand that balanced means not only balanced within NASA but also balanced across government.

Within the proposed authorization levels, NASA's science portfolio is 30 percent of NASA's budget. This is consistent with both the omnibus and the President's budget request. In planetary science, this bill increases spending from the kind of science that only NASA can do and for which NASA is the first and perhaps the only customer such as Mars sample return and missions to Europa. In a responsible way, earth science is correspondingly reduced.

The Administration is directed to provide NASA reimbursement for work undertaken for the benefit of other agencies such as the development of particular earth science systems. This will allow NASA—continuing working on missions like Landsat without undermining its exploration mission.

NASA fills an essential and irreplaceable role for our country. It is the only agency to send humans to the surface of another celestial body, to send spacecraft to every planet in the solar system, and to send probes into interstellar space.

I want to thank Chairman Smith for his leadership and guidance in reaffirming our national commitment to the exploration and use of space. I strongly recommend this bill and urge my colleagues to actively support it.

PREPARED STATEMENT OF MR. BABIN

It is an honor and a privilege to bring the NASA 2018 Authorization to this committee today.

Just over a year ago, the *2017 NASA Transition Authorization Act* was signed into law, representing a clear bipartisan commitment to our nation's space program. That law established and this bill continues to honor three very important provisions: Continuity of purpose, clear long-term goals for exploration and a balanced space science portfolio. NASA must stay the course on future exploration while preserving our advancements in low-Earth orbit.

The first urgent question is the future of the International Space Station (ISS). The ISS is the jewel in the crown of America's space program. As a representative of the hard working men and women of Johnson Space Center, I know how important the ISS is to our nation.

The administration, in response to congressional direction in 2017, has provided a proposal for ISS transition. It is too early to say how or when the transition will occur but the recent report outlines a credible course of action and early initial steps. I support the administration in carrying out first steps. I support the administration carrying out these first steps but it is critically important that we see a more detailed plan before steps are taken to sunset ISS.

The bill directs NASA to continue the operation of the ISS for such time as Congress authorizes. It prevents the administration from pursuing any international agreements that would tie the hands of a future Congress. The administrator must report directly to this committee every three months on the status of the ISS transition. In other words, the ISS must be transitioned, but not before we, as a nation, are ready to do so.

This bill provides funding for the SLS and Orion programs at omnibus levels, signaling that we will support the programs as they move towards realization. It also

explicitly authorizes and directs development of a second mobile launch platform to increase safety, reduce delays and provide flexibility for exploration.

These and other measures provide a strong foundation, fostering a whole-ofgovernment, indeed, whole-of-nation approach to space. As Vice President Pence said yesterday: "Space exploration is essential to our national security, it's essential to our nation's prosperity, and it is essential to the very character of America."

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Within the proposed authorization levels, NASA's science portfolio is 30 percent of NASA's budget. This is consistent with both the omnibus and the president's budget request.

In Planetary Science, this bill increases spending for the kind of science that only NASA can do and for which NASA is the first, and perhaps only, customer, such as Mars Sample Return and missions to Europa.

In a responsible way, Earth science is correspondingly reduced. The administration is directed to provide NASA reimbursement for work undertaken for the benefit of other agencies, such as the development of particular Earth science systems. This will allow NASA to continuing working on missions like Landsat without undermining its exploration mission.

NASA fills an essential and irreplaceable role for our country. It is the only agency to send humans to the surface of another celestial body, to send spacecraft to every planet in the solar system and to send probes to interstellar space.

I thank Chairman Smith for his leadership and guidance in reaffirming our national commitment to the exploration and use of space.

I strongly recommend this bill and urge my colleagues to actively support it.

Before I yield back to the Chairman, without of objection, I'd like to place the following letters and statements of support in the record, from a number of organizations including:

- Aerospace Industries Association
- American Society for Gravitational and Space Research
- Association of Universities for Research in Astronomy
- Astrobotic
- Bay Area Houston Economic Partnership
- Boeing
- Commercial Spaceflight Federation
- Made in Space
- Moon Express
- Nanoracks
- National Space Grant Alliance
- Texas A&M University System
- Vector Space Systems
- Virginia Commercial Spaceflight Authority
- Space Florida

Mr. BABIN. And before I yield back to the Chairman, without an objection, I'd like to place the following letters and statements of support in the record from a number of organizations, including the Aerospace Industries Association, American Society for Gravitational and Space Research, Association of Universities for Research and Astronomy, Astrobotic, Bay Area Houston Economic Partnership, Boeing, Commercial Spaceflight Federation, Made in Space, Moon Express, NanoRacks, National Space Grant Alliance, Texas A&M University System, Vector Space Systems, Virginia Commercial Spaceflight Authority, and Space Florida. I request to enter these 15 letters and statements into the record without objection.

Chairman SMITH. Without objection, that list of individuals, organizations, companies, and stakeholders who endorse the bill will be made a part of the record.

April 16, 2018

AIA Welcomes NASA Authorization Bill

Arlington, Va. — The Aerospace Industries Association welcomes the introduction of the National Aeronautics and Space Administration (NASA) Act of 2018. The bill authorizes NASA operations through Fiscal Year 2019 (FY19) and provides important policy direction for America's space endeavors, allowing government and industry to engage in the longer-term planning necessary to realize our vision.

"NASA programs are truly inspirational, both for people working in our industry today and the rocket scientists and aerospace engineers of tomorrow," said AIA President and CEO Eric Fanning. "It's an exciting time of growth and change in the space community and we are encouraged by the national attention that space is receiving."

NASA programs supporting civil, commercial and national security applications are at the center of American achievement and innovation and support tens of thousands of high-paying jobs in the space industrial base. The NASA authorization bill demonstrates Congress' continued commitment to U.S. leadership and superiority in space through FY19.

"Space plays a vital role in U.S. national security and economic prosperity," Fanning added. "We are interested in learning more about Congress' priorities for NASA through tomorrow's full Science Committee mark-up of the bill and to working with the House and Senate to ensure its eventual passage."

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CONTACT: Dan Stohr
(703) 358-1078 office
(703) 517-8173 mobile
dan.stohr@aia-aerospace.org

American Society for Gravitational and Space Research

Biology and Physical Sciences Bridging Earth and Space

www.asgsr.org

April 16, 2018

Chairman Lamar Smith
House Science Committee
2321 Rayburn House Office Building
Washington, DC 20515

Ranking Member Eddie Bernice Johnson
House Science Committee
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Bernice Johnson:

The American Society for Gravitational and Space Research (ASGSR), founded in 1984, brings together a diverse group of scientists, engineers and students from academia, government and industry to promote microgravity research, education, training and development in the areas of space biology and physical sciences. The knowledge gained leads to a better understanding of the effects of gravity on living and physical systems on Earth and enables human space exploration.

The American Society for Gravitational and Space Research is writing in support of the proposed NASA re-authorization for FY18 and FY19. We are particularly supportive of statements in the bill that express support for microgravity research in the context of the International Space Station (ISS) mission Section 202 (a)(2). We also want to express support of the manager's amendment that inserts the following on page 10, after line 19

"(3) In addition to the priorities under paragraph (2), the United States has a larger and broader need and use for further microgravity research.

We also appreciate the recognition by the committee that the ISS transition is an evolving process and Congress will remain very engaged on the progress, changes and developments to carrying out the plans in the ISS transition report.

Thank you for your commitment and recognition of the need for microgravity research as part of a broader national research and innovation agenda.

Sincerely,

Cynthia Martin-Brennan
Executive Director

Anna-Lisa Paul, Ph.D.
President

Copies to: The Honorable Brian Babin
Chair, Space Subcommittee
United States House of Representatives

The Honorable Ami Bera,
Ranking Member, Space Subcommittee
United States House of Representatives

ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, INC.

AURA

Suite 1475
1331 Pennsylvania Avenue NW
Washington, DC 20004
TEL: 202-483-2101
FAX: 202-483-2106

OPERATING FOR THE
NATIONAL SCIENCE FOUNDATION

Gemini Observatory
La Serena, Chile & Hilo, Hawai'i

Large Synoptic Survey Telescope
Tucson, Arizona & La Serena, Chile

National Optical Astronomy Observatory
Tucson, Arizona & La Serena, Chile

National Solar Observatory
Boulder, Colorado & Maui, Hawai'i
Sunspot, New Mexico & Tucson, Arizona

OPERATING FOR THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Space Telescope Science Institute
Baltimore, Maryland

MEMBERS/SINCE:
Boston University 1993
California Institute of Technology 1972
Carnegie Institution of Washington 1997
Carnegie Mellon University 2017
Cornell University 2016
Fisk University 2010
Georgia State University 2008
Harvard University 1957
Indiana University 1957
Iowa State University 1992
Johns Hopkins University 1982
Kiepenheuer-Institut für Sonnenphysik 2016
Massachusetts Institute of Technology 1981
Michigan State University 1997
Montana State University 2005
New Jersey Institute of Technology 2010
New Mexico State University 1999
Ohio State University 1957
Pennsylvania State University 1990
Pontificia Universidad Católica de Chile 1997
Princeton University 1959
Rutgers University 1999
Smithsonian Astrophysical Observatory 2017
Stanford University 2012
Stony Brook University 1986
Swinburne University 2008
Texas A & M University 2014
Tohoku University 2010
Universidad de Chile 1992
University of Arizona 1972
University of California Berkeley 2007
University of California Santa Cruz 1957
University of Chicago 1957
University of Colorado 1977
University of Florida 2002
University of Hawaii 1978
University of Illinois 1980
University of Maryland 1986
University of Michigan 1957
University of Minnesota 1995
University of North Carolina at Chapel Hill 1995
University of Pittsburgh 2012
University of Texas at Austin 1972
University of Toledo 2016
University of Virginia 2003
University of Washington 1986
University of Wisconsin 1957
Vanderbilt University 2010
Yale University 1958

April 16, 2018

Hon. Lamar Smith
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith,

Thank you for the opportunity to comment on the 2018 and 2019 NASA re-authorization bill.

AURA is pleased to see that the Search for Life elsewhere in the Universe continues to be supported by the Committee as a NASA goal.

As you are no doubt aware, AURA priorities continue to be: robust support for the James Webb Space Telescope, especially for its operational phase after launch when the real science gets done; and successful completion of WFIRST with a coronagraph, crucial for detecting bio-signatures on planets around other stars.

We are happy to work with the Committee to ensure that NASA's search for life elsewhere is successful, and that NASA's astrophysics missions continue to create world-class science for the United States.

Sincerely,

Matt Mountain
AURA President

ASTROBOTIC

2515 Liberty Avenue
Pittsburgh, PA 15222
www.astrobotic.com
412-682-3282

4/16/2018

Dear Chairman Smith:

Thank you for your strong support for NASA's Lunar Science and Exploration programs in the NASA Authorization Act for FY 2018 and FY 2019, which is scheduled to be marked up this week. I was honored to testify before the Space Subcommittee last fall in support of NASA's lunar lander programs, and your authorization of these new programs within the Science Mission Directorate (SMD) and Advanced Exploration Systems (AES) will accelerate our nation's return to the surface of the Moon for the first time in nearly 50 years.

As you may know, a number of Republicans and Democrats in the House have advocated for these robotic lunar lander programs in both the FY 2018 and FY 2019 appropriations processes, which led to funding in tbe House FY 2018 Commerce-Justice-Science Appropriations Act. Your authorization provisions, along with the funding requested in the FY 2019 Presidents Budget Request, will continue to solidify this bipartisan support this year as the Appropriations Committee prepares its FY 2019 bill. Specifically, the strong funding authorized for the AES Advanced Cislunar and Surface Capabilities as well as the increased Planetary Science funding level that will support the Lunar science payloads and landers services in FY 2019 is a clear indication of your committee's support for these initiatives.

It is only fitting that this Authorization bill reasserts the need for NASA to support U.S. lunar lander capabilities as we approach the 50th anniversary of the Apollo 11 in FY 2019. Thank you for your leadership and support in this bill for NASA, industry and the science communities' efforts to restore American access to the lunar surface as quickly as possible.

Sincerely,

John Thornton

CEO, Astrobotic

BAY AREA HOUSTON
Economic Partnership

April 16, 2018

The Honorable Lamar Smith
Chairman, Committee on Science,
Space and Technology
2409 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member, Committee on Science,
Space and Technology
2468 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

The Bay Area Houston Economic Partnership supports the efforts of Congressman Babin to further America's human spaceflight program through the National Aeronautics and Space Administration Authorization Act of 2018. The Congressman has recognized the roles of the International Space Station in the development of NASA's deep space exploration program and in the development of commercial space. We support the continued NASA operation of the International Space Station beyond 2024 allowing for a sensible transition of operation to commercial entities, based on the development of capabilities by commercial operators. This approach to the utilization of the International Space Station will ensure America's continued leadership and presence in space.

Rep. Babin has also recognized the unique capabilities and expertise of the Johnson Space Center to lead the development of human operations beyond low earth orbit. We support the utilization of these capabilities to reestablish Johnson Space Center as the lead center for the development and integration of facilities, launch vehicles and equipment related to human space flight. The leadership and management of the Johnson Space Center will provide assurance for the safety and schedule for deep space exploration programs.

The Bay Area Houston Economic Partnership will continue to advocate NASA's human spaceflight program, driven by a desire to maintain America's leadership in space exploration. We encourage the efficient utilization of NASA's investments in the International Space Station, Commercial Crew and Resupply, the Space Launch System, Orion and NextSTEP.

Sincerely,

Bob Mitchell
President, Bay Area Houston Economic Partnership

P.O. Box 58724 | Houston | Texas 77258-8724
Voice: 832.536.3255 | Fax: 832.536.3258 | www.bayareahouston.com

BOEING

Tim Keating
Executive Vice President
Government Operations

The Boeing Company
929 Long Bridge Drive MC 7949-5929
Arlington, VA 22202-4208

April 16, 2018

House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Subcommittee Chairman Babin,

On behalf of The Boeing Company, I would like to express our support and appreciation for the House Science, Space, and Technology Committee's *NASA Authorization Act of 2018*. I also want to recognize your staff for working with stakeholders once the bill text was released to make additional improvements in the Manager's Amendment to ensure this bill fully reflects the Committee's commitment to our nation's deep space exploration and human spaceflight programs.

The bill reaffirms support and full funding for the Space Launch System and NASA's human exploration program, authorizes the Lunar Orbital Platform-Gateway to support crewed missions in deep space, supports continued development and operation of a safe and reliable Commercial Crew capability and reasserts support for the International Space Station, which is one of our Nation's most important research assets. It also supports a healthy aeronautics research directorate that contributes to our nation's aerospace economy.

Thank you again for your commitment to regular NASA reauthorization bills and we look forward to working with you and other members of Congress as this bill moves forward on the House floor.

Best regards,

Tim Keating

Tim Keating
Executive Vice President
Government Operations

727 15th Street NW, Suite 800
Washington, DC 20005
17 April 2018

Chairman Lamar Smith
House Science Committee
2321 Rayburn House Office Building
Washington, DC 20515

Ranking Member Eddie Bernice Johnson
House Science Committee
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

The Commercial Spaceflight Federation (CSF), representing over 80 member companies and organizations across the United States, is grateful for the time and energy you, your staff, and the other Members of the House Science, Space, & Technology Committee put into developing the *National Aeronautics and Space Administration Authorization Act of 2018.*

We appreciate the Committee's continued support and strong funding for the Commercial Crew and Commercial Cargo programs, recognizing their critical importance to continued ISS operations and, indeed, America's human spaceflight program. CSF Members also support the Committee's work regarding commercial low Earth orbit (LEO) activities, and critical path redundancy for operations beyond LEO, and public-private partnerships for lunar surface operations. We continue to believe that commercial solutions to deep space exploration are a critical advantage for the American space program.

We support the Committee's authorization of full funding for the Administration's proposal for increased commercial operations in LEO. The legislation recognizes the need for a national policy and strategy for microgravity research, the continuation of a National Laboratory during and beyond an ISS transition, the purchase of commercial supply of space products for space exploration missions, and support for Flight Opportunities program.

CSF and our members look forward to continuing to work with the Committee to encourage strong commercial space activity in America, Earth orbit, and beyond.

Sincerely,

Eric W. Stallmer
President
Commercial Spaceflight Federation

Government Affairs
2121 Crystal Drive Arlington, VA 22202
Telephone 703-413-5601

LOCKHEED MARTIN

Robert Rangel
Senior Vice President

April 18, 2018

Dr. Brian Babin (R-TX)
Chairman, House Subcommittee on Space
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Babin,

On behalf of Lockheed Martin, I would like to thank you and your staffs for your efforts on the NASA Authorization Act of 2018. Your work with stakeholders to make improvements through a Manager's Amendment aligns the bill with the Committee's commitment to our nation's deep space exploration and human spaceflight programs. This effort is very much appreciated.

We further appreciate the bill's reaffirmation of support and full funding for Orion, NASA's human exploration program, and the development of a lunar gateway.

Thank you for your commitment to regular NASA authorizations, and we look forward to working with you and other members of Congress on these common goals as this legislation moves forward.

Best regards,

Robert Rangel

Cc: Chairman Lamar Smith

April 16, 2018

The Honorable Lamar Smith
Chairman
House Science, Space, and Technology Committee

The Honorable Eddie Bernice Johnson
Ranking Member
House Science, Space, and Technology Committee

The Honorable Brian Babin
Chairman
Space Subcommittee

The Honorable Ami Bera
Ranking Member
Space Subcommittee

Dear Chairman Smith, Ranking Member Johnson, Chairman Babin, and Ranking Member Bera:

As the world's leading space-based manufacturer, Made In Space is a major user of the International Space Station (ISS) and its National Laboratory (NL). As such, we believe it is critically important that Congress develop and implement a plan to maximize the use and commercialization of the ISS and its NL, as well as a transition plan that ensures a seamless transfer of capabilities, including the NL, as the ISS reaches the end of its life. The National Aeronautics and Space Administration Authorization Act of 2018 helps accomplish these important goals, and Made In Space supports the bill.

The work that Made In Space is doing on the ISS directly supports several of NASA's priorities. Our 3D printers on the ISS have created many custom-designed objects for the crew. This capability supports NASA's human exploration mission by allowing on-demand manufacturing for long-duration space travel. Another of our manufacturing devices is also producing ZBLAN optical fiber, which can only be produced optimally in space, for sale on Earth. This capability advances NASA's Low Earth Orbit commercialization priority. Made In Space is also preparing to demonstrate the ability to 3D print and assemble large structures in the vacuum of space, which will allow NASA to build very large satellites, vehicles, and other objects without subjecting them to the rigors of the launch environment. Each of these programs benefits NASA, and each depends on an orderly ISS transition plan with a strong NL component.

As the bill moves forward, Made In Space hopes to work with the Committee to add language that specifically authorizes increases in funding for the ISS National Lab and increases funding for space-based demand activities, in order to more fully realize the goal of Low Earth Orbit commercialization.

Sincerely,

Andrew Rush
CEO
Made In Space

MOON EXPRESS

April 16, 2018

Chairman Lamar Smith
House Science Committee
2321 Rayburn House Office Building
Washington, DC 20515

Ranking Member Eddie Bernice Johnson
House Science Committee
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

Moon Express writes to express our support for H.R. 5503, the National Aeronautics and Space Administration Authorization Act of 2018.

We greatly appreciate the committee authorizing full funding for the two new lunar exploration programs proposed in NASA's 2019 Budget, the Lunar Discovery and Exploration Program within NASA's Science Mission Directorate and the Advanced Cislunar and Surface Capabilities program within NASA's Advanced Exploration Systems program. This combined Lunar Exploration Campaign will ensure that America leads in exploration of our nearest celestial neighbor.

The Lunar Discovery and Exploration Program (LDEP) will prepare NASA for future human landings and entrepreneurial activity by funding the development of scientific and technology payloads and their deployment to lunar orbit and the lunar surface. By leveraging commercial launchers, landers, and platforms, NASA will be able explore the Moon, including conducting the lunar science missions identified in the Planetary Science Decadal, far more quickly and cost-effectively than if the agency was planning a more traditional exploration strategy.

The Advanced Cislunar and Surface Capabilities program (ACSC) will develop commercial lunar lander capabilities for exploration and utilization of our nearest neighbor. The capabilities will support LDEP and enable the agency to undertake the Administration's planned series of lunar missions much more quickly and cost-effectively than if it was to develop such technologies in-house using traditional procurement methods.

Moon Express also applauds the committee for its foresight in including language which mandates that, to the greatest extent practicable, NASA prioritize acquisition of space products through commercial providers or through public-private partnerships with commercial providers. This language, if adopted, would set the stage for the continued

MOON EXPRESS

growth and expansion of the commercial space industry, and would incentivize further investments in innovation and the development of space capabilities that will benefit all Americans.

For these reasons, Moon Express requests that the committee approve H.R. 5503.

Sincerely,

Robert (Bob) Richards
Founder & CEO

April 17, 2018

The Honorable Lamar Smith
Chairman
U.S. House Committee on Science, Space
and Technology
2409 Rayburn House Office Building
Washington, DC 20515

The Honorable Brian Babin
Chairman
U.S. House Subcommittee on Space
316 Cannon House Office Building
Washington, DC 20515

Dear Chairman Smith and Chairman Babin:

I am writing to thank you for your ongoing efforts to strengthen the U.S. space industry and to express my support for the Fiscal Years 2018/2019 reauthorization legislation for the National Aeronautics and Space Administration (NASA).

We are faced today with differing challenges, whether external from other nations that are growing increasingly assertive in the space arena, and domestically as we seek to assure that America's leadership in space continues far into the future. Meeting these challenges requires innovation to further assure a robust U.S. capacity to maximize utilization of the space arena.

NanoRacks is the leading commercial provider of goods and services to the International Space Station, and other in-space platforms, where the government serves as a commercial customer. We look forward to

NanoRacks LLC
555 Forge River Road, Suite 120
Webster, TX, 77598

NANORACKS

continuing and expanding our ongoing work with NASA to most cost-efficiently introduce new technologies and systems to meet an increasingly challenging environment.

We are fortunate as a country to have leaders such as you who understand the challenges we face and are willing to act to improve American competitiveness in space. I am particularly pleased with the inclusion in your legislation of the recently proposed Commercial LEO Development program with a focus on enabling, developing and deploying multiple commercial orbital platforms and authorizing $150,000,000 for these purposes in Fiscal Year 2019.

Thank you in advance for your consideration of my strong support for the Fiscal Years 2018/2019 NASA reauthorization measure. I am pleased to provide any additional information which may be helpful and I look forward to working with you and your staff to improve this important bill as it moves through the legislative process.

Sincerely,

Jeffrey Manber
Chief Executive Officer

NanoRacks LLC
555 Forge River Road, Suite 120
Webster, TX, 77598

NSGA
National Space Grant Alliance

April 17, 2018

Hon. Lamar Smith
Chair
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith,

On behalf of the National Space Grant Alliance, I want to thank the Chairman for including a reauthorization of the National Space Grant College and Fellowship Program in H.R. 5503, the NASA Reauthorization Bill for 2018 and 2019. We would also like to state our support as well for the reauthorization of NASA's Office of Education and the broad programs that are funded through that office.

Space Grant is a competitive, state-federal partnership that functions through consortia in all 50 states, Puerto Rico, Guam, the Virgin Islands, and the District of Columbia. The program enables students to engage in outreach activities and research projects that prepare them for STEM careers. Space Grant consortia are effective catalysts in each state to help grow a high-tech workforce. With over 800 partner institutions, this program promotes aerospace and other NASA relevant STEM education activities, and helps sustain a pipeline of students for innovative, high-tech jobs. For every dollar that NASA provides, Space Grant consortia contribute on average an equal or greater amount from non-federal sources to maximize resources available to students in their states. Because this is a federal-state partnership, the Space Grant program not only addresses national needs, but has proven to be very effective at fulfilling state and regional STEM goals—NASA program data shows that, of all participating students graduating in a particular year, over 80% move on to either a STEM job in industry, NASA, academia, or they enroll in a STEM graduate program.

Thank you again for your leadership in supporting NASA's Office of Education and the Space Grant Program. We look forward to working with you and the committee to ensure that STEM education continues to be a priority for our nation.

Sincerely,

John B. Kosmatka, Ph.D., P.E
Chair, National Space Grant Alliance
Director, California Space Grant Consortium
Professor and Callaway Golf Chair of Structural Mechanics
University of California, San Diego
e-mail: jkosmatka@ucsd.edu Phone: (858) 534-1779

CO-FOUNDERS: Carl Sagan 1934–1996 Bruce Murray 1931–2013 Louis D. Friedman Executive Director Emeritus

60 S. Los Robles Avenue
Pasadena, CA 91101-2016 USA

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planetary.org

The Honorable Lamar Smith
2409 Rayburn House Office Building
Washington, DC 20515

The Honorable Eddie Bernice Johnson
2468 Rayburn Office Building
Washington, DC 20515

Chairman Smith and Ranking Member Johnson,

The Planetary Society is pleased to see the House Science Committee advance H.R. 5503 as amended, and is particularly supportive of its recommendation for a critical funding increase to planetary science while maintaining overall balance in the science mission directorate and NASA writ large.

The Planetary Science Division is in a period of rebuilding, and the $2.6 billion authorization would be a critical step in maintaining U.S. leadership in space science and exploration in the next decade.

Planetary defense is a high priority for The Planetary Society. Congress has consistently taken the lead on this topic since the 1990s by directing NASA to pursue NEO detection and classification, and this bill continues that legacy. The Society supports the language endorsing NEOCam or a similar space-based near earth object (NEO) detection capability.

The Society is also very pleased to see that Mars remains a top destination for human spaceflight goals, and that NASA will be directed to prioritize human exploration beyond low-Earth orbit. The Society also supports the language that advances the important debate regarding the future of the International Space Station, and how NASA can find ways to reduce costs in order to pursue human exploration beyond Earth.

We commend the committee for working in a bipartisan manner during the markup process to support all of space science and exploration at NASA, and its efforts to forge a consensus path forward for the nation's space program.

Sincerely,

Casey Dreier
Director of Space Policy
The Planetary Society

Bill Nye
Chief Executive Officer

Jennifer Vaughn
Chief Operating Officer

BOARD OF DIRECTORS

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SPACE FLORIDA

April 17, 2018

Chairman Lamar Smith
House Science Committee
2321 Rayburn House Office Building
Washington, DC 20515

Ranking Member Eddie Bernice Johnson
House Science Committee
394 Ford House Office Building
Washington, DC 20515

Dear Chairman Smith and Ranking Member Johnson,

Space Florida applauds the work that the House Science, Space, & Technology Committee put into developing the National Aeronautics and Space Administration Authorization Act of 2018.

As the State of Florida's aerospace authority, Space Florida fosters bold economic development activities to expand and diversify domestic and international opportunities that support talent development and enhance infrastructure in the support of expanding human activity in space. The State of Florida has successfully financed, invested in, and effectively integrated close to $1B in infrastructure investments at the Cape Canaveral Spaceport, particularly in support of the burgeoning commercial sector. Many of these projects involve structural upgrades to operations and management of existing U.S. government facilities. In particular, Space Florida is able to provide matching dollars to certain funds in the NASA budget, thereby leveraging federal taxpayer investment in Cape Canaveral Spaceport infrastructure. We look forward to working with the agency and particularly Kennedy Space Center to accomplish that objective.

Space Florida is glad to see the House taking a strong leadership approach to providing direction to NASA. We are very appreciative of the opportunity to provide input in the process and look forward to continuing to work with the Committee to support the growth of a world-class space economy in Florida that maintains and strengthens our country's leadership in space.

Sincerely,

Frank A. DiBello
President and CEO
Space Florida

505 ODYSSEY WAY, SUITE 300, EXPLORATION PARK, FL 32953
T 321.730.5301 • SPACEFLORIDA.GOV

Office of the Chancellor
THE TEXAS A&M UNIVERSITY SYSTEM

April 17, 2018

The Honorable Lamar Smith
Chair
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith:

Thank you for your leadership in bringing H.R. 5503, the NASA Reauthorization Bill for 2018 and 2019, before the full committee for deliberation. The bill's record high authorization numbers in critical areas such as science, aeronautics, and human exploration are a testament to the committee's desire to keep our nation at the forefront of technology and innovation for the future.

As the Chairman well knows, Texas is a leader in space exploration. From human spaceflight to aeronautics, our state boasts strong industries and universities committed to near and long-term solutions to challenging problems. The Texas A&M University System is proud to have world-renowned expertise in human spaceflight research, hypersonics, and unmanned aerial vehicles. Indeed, Texas A&M has been actively involved with human spaceflight research from robotics, to human performance to agriculture. Further, Texas A&M is home to one of five NASA university leadership initiatives where we are performing research to design commercial supersonic aircraft that can modify their shape during a flight to help minimize noise from sonic booms. Texas A&M – Corpus Christi hosts one of the six FAA unmanned aircraft system (UAS) test sites and has been working with NASA on UAS research for many years. We are pleased that the committee recognizes the importance of these areas by prioritizing research in human space exploration, increasing the aeronautics budget, including $30 million for hypersonics research, and authorizing programs in UAS research.

Texas A&M is also a Space Grant College, and we are committed to training the next generation of students for careers in the growing aerospace field. We appreciate that the committee funds the NASA Education account at $100 million and includes full funding for the Space Grant program. Keeping this state-based program funded is important to ensuring that all students nationwide have access to quality STEM initiatives and are prepared for the jobs of tomorrow.

301 Tarrow Street, 7th Floor · College Station, Texas 77840-7896
(979) 458-6000 · Fax (979) 458-6044 · www.tamus.edu

Thank you again for keeping our space program as a top priority for the committee and Congress. It is critical that we continue to support the agency, as well as commercial ventures, to keep our state and nation in the lead worldwide.

,

John Sharp
Chancellor

cc: Mr. Scott Sudduth, Esq.
Associate Vice Chancellor and Director, Federal Relations

ROBBIE SABATHIER
Vice President, Washington Operations
and Communications

April 23, 2018

House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Smith and Subcommittee Chairman Babin,

On behalf of United Launch Alliance, I would like to congratulate you and your staff for your work on the *NASA Authorization Act of 2018*. In particular, I want to thank you for working with stakeholders after the bill's release to construct a Manager's Amendment with meaningful inputs that helped further improve the bill.

We commend the Committee for its strong support of human exploration, and robust funding authority for the Space Launch System (SLS), Orion Multipurpose Crew Vehicle, commercial crew, and commercial cargo programs. We also appreciate your support of a second Mobile Launch Platform and Interim Cryogenic Propulsion Stage which enable the busy manifest for the SLS and Orion systems. In addition, your efforts help strengthen America's space industrial base and take the first steps in establishing how the government and commercial sector will work together to establish a CisLunar economy, and what a legal regime to govern such an economy will look like.

We are at a critical juncture in our nation's space program. As we prepare to launch some of the most advanced spacecraft ever built, launch the world's most powerful rocket carrying the capsule that will take humans to the Moon, Mars, and beyond, and launch American astronauts from American soil once again, it is vital that Congress and the Administration work together to ensure our nation stays the course. Together, we will ensure the United States remains the leading nation in space. Thank you for your leadership; we look forward to working with you and your colleagues as this bill advances.

Sincerely,

Robbie Sabathier

ULA™
United Launch Alliance
1300 Wilson Blvd., Suite 950
Arlington, VA 22209

Sent: Tuesday, April 17, 2018 9:33 AM
Subject: Vector Space

"On behalf of Vector Launch, part of emerging multi-billion dollar commercial space industry, we very much support the NASA Authorization bill that, among other innovative initiatives, strongly encourages NASA to rely on commercial services & products in order to reduce the bill for the American taxpayer, refocus on its core R&D capabilities while advancing America's leadership in space"

VIRGINIA COMMERCIAL SPACE FLIGHT AUTHORITY

April 16, 2018

Dear Chairman Smith, Ranking Member Johnson, Chairman Babin and Ranking Member Bera:

I write to thank you for the inclusion of language in your Manager's Amendment to continue authorization of the 21st Century Launch Complex program, which provides vital infrastructure support for NASA's launch complexes and ranges that support cargo resupply missions to the International Space Station (ISS), including at Wallops Flight Facility. We appreciate the work you and your staff have done to help support this reauthorization and it will ensure that NASA's launch ranges are prepared to meet the growing demands of our space program in the years ahead.

As you may know, state spaceports -- like the Mid-Atlantic Regional Spaceport (MARS) at Wallops -- have invested hundreds of millions of dollars at Federal launch sites to support NASA missions and provide new low-cost capabilities for NASA, Defense and commercial users, while also improving resiliency and responsiveness. The language included in this provision also urges NASA to fully leverage these state investments and partner with state spaceports to meet infrastructure demands to support ISS and other missions.

It is helpful to have NASA regularly reauthorized to ensure that policy provisions continue to keep pace with the important work going on at launch sites and centers. I applaud your efforts to advance a reauthorization bill for FY 2018 and FY 2019 and appreciate the work of your staff and the other Members on your committee to support this process.

Finally, I invite you and your entire committee to join us for our next launch (tentatively scheduled for late May) of Orbital ATK's Antares rocket and Cygnus spacecraft to ISS. We would be honored to host you and show you how our partnership with NASA has and continues to support our nation's space program.

Sincerely,

Dale K. Nash

Dale K. Nash
CEO and Executive Director
Virginia Commercial Space Flight Authority
Mid-Atlantic Regional Spaceport

Mr. BABIN. Thank you, and I yield back.

Chairman SMITH. Thank you, Mr. Babin.

The gentleman from California, the Ranking Member of the Space Subcommittee, Mr. Bera, is recognized for an opening statement.

Mr. BERA. Thank you, Mr. Chairman.

The importance of our investments in NASA and its ability to inspire can't be underestimated. I often talk about my childhood and vivid recollections of the space program and the influence that NASA and the Apollo program had in my pursuit of science and medicine.

NASA's work also helps us attract the best and brightest to go into STEM disciplines and contributes to world-class work force. Our work force not only makes NASA's scientific discoveries possible, but it powers an engine of innovation and economic strength for our country through its advances in human exploration, aeronautics, and space technology.

Mr. Chairman, one of the things that I've enjoyed most about, you know, working with the Ranking Subcommittee Chairman Mr. Babin is how bipartisan our—and collaborative our hearings have been, you know, whether we're talking about deep space exploration, the discovery of planets and the habitable zone, looking for life out there, you know.

But what bothers me and what has me concerned about today's NASA authorization bill under consideration is that both I and my colleagues received this bill on Friday. With Fiscal Year 2018 appropriations of $20.7 billion, NASA's the largest agency under the jurisdiction of this Committee. While I understand the majority and minority staff were communicating on a discussion draft of the bill, Democratic staff did not receive proposed funding numbers and a finalized bill text until late last week.

Mr. Chairman, we both share the goal of sustaining a strong NASA that is funded sufficiently to complete the tasks the Nation has asked of it. However, I have concerns about how a rushed markup process can help us reach that goal together. Our colleagues just returned to Washington last night, leaving little time to fully consider the bill and the funding and policy direction it would give to NASA. Moreover, I remain worried about potential implications of a rushed markup on that important policy, issues regarding our space program, especially in light of NASA's need to reassess program and spending plans following the recently enacted Fiscal Year 2018 omnibus.

Turning to the content of the bill, the proposed $474 million cut to earth sciences for Fiscal Year 2019 is deeply concerning when NASA's earth science data played a key role in informing our response to a number of natural disasters that wreaked havoc this past year.

At the same time, the bill proposes increasing the planetary science account by more than $400 million above Fiscal Year 2018 appropriated levels without any basis policy guidance on how to—how the increase is to be spent. In addition, the astrophysics decadal survey's top-ranked WFIRST mission that we discussed during our NASA Fiscal Year 2019 budget hearing and its poten-

tial to return transformational science is called into question in this bill.

The role of NASA's space technology program, including important initiatives on satellite servicing and its potential applications for industry, also could be shortchanged. Further, policy would be set on the International Space Station transition without the opportunity of our Committee to review NASA's recently submitted transition plan, as required by last year's *NASA Transitional Authorization Act*. The future of ISS is a major policy issue and one that deserves the Committee's oversight.

Mr. Chairman, this Committee's policy and direction for NASA will be felt in the next generation of stargazers, space explorers, business leaders, scientists, and engineers. Before we legislate, we have an obligation to take the time to hold hearings, gather the necessary information, consider the views of stakeholders, and weigh the decisions that will help sustain a strong and stable future for NASA.

With that, I look forward to working with you to that end and having those hearings. Thank you, and I yield back.

Chairman SMITH. OK. Thank you, Mr. Bera. And let me respond to a couple of your points. And the first is to reassure you and other Members of the Committee that between now and the House floor we will continue to have discussions on policies, and those discussions will be in good faith.

I realize that the minority has not had as much time as they would've liked. On the other hand, we have complied with all requirements, legislative and otherwise. And while I regret that staff has to work on weekends, I sometimes think that that simply has to be done. And I know the majority staff did work over the weekend as well.

So I'm hoping we can go forward with a good-faith bipartisan effort that after the Perlmutter amendment will allow all Members to support the bill.

And to that end let me say that we are going to take up the amendment in the nature of a substitute—I mean, the manager's amendment by Mr. Babin first, after which we will go to Mr. Perlmutter's amendment.

Let's see. The gentleman from Texas, Mr. Babin, is recognized to offer the manager's amendment.

Mr. BABIN. Thank you, Mr. Chairman.

Chairman SMITH. And does the gentleman have an amendment at the desk?

Mr. BABIN. I do have an amendment at the desk.

Chairman SMITH. OK. The clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Babin of Texas, amendment number 001.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his manager's amendment.

Mr. BABIN. Thank you, Mr. Chairman.

This amendment represents a good-faith effort to incorporate constructive feedback received from stakeholders after the introduction of the bill. It also contains technical corrections. This amendment emphasizes the President's goal to lead the return of

humans to the moon for long-term exploration and utilization, followed by human missions to Mars and other destinations.

Furthermore, this amendment makes it clear that NASA shall pursue the expeditious development of a new-build second mobile launch platform, and NASA shall also procure a second interim cryogenic propulsion stage.

Finally, this amendment encourages NASA to leverage State Government infrastructure investments and also requires a report by NASA on procurement opportunities, commercial and space services, or infrastructure for exploration.

I support this amendment and urge my colleagues to do the same.

Chairman SMITH. Thank you, Mr. Babin.

Let me respond real quickly and say that I thank him for this amendment. The manager's amendment makes technical and conforming changes to the bill and also makes changes that result from members' and stakeholder feedback. The amendment improves the bill, and I thank again the Chairman of the Space Subcommittee for his good work on this.

And the gentlewoman from Texas, the Ranking Member, is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. I'm reluctantly going to have to oppose the gentleman's amendment in its current form. I appreciate the fact that the amendment fixes some of the problems with the bill that resulted from the rush to mark up the bill that clearly is not ready for markup. Reversing the funding incorrectly allocated to the 2 million exploration projects, SLS and Orion is an obvious example. The amendment also gets rid of problematic commercialization language that had not been adequately vetted.

If the changes had been confined to those items and to the technical corrections that are included, I probably could support this amendment. Unfortunately, the amendment also adds additional provisions, another indication of a bill that was brought to markup before it was ready.

And some of these provisions are problematic or premature. These range from endorsing the President's exploration priorities without even having seen the long overdue exploration roadmap this Committee asked for in *2017 Transition Act*, apparently imposing an unfunded mandate on NASA to develop a second ICPS, and requiring a wasteful and unnecessary GAO report.

In sum, the gentleman's amendment makes some useful corrections, but it also includes additional provisions that need more scrutiny. I hope that the gentleman would consider withdrawing this amendment to allow time to address these issues.

I thank you and yield back.

Chairman SMITH. Thank you, Ms. Johnson. Is there any further discussion on the amendment?

If not, the question is on agreeing to the manager's amendment offered by Mr. Babin.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

The next amendment is going to be an amendment offered by the gentleman from Colorado, Mr. Perlmutter, and he is recognized for that purpose.

Mr. PERLMUTTER. Thank you, Mr. Chairman. I have an amendment at the desk, number 28.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Perlmutter of Colorado, amendment number 028.

Mr. PERLMUTTER. I ask unanimous consent to dispense with the reading of the amendment.

Chairman SMITH. OK. Without objection, the amendment is considered as read, and the gentleman is recognized to explain the amendment.

Mr. PERLMUTTER. The amendment is sort of at the heart of some of the concerns that we have concerning the bill, and I appreciate the Chairman's agreement to continue to allow negotiations by all of us as this—as the overall bill moves forward.

The amendment that I have proposed, amendment 28, is to restore $471 million, which was a 25 percent cut from the Fiscal Year 2018 budget for earth sciences. So the purpose is to restore that cut. I want to remind everyone what earth sciences, what this line item really is. It is to develop a scientific understanding of the earth system and its response to natural or human-induced changes and to improve prediction of climate, weather, and natural hazards both for personal safety, as well as commerce. What we're trying to do is have the best data we can gather about the earth's oceans, service, and atmosphere, and try to understand our planet to the best of our ability. That understanding will improve weather forecasts and has a tremendous impact on the safety of our constituents and the flow of commerce across the world.

I was pleased to see language in this bill which acknowledges the work of the recently released earth sciences decadal survey. Included in the survey was a wealth of information on the importance of earth science data and how we use this data in our daily lives. The decadal survey acknowledged the tight budget environment facing earth science research, and they made some tough decisions in putting together that document, but the fact is that even under current funding there's about 1/3 less than what is necessary. Cuts like initially proposed in the bill of 25 percent only exacerbate the problem and undercut the earth science decadal survey that the bill actually endorses.

So I urge my colleagues, Democrats and Republicans, to support the amendment to restore the $471 million cut to earth sciences so that we can have the equipment and the services that are necessary for us to understand how all of this fits together, whether it's through weather satellites or just the continued observations that we make through the NASA line item budget.

With that, I yield back.

Chairman SMITH. Thank you, Mr. Perlmutter.

Let me recognize myself in support of the amendment and say at the outset I appreciate his initiative in drafting this amendment and offering it now. I also appreciate the support of the Ranking

Member and Mr. Bera, the Ranking Member of the Space Subcommittee.

This was not an easy amendment for the majority to swallow, and I think you all know that. But we are going forward in good faith with majority support because we want to generally and hopefully increase the prospects of this NASA bill going forward on the floor and beyond that. So I recognize this amendment represents a compromise. I hope there will be strong support on both sides to show good faith for the process, which includes bipartisanship discussions, as well as an effort to try to do the best we can for NASA. So, again, thank you for the amendment.

And is there anyone else who wishes to be recognized on this amendment? Does the Ranking Member want to be recognized?

Ms. JOHNSON. I support the amendment, Mr. Chairman.

Chairman SMITH. OK. Thank you. Anyone else? Mr. Bera?

Mr. BERA. I support the amendment as well.

Chairman SMITH. OK. Anyone else want to speak any longer on the amendment?

Mr. PERLMUTTER. I'm happy to talk some more.

Chairman SMITH. OK. And I think we're fine over here. All right. Let's see. Without any further discussion on the amendment, the question is on agreeing to Mr. Perlmutter's amendment.

All in favor, say aye.

Opposed, no.

The amendment is agreed to, and we will now—the gentleman from Colorado is recognized.

Ms. JOHNSON. Can we have a recorded vote?

Chairman SMITH. A recorded vote has been requested, and as mentioned earlier, the recorded votes will be postponed.

Up next is—we'll now go back to regular order on the list of amendments, and the next one is going to be offered by the gentleman from Florida, Mr. Posey, and he is recognized for that purpose.

Mr. POSEY. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Posey of Florida, amendment number 049.

Chairman SMITH. And without objection, the amendment will be considered as read, and the gentleman is recognized to explain his amendment.

Mr. POSEY. Thank you, Mr. Chairman.

Following the public disclosure of security and export control violations at its research centers, the Administration contacted—contracted with the National Academy of Public Administration to conduct an independent assessment of how the Administration carried out foreign national access management practices and other security matters. The assessment by the National Academy of Public Administration concluded that NASA networks are compromised and the Administration lacked a standardized and systematic approach to export compliance and that individuals within the Administration were not held accountable when making serious preventable errors in carrying out foreign national access management processes and other security matters.

This amendment simply requires the Administration to report to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation over in the Senate on how it plans to address each of the recommendations made to the security assessment by the National Academy of Public Administration regarding security and safeguarding export control information. I ask my colleagues to support this amendment, and I yield back the remainder of my time.

Chairman SMITH. Thank you, Mr. Posey, for your amendment, and I support it. It will ensure that the information technology security recommendations from the National Academy of Public Administration on foreign national access management are in fact implemented, and I encourage Members to support the amendment.

Is there anyone who wishes to be recognized on the amendment? If not, the question is on agreeing to the Posey amendment.

All in favor, say aye.

Opposed, no.

The ayes have it and the amendment is agreed to.

We will now go to an amendment to be offered by the gentleman from Florida, Mr. Dunn, and he is recognized.

Mr. DUNN. Thank you, Mr. Chairman. And Chairman Babin of the Subcommittee, Ranking Members——

Chairman SMITH. And——

Mr. DUNN [continuing]. Johnson and Ami Bera.

Chairman SMITH. And the gentleman has an amendment at the desk, and the clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Dunn of Florida, amendment number 041.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman continues to be recognized to explain his amendment.

Mr. DUNN. Thank you very much, Mr. Chairman. This is an exciting day for the Members of the Committee. We have the opportunity to help shape the authorities and funding of NASA and its partners that they'll use to advance space exploration and science. So with that objective in mind, I'm offering amendment 41.

State and local governments have invested hundreds of millions of dollars in new space-related infrastructure that benefits Federal civil programs, national security programs and missions, as well as the commercial space industry. This amendment proposes a report that describes those investments and partnerships that have benefited the Federal, commercial, and State users. It also requires reporting on the prospective or burgeoning opportunities for Federal-State matching grant funding to support shared infrastructure, as well as how these partnerships can be expanded to better serve civil, national security, and commercial space missions.

And I ask that the Committee support this amendment to H.R. 5503. And with that, I yield back. Thank you.

Chairman SMITH. Thank you, Mr. Dunn. I'll recognize myself in support of the amendment, which creates a lasting partnership between NASA and State and local governments.

In a limited budget environment, we must make difficult choices about how to fund Federal programs. The ability to leverage the

strengths and expertise of State and local governments will help to maintain American space leadership now and in the future. So I thank Mr. Dunn for offering this amendment. I urge my colleagues to support it.

If there's no further discussion, all in favor, say aye.

Opposed, no.

The ayes have it and the amendment is agreed to.

Next up is an amendment to be offered by the gentleman from California, Mr. Rohrabacher, and he is recognized for that purpose.

Mr. ROHRABACHER. Thank you very much.

Chairman SMITH. And——

Mr. ROHRABACHER. Mr. Chairman——

Chairman SMITH [continuing]. The gentleman has an amendment at the desk.

Mr. ROHRABACHER. I have an amendment at the desk.

Chairman SMITH. And without objection, the amendment is a—the clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Rohrabacher of California, amendment number 025.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman.

When I first arrived here a number of years ago, I was told that the House and the Senate have one thing in common with both the House and Senate, and that is that we both have 100 Members who are total idiots. And let me just say that what we have been witnessing with the prevention of an Administrator for NASA for over 15 months is a disgrace. It's a disgrace for not just the Senate, not just the House, for Congress in general. Congress is not doing its job in a number of areas. I think it underscores that we do need some fundamental reform of our process, both Senate and House.

But today, we realize that the Senate, on something that could very easily be done, and that is a confirmation of a NASA Administrator. And we have a fellow—a colleague who we all know who's bright, he's creative, who could do—be doing a fantastic job for our country through—as being the Administrator of NASA. He's been held up by the U.S. Senate.

And we need—now, let me just note that Robert Lightfoot as Acting Administrator of NASA has done a terrific job. We've all had a chance to talk with him and work with them, so my hat's off to him, but it is disgraceful that we have not actually put in place an Administrator, permanent Administrator.

So my amendment States—this is getting tough—no appropriations shall be authorized to NASA until a NASA Administrator nominee is confirmed by the U.S. Senate. That's simple as that. And if the Senate doesn't think that it's important enough to vote on a NASA Administrator, maybe they don't think it's important for us to fund NASA. And that's that.

Mr. PERLMUTTER. Does the gentleman yield?

Mr. ROHRABACHER. I certainly would.

Mr. PERLMUTTER. I thank the gentleman for yielding.

And I agree with you 100 percent that Mr. Bridenstine ought to be confirmed by the Senate, and this delay is really unconscionable

because the agency needs leadership. Mr. Lightfoot was fantastic. He has now stepped down. But I'd ask my friend, do you really need the sledgehammer at this point about no funding for NASA? That would be my——

Mr. ROHRABACHER. Well, if the Chairman would ask me to put my big hammer down and lay it aside for a little while, I guess I'd be willing to acquiesce to our fine Chairman.

Chairman SMITH. Does the gentleman wish to withdraw the amendment?

Mr. ROHRABACHER. I withdraw my amendment.

Chairman SMITH. OK. Without objection, the amendment is withdrawn, but you sure got Mr. Perlmutter's attention, which was worth doing.

The gentleman from California has another amendment. He's recognized for the purposes of offering that.

Mr. ROHRABACHER. I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment. This is Rohrabacher second amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Rohrabacher of California, amendment number 026.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain the amendment.

Mr. ROHRABACHER. I have quite often mentioned that there is a major threat looming that we have not dealt with and that we should make sure that we spend more time making sure that our—that the whole job we're trying to do in space cannot be destroyed by space debris. And I believe space debris is a very serious challenge. It's actually—I believe as we move on, space debris is going to be as great a challenge in getting things done in space as are the technical and just—of what we're trying to accomplish with various technologies that we're bringing to bear.

So my amendment again emphasizes that the space debris actually is reaching a point where collisions of—with space debris may cause more space debris. And basically, what we're asking for is that this be reaffirmed in the authorization bill that space debris something that should be a high priority for NASA to be looking at and dealt with.

Chairman SMITH. Does the gentleman yield back his time?

Mr. ROHRABACHER. I yield back.

Chairman SMITH. Thank you, Mr. Rohrabacher. I just want to say I support your amendment. I appreciate your long-standing interest in this subject, and I hope other Members will support it as well.

Does anyone wish to be heard on this amendment?

If not——

Ms. JOHNSON. It just makes more sense than the last one.

Chairman SMITH. The Ranking Member says it makes more sense than the last one. But I'll let—we'll take that as a yes. OK. OK.

All—if there's no further discussion, all in favor of the Rohrabacher amendment—this is the second amendment—say aye.

Opposed, nay.

The ayes have it, and the amendment is agreed to.

And the gentleman from California is recognized for his third and last amendment.

Mr. ROHRABACHER. Yes. I'm buoyed by the fact that I have received such support from the other side of the aisle on my last amendment. Let me note that what we have—and my—oh, I have an amendment at the floor. OK. What it is—we are—determination—insert a new paragraph, determinations by the Administrator or Secretary under paragraph D must be publicly disclosed 30 days prior to the acquisition of such space products.

What we're talking about—my amendment is talking about is there's a requirement that whenever the Administrator makes a decision as to what type of technologies and what type of supplies are needed by the space program, that it—that basically, we—and that we try to do commercial rather than simply leave it a matter of leaving it up to the government and the bureaucracy.

Well, there is an exception to that that allows the—that permits the Administrator to actually, you know, go—to go and decide not to use the commercial alternatives. And it States, "In carrying out space exploration missions, Administrator shall prioritize acquisitions to use in space products provided by the United States and other commercial—and commercial United States providers."

Let me note there is an exception to that provision, and I like the provision. The provision underscores America's fundamental strengths, which is by using the commercial and the private sector, we're able to bring things in a costly manner, actually more costly than just using the government. It creates a marketplace which will bring down the cost of future needs. And anyway, we need to really encourage commercial use and alternatives for our space missions.

My amendment comes to place in that exception which is the NASA Administrator or the Secretary of the Air Force to make a determination that the commercial approach is not—the commercial space is not really right in this specific decision. Well, I think that's fine, but what my amendment does is make certain that there is an accountability if commercial space alternatives are not being used. And it just requires that the Secretary—or the Administrator and the Secretary of Air Force actually make—you know, make public why they made that decision. And it's a matter of transparency basically.

And so with that, I said, it is clear, however, to me that we have not worked out the wording of this in a way that's acceptable to everyone. And I appreciate your leadership, Mr. Chairman, and so I'm going to be withdrawing this amendment, which makes this mandate of whenever they're not using commercial, that it actually be explained and be publicly presented. But we—the idea is a good idea, but I understand there's some objections to specific wording of how my—with an understanding that we'll work together on finding the right wording where both sides of the aisle can agree and that we can all agree. I'd be willing to withdraw my amendment.

Chairman SMITH. OK. And without objection, the amendment is withdrawn, but let me reassure the gentleman from California that, as he suggested, we will continue to work on the language.

And I do appreciate the statement and—that he made and his interest in the subject.

We will now——

Mr. ROHRABACHER. And I withdraw my amendment.

Chairman SMITH. Without objection.

We will now go to another amendment offered by the gentleman from California, Mr.—I mean by Colorado, Mr. Perlmutter.

Mr. PERLMUTTER. Thanks, Mr. Chair. I have an amendment number 27 at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Perlmutter of Colorado, amendment number 027.

Mr. PERLMUTTER. I ask for unanimous consent to dispense with the reading of the amendment.

Chairman SMITH. OK. Without objection.

And the gentleman is recognized to explain the amendment, which is being handed out as we speak. OK. The gentleman is recognized on the condition that he doesn't hold up a bumper sticker that says Mars 2033. Oh, no, no, no, no, no.

Mr. PERLMUTTER. Thanks, Mr. Chair. I know all of you were worried that I wouldn't hold up my bumper sticker of Mars 2033 today, but I just want to assure you we still have plenty, and you're welcome to come to my office and get them for your cars.

As you've all heard me discuss on numerous occasions, we had testimony a couple years ago detailing how the orbits of Earth and Mars align in the year 2033 to be one of the shortest distances which would allow a human mission to Mars to shave off months off of the trip to that planet. Obviously, by shortening the trip, it reduces the risks our astronauts might face from radiation or who knows what else.

Today, we are building the Orion multipurpose crew vehicle and the Space Launch System to carry us on this historic journey, and American industry and our partners around the world are working on the other technologies needed to accomplish this feat.

Because this endeavor is not going to be just NASA or just the United States, we're going to need public-private partnerships and the international community and all work together to get this done, as the Vice President discussed and described in his speech yesterday in Colorado.

The missing piece to this puzzle right now is a requirement for NASA to efficiently plan on how we would take advantage of this opportunity in 2033, if not before, and what we need to be doing on what timelines to get humans to Mars in 2033 or before because we've had testimony from SpaceX and some others that it's possible to get our astronauts to Mars even before 2033. My amendment helps fix that problem by giving NASA the task to better incorporate a 2033 mission into their long-term exploration plans.

A number of people on this panel or in industry are excited by talk from the Administration of going back to moon, but as the Vice President said yesterday and as we've talked about on this Committee, that could just be a steppingstone to our real mission, which ultimately is to get to Mars. I think our—the amendment that I propose accomplishes that, and I urge support for the amendment. And with that, I yield back.

Chairman SMITH. Thank you, Mr. Perlmutter. I support the amendment and yield to the gentleman from Texas, Chairman Babin.

Mr. BABIN. Thank you, Mr. Chairman.

And I thank the gentleman from Colorado for his amendment, which I do support. Human exploration of Mars is a very important—it is the big—the big goal, the ultimate goal is to get to Mars by 2033, if not sooner. There are quite a few things that need to be done science-wise and experimentation-wise. Radiation is one of them, a lot of medical problems that we need to address and remedy before we can get astronauts there and safely back. But this amendment provides great direction to NASA toward that ultimate end, and I fully support it. I yield back.

Chairman SMITH. Thank you, Mr. Babin.

Is there anyone else who wishes to be—the gentlewoman from Texas, the Ranking Member, is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. I support the gentleman's—from Colorado's amendment to privatize human exploration to Mars by 2033. While other human—OK. Prioritize, yes. While other human exploration endeavors that NASA engages in is—all have merit, and I do believe that they should contribute toward the goal of going to Mars.

Mr. Perlmutter's amendment recognizes the priority and also provides a date for NASA to work toward. I think we've heard this date before, and I encourage all of my colleagues to support this amendment, and I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

If there's no further discussion on the amendment, the question is on the Perlmutter amendment.

All in favor, say aye.

All opposed, no.

The ayes have it, and the amendment is agreed to.

The gentleman from Colorado has the next amendment as well, and he is recognized for the purpose of offering that.

Mr. PERLMUTTER. Thank you, Mr. Chair. I have an amendment at the desk, number 26.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Perlmutter of Colorado, amendment number 026.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman from Colorado is recognized to explain the amendment.

Mr. PERLMUTTER. Thank you, Mr. Chair. I'm going to offer this and then withdraw it pursuant to the Chairman's committing to the fact we can negotiate further as this bill moves along in the process.

The bill—or the amendment that I proposed is to add $8 million to the National Space Grant College and Fellowship Program or the Space Grant, and it allows—is part of a competitive State and Federal partnership through a consortia in all 50 States, Puerto Rico, and the District of Columbia. And the program enable students to engage in outreach activities and research projects that

prepare them for STEM careers and working with a wide array of industry partners in their communities.

Space Grant consortia are catalysts in each State to help grow the high-tech work force, and with nearly 1,000 partner institutions, this program promotes aerospace and other NASA and STEM education activities and helps sustain a pipeline of students for innovative high-tech jobs.

When I speak with the aerospace industry in Colorado, one of their biggest needs is a passionate and skilled work force, and the Space Grant helps provide just that. We've held this Space Grant level for a number of years now, even as we've seen the NASA budget grow, and the purpose is to increase that Space Grant line item.

And I would just—before I withdraw it, I would just say to my friends from Texas that just about every single institution in your State—and you have a lot of them—are—benefit in some way or another from the Space Grant program. And I didn't know the University of Texas has like a dozen different venues for their institution, and each one of those benefits.

So it is a—it's an excellent program. It leverages both State and Federal money. The various aerospace companies benefit by it, but certainly NASA and our space program benefit by it. I will withdraw my amendment, Mr. Chairman, so that we can discuss it at greater length as the bill moves through the process.

Chairman SMITH. Without objection, the amendment is withdrawn, but let me reassure the individual that I am and I think a lot of us support the increase of $8 million. And just so that all Members understand why I think this is going to be able to be worked out, the gentleman from Colorado's amendment increases the amount for this fellowship program from $40 million to $48 million. Again, I support that. The only difference of opinion we have is whether the entire category is increased from $100 million to $108 million, so that's, I suspect, fairly easy to work out between now and the House floor. But we do agree with the additional $8 million. The question is whether to increase the overall account by $8 million. So I think we'll work that out.

I appreciate the gentleman withdrawing the amendment. And we have two further amendments. We have a late amendment offered by Mr. Foster and then another amendment offered by Mr. Knight, and I believe that will conclude our markup.

The gentleman from Illinois, Mr. Foster, is recognized for the purpose of offering an amendment.

Mr. FOSTER. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. All right. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Foster of Illinois, amendment number 093.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain the amendment.

Mr. FOSTER. Thank you, Chairman Smith.

My amendment is designed to encourage NASA to have a hard look at reducing or eliminating the use of high-enriched uranium,

otherwise known as weapons-grade uranium, in future missions. As you know, NASA is currently advancing various nuclear reactors for deep space missions, particularly to Mars. One of them is for spacecraft propulsion, which would likely utilize low-enriched, that is non-weapons-grade uranium. The second is for surface power, which would potentially utilize high-enriched or weapons-grade uranium.

High-enriched uranium is one of the most dangerous materials on earth because of its direct significance for potential use in nuclear weapons and acts of nuclear terrorism, which is why the elimination globally of stockpiles has been a longstanding U.S. policy objective. It is also a material that is very dangerous to handle during normal assembly when you can have criticality incidents.

This is appreciated by NASA's Marshall Spaceflight Center, which is leading the development of the propulsion reactor system utilizing low-enriched uranium. An underappreciated point about this is that the utilization of high-enriched uranium in any space reactor would result in considerable security-related cost and inhibit the participation of commercial and academic partners for development of testing—and testing and establish a very worrisome precedent for other countries to use potentially large quantities of high-enriched uranium in their own space programs.

And that is why I am introducing an amendment today to require that the space nuclear power report include a cost analysis of the use of high-enriched uranium versus low-enriched uranium in power generation and other space applications, including surface power and in space propulsion. This cost analysis should include the long-term and especially the security-related costs of the high-enriched versus low-enriched uranium. This I think will help Congress understand the true costs of these different nuclear power sources.

Thank you, and—for your consideration of this amendment, and I urge all of my colleagues to support it.

Chairman SMITH. Thank you, Mr. Foster. I'll recognize myself to speak on the amendment.

And I want to say to the gentleman from Illinois, as well as other Members of the Committee, initially, I was going to oppose this amendment because of its being submitted late and being concerned about the process. I know the Ranking Member and others have made comments about the process on the larger bill, but again, in an effort at comity and bipartisanship today, we're going to overlook the process and I endorse the gentleman's amendment.

Is there anyone else—the gentleman from Texas, Mr. Babin, is recognized.

Mr. BABIN. Yes, sir. Thank you, Mr. Chairman.

I appreciate this amendment from Mr. Foster. We have conducted a number of hearings on this very issue, and I support this amendment.

Chairman SMITH. OK. Thank you, Mr. Babin.

The gentleman from South Carolina, Mr. Norman, is recognized.

Mr. NORMAN. Thank you, Mr. Chairman. Is there a financial impact on this study, and who would the study actually go to? I yield back.

Chairman SMITH. Does the gentleman from Illinois want to respond?

Mr. FOSTER. Well, eventually Congress. I mean, that's a decision we have to make. This is a decision that is—will be partly economic and partly due to national security and ultimately global security. You know, there's—it is almost always true that using high-enriched uranium by itself from an engineering point of view will be a less-expensive alternative. However, there are real secondary costs and, you know, you have to guard high-enriched uranium really carefully because a terrorist group that gets their hands on high-enriched uranium can unfortunately quite easily make a nuclear weapon.

And so that if you go to high-enriched uranium facility, at least in the United States, you go through many levels of barbed wire and personal ID and all this. All of those costs will have to be absorbed by any future mission that contemplates using high-enriched uranium for space applications. And I think that's—that cost—you know, if you visit these facilities, there's an impressive number of people that draw their salaries protecting the high-enriched uranium from potential terrorist attack.

And I just—when ultimately Congress makes that decision, we should appreciate the secondary costs of that decision and I think work hard on engineering and solutions using low-enriched uranium.

Chairman SMITH. Mr. Norman, do you yield back the balance of your time? Does that satisfy you? OK, good.

The gentlewoman from Texas, Ms. Johnson, is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman. I just want to voice that I support the gentleman from Illinois' amendment, Dr. Foster. He raised this issue during the hearing with NASA's Acting Administrator, and I want to commend you for following through because this is the next sensible step, and I thank him.

Chairman SMITH. OK. Thank you, Ms. Johnson.

If there's no further discussion, the question is on the Foster amendment.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

We will now go to our last amendment to be offered by the gentleman from California, Mr. Knight, and he is recognized for that purpose.

Mr. KNIGHT. Thank you, Mr. Chair. I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 5503 offered by Mr. Knight of California.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman from California is recognized.

Mr. KNIGHT. Mr. Chairman, very simply, as Mr. Perlmutter always has his bumper sticker of 2033, I think we should have a new bumper sticker because we are embarking on a new demonstrator. It's the low-boom flight demonstrator, which will show that we can fly over land supersonic and not have the great big boom that everybody is accustomed to.

So if we're going to do that and we are going to put people into airliners at some point and go over Mach 1, then we must make sure that we have all the infrastructure and the chase plane availability out at the test facility so that we can get through this program and be flying supersonic at some point. All of us who fly two times a week I'm sure are very interested in this, and a low-boom supersonic demonstrator will be something that we will all—all Americans will use at some point.

So my amendment is very clear. Just make sure that we have the operational and testing infrastructure there and the availability of the chase planes for the low-boom supersonic demonstrator. Thank you, Mr. Chair.

Chairman SMITH. Thank you, Mr. Knight. We may have a little bit of problem getting that on a bumper sticker because the most succinct description I can come up with is "boom-less supersonic," but that that may not be bad if people know what we're talking about.

I support the gentleman's amendment, appreciate his offering that. Is there anyone else who wishes to be heard on the amendment?

The gentleman——

Mr. ROHRABACHER. Mr. Chairman?

Chairman SMITH. OK. Let me go to Mr. McNerney and then to the gentleman from California. Mr. McNerney.

Mr. MCNERNEY. I just wanted to ask the gentleman from California, most often when you see an amendment, it tells you where it goes in the bill. I don't see any references in here. Is that settled in some way?

Mr. KNIGHT. Yes, I believe that is settled. It'll go into——

Chairman SMITH. It'll be under the aeronautics title.

Mr. KNIGHT [continuing]. The aeronautics part of that.

Chairman SMITH. OK. We should have—thank you for that clarification. It will go under the aeronautics title. We'll——

Mr. KNIGHT. Yes.

Chairman SMITH. Without objection, we'll amend the amendment to make that clear.

Mr. MCNERNEY. OK. I yield back.

Chairman SMITH. OK. And who else wanted to be recognized? OK. The gentleman from California, Mr.——

Mr. ROHRABACHER. Mr. Knight, I'm very pleased that this amendment has been offered. A lot of times we shortchange the aeronautics end of all of this, and this I think is really significant in the fact that if America is going to be a—not just a space power but the No. 1 aviation and aeronautics power in the world and where we're going to sell our future aircraft, we need to have this type of fundamental research that's being done. So I commend my colleague for this, and future aerospace workers throughout the United States will thank him as well. God bless.

Chairman SMITH. Thank you, Mr. Rohrabacher.

If there's no further discussion, all in favor of the Knight amendment, say aye.

Opposed, nay.

The ayes have it and the amendment is agreed to.

We are now going to proceed with the recorded vote that was postponed on the amendment offered by the gentleman from Colorado, Mr. Perlmutter. It's number 28. The ayes prevailed by voice vote, but a recorded vote was requested, and the clerk will call the roll.

The CLERK. Mr. Smith?
Chairman SMITH. Aye.
The CLERK. Mr. Smith votes aye.
Mr. Lucas?
Mr. LUCAS. Aye.
The CLERK. Mr. Lucas votes aye.
Mr. Rohrabacher?
Mr. ROHRABACHER. Aye.
The CLERK. Mr. Rohrabacher votes aye.
Mr. Brooks?
[No response.]
The CLERK. Mr. Hultgren?
Mr. HULTGREN. Aye.
The CLERK. Mr. Hultgren votes aye.
Mr. Posey?
[No response.]
The CLERK. Mr. Massie?
Mr. MASSIE. Aye.
The CLERK. Mr. Massie votes aye.
Mr. Bridenstine?
[No response.]
The CLERK. Mr. Weber?
[No response.]
The CLERK. Mr. Knight?
Mr. KNIGHT. Aye.
The CLERK. Mr. Knight votes aye.
Mr. Babin?
Mr. BABIN. Aye.
The CLERK. Mr. Babin votes aye.
Mrs. Comstock?
Mrs. COMSTOCK. Aye.
The CLERK. Mr.—Mrs. Comstock votes aye.
Mr. Loudermilk?
[No response.]
The CLERK. Mr. Abraham?
Mr. ABRAHAM. Aye.
The CLERK. Mr. Abraham votes aye.
Mr. Webster?
Mr. WEBSTER. Maybe.
The CLERK. Mr. Webster votes aye?
Mr. WEBSTER. Yes.
The CLERK. Mr. Webster votes yes.
Mr. Banks?
Mr. BANKS. Nay.
The CLERK. Mr. Banks votes nay.
Mr. Biggs?
Mr. BIGGS. Nay.
The CLERK. Mr. Biggs votes nay.
Mr. Marshall?

[No response.]
The CLERK. Mr. Dunn?
Mr. DUNN. Yes. Yes.
The CLERK. Mr. Dunn votes aye.
Mr. Higgins?
Mr. HIGGINS. Nay.
The CLERK. Mr. Higgins votes nay.
Mr. Norman?
Mr. NORMAN. No.
The CLERK. Mr. Norman votes nay.
Ms. Johnson?
Ms. JOHNSON. Excuse me. Aye.
The CLERK. Ms. Johnson votes aye.
Ms. Lofgren?
Ms. LOFGREN. Yes.
The CLERK. Ms. Lofgren votes aye.
Mr. Lipinski?
Mr. LIPINSKI. Aye.
The CLERK. Mr. Lipinski votes aye.
Ms. Bonamici?
Ms. BONAMICI. Aye.
The CLERK. Ms. Bonamici votes aye.
Mr. Bera?
Mr. BERA. Yes.
The CLERK. Mr. Bera votes aye.
Ms. Esty?
Ms. ESTY. Aye.
The CLERK. Ms. Esty votes aye.
Mr. Veasey?
Mr. VEASEY. Aye.
The CLERK. Mr. Veasey votes aye.
Mr. Beyer?
Mr. BEYER. Aye.
The CLERK. Mr. Beyer votes aye.
Ms. Rosen?
Ms. ROSEN. Aye.
The CLERK. Ms. Rosen votes aye.
Mr. McNerney?
Mr. MCNERNEY. Aye.
The CLERK. Mr. McNerney votes aye.
Mr. Perlmutter?
Mr. PERLMUTTER. Aye.
The CLERK. Mr. Perlmutter votes aye.
Mr. Tonko?
Mr. TONKO. Aye.
The CLERK. Mr. Tonko votes aye.
Mr. Foster?
Mr. FOSTER. Aye.
The CLERK. Mr. Foster votes aye.
Mr. Takano?
Mr. TAKANO. Aye.
The CLERK. Mr. Takano votes aye.
Ms. Hanabusa?
Ms. HANABUSA. Aye.

The CLERK. Ms. Hanabusa votes aye.

Mr. Crist?

Mr. CRIST. Aye.

The CLERK. Mr. Crist votes aye.

Chairman SMITH. The—before the clerk reports, the gentleman from Kentucky, Mr. Massie, is recognized.

Mr. MASSIE. Mr. Chairman, how am I recorded?

Chairman SMITH. How is Mr. Massie recorded?

The CLERK. Mr. Massie is recorded as voting aye.

Mr. MASSIE. I'd like to be recorded as nay.

The CLERK. Mr. Massie votes nay.

Chairman SMITH. The gentleman from Florida, Mr. Posey?

Mr. POSEY. Yes.

Chairman SMITH. Votes aye. OK. The clerk will report when she is ready.

The CLERK. Mr. Chairman, 27 Members voted aye, 5 Members voted nay.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: 04/17/2018

Bill: H.R. 5503 AMENDMENT NO. 028
ROLL CALL NO. 1

Amendment Sponsor: Mr. Perlmutter (D-CO) PASSED

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* – *TX*	X			
2 Mr. LUCAS – *OK* **	X			
3 Mr. ROHRABACHER – *CA*	X			
4 Mr. BROOKS – *AL*				
5 Mr. HULTGREN – *IL*	X			
6 Mr. POSEY – *FL*	X			
7 Mr. MASSIE – *KY*		X		
8 Mr. BRIDENSTINE – *OK*				
9 Mr. WEBER – *TX*				
10 Mr. KNIGHT – *CA*	X			
11 Mr. BABIN – *TX*	X			
12 Mrs. COMSTOCK – *VA*	X			
13 Mr. LOUDERMILK – *GA*				
14 Mr. ABRAHAM – *LA*	X			
15 Mr. WEBSTER – *FL*	X			
16 Mr. BANKS – *IN*		X		
17 Mr. BIGGS – *AZ*		X		
18 Mr. MARSHALL – *KS*				
19 Mr. DUNN – *FL*	X			
20 Mr. HIGGINS – *LA*		X		
21 Mr. NORMAN – *SC*		X		
22 VACANT				
1 Ms. JOHNSON, *Ranking* – *TX*	X			
2 Ms. LOFGREN – *CA*	X			
3 Mr. LIPINSKI – *IL*	X			
4 Ms. BONAMICI – *OR*	X			
5 Mr. BERA – *CA*	X			
6 Ms. ESTY – *CT*	X			
7 Mr. VEASEY – *TX*	X			
8 Mr. BEYER – *VA*	X			
9 Ms. ROSEN – *NV*	X			
10 Mr. MCNERNEY – *CA*	X			
11 Mr. PERLMUTTER – *CO*	X			
12 Mr. TONKO – *NY*	X			
13 Mr. FOSTER – *IL*	X			
14 Mr. TAKANO – *CA*	X			
15 Ms. HANABUSA – *HI*	X			
16 Mr. CRIST – *FL*	X			
17 VACANT				
TOTALS	27	5		

** Vice Chair

Chairman SMITH. The amendment—the ayes have it, and the amendment is agreed to.

A reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5503, as amended, to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 5503 to the House, as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Ms. JOHNSON. Mr. Chairman, could we have a recorded vote?

Chairman SMITH. A recorded vote has been requested, and the clerk will call the roll.

The CLERK. Mr. Smith?

Chairman SMITH. Aye.

The CLERK. Mr. Smith votes aye.

Mr. Lucas?

Mr. LUCAS. Aye.

The CLERK. Mr. Lucas votes aye.

Mr. Rohrabacher?

Mr. ROHRABACHER. Aye.

The CLERK. Mr. Rohrabacher votes aye.

Mr. Brooks?

[No response.]

The CLERK. Mr. Hultgren?

Mr. HULTGREN. Aye.

The CLERK. Mr. Hultgren votes aye.

Mr. Posey?

Mr. POSEY. Aye.

The CLERK. Mr. Posey votes aye.

Mr. Massie?

Mr. MASSIE. Aye.

The CLERK. Mr. Massie votes aye.

Mr. Bridenstine?

[No response.]

The CLERK. Mr. Weber?

Mr. WEBER. Aye.

The CLERK. Mr. Weber votes aye.

Mr. Knight?

Mr. KNIGHT. Aye.

The CLERK. Mr. Knight votes aye.

Mr. Babin?

Mr. BABIN. Aye.

The CLERK. Mr. Babin votes aye.

Mrs. Comstock?

Mrs. COMSTOCK. Aye.

The CLERK. Mrs. Comstock votes aye.

Mr. Loudermilk?

[No response.]

The CLERK. Mr. Abraham?

Mr. ABRAHAM. Aye.

The CLERK. Mr. Abraham votes aye.

Mr. Webster?

Mr. WEBSTER. Aye.

The CLERK. Mr. Webster votes aye.
Mr. Banks?
Mr. BANKS. Aye.
The CLERK. Mr. Banks votes aye.
Mr. Biggs?
Mr. BIGGS. Aye.
The CLERK. Mr. Biggs votes aye.
Mr. Marshall?
[No response.]
The CLERK. Mr. Dunn?
Mr. DUNN. Aye.
The CLERK. Mr. Dunn votes aye.
Mr. Higgins?
Mr. HIGGINS. Aye.
The CLERK. Mr. Higgins votes aye.
Mr. Norman?
Mr. NORMAN. Aye.
The CLERK. Mr. Norman votes aye.
Ms. Johnson?
Ms. JOHNSON. Aye.
The CLERK. Ms. Johnson votes aye.
Ms. Lofgren?
Ms. LOFGREN. No.
The CLERK. Ms. Lofgren votes nay.
Mr. Lipinski?
Mr. LIPINSKI. Aye.
The CLERK. Mr. Lipinski votes aye.
Ms. Bonamici?
Ms. BONAMICI. Nay.
The CLERK. Ms. Bonamici votes nay.
Mr. Bera?
Mr. BERA. Aye.
The CLERK. Mr. Bera votes aye.
Ms. Esty?
Ms. ESTY. Aye.
The CLERK. Ms. Esty votes aye.
Mr. Veasey?
Mr. VEASEY. Yes.
The CLERK. Mr. Veasey votes aye.
Mr. Beyer?
Mr. BEYER. Nay.
The CLERK. Mr. Beyer votes nay.
Ms. Rosen?
Ms. ROSEN. Nay.
The CLERK. Ms. Rosen votes nay.
Mr. McNerney?
Mr. MCNERNEY. Aye.
The CLERK. Mr. McNerney votes aye.
Mr. Perlmutter?
Mr. PERLMUTTER. Aye.
The CLERK. Mr. Perlmutter votes aye.
Mr. Tonko?
Mr. TONKO. No.
The CLERK. Mr. Tonko votes nay.

Mr. Foster?

Mr. FOSTER. Nay.

The CLERK. Mr. Foster votes nay.

Mr. Takano?

Mr. TAKANO. No.

The CLERK. Mr. Takano votes nay.

Ms. Hanabusa?

Ms. HANABUSA. Aye.

The CLERK. Ms. Hanabusa votes aye.

Mr. Crist?

Mr. CRIST. Aye.

The CLERK. Mr. Crist votes aye.

Chairman SMITH. And the clerk will report.

The CLERK. Mr. Chairman, 26 Members voted aye, 7 Members voted nay.

Chairman SMITH. The ayes have it, and the bill is ordered reported favorably.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: 04/17/2018

Bill: H.R. 5503 FINAL PASSAGE
ROLL CALL NO. 2

PASSED

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* – *TX*	X			
2 Mr. LUCAS – *OK* **	X			
3 Mr. ROHRABACHER – *CA*	X			
4 Mr. BROOKS – *AL*				
5 Mr. HULTGREN – *IL*	X			
6 Mr. POSEY – *FL*	X			
7 Mr. MASSIE – *KY*	X			
8 Mr. BRIDENSTINE – *OK*				
9 Mr. WEBER – *TX*	X			
10 Mr. KNIGHT – *CA*	X			
11 Mr. BABIN – *TX*	X			
12 Mrs. COMSTOCK – *VA*	X			
13 Mr. LOUDERMILK – *GA*				
14 Mr. ABRAHAM – *LA*	X			
15 Mr. WEBSTER – *FL*	X			
16 Mr. BANKS – *IN*	X			
17 Mr. BIGGS – *AZ*	X			
18 Mr. MARSHALL – *KS*				
19 Mr. DUNN – *FL*	X			
20 Mr. HIGGINS – *LA*	X			
21 Mr. NORMAN – *SC*	X			
22 VACANT				
1 Ms. JOHNSON, *Ranking* – *TX*	X			
2 Ms. LOFGREN – *CA*		X		
3 Mr. LIPINSKI – *IL*	X			
4 Ms. BONAMICI – *OR*		X		
5 Mr. BERA – *CA*	X			
6 Ms. ESTY – *CT*	X			
7 Mr. VEASEY – *TX*	X			
8 Mr. BEYER – *VA*		X		
9 Ms. ROSEN – *NV*		X		
10 Mr. MCNERNEY – *CA*	X			
11 Mr. PERLMUTTER – *CO*	X			
12 Mr. TONKO – *NY*		X		
13 Mr. FOSTER – *IL*		X		
14 Mr. TAKANO – *CA*		X		
15 Ms. HANABUSA – *HI*	X			
16 Mr. CRIST – *FL*	X			
17 VACANT				
TOTALS	26	7		

** Vice Chair

Without objection, the motion to reconsider is laid upon the table. H.R. 5503 is ordered reported to the House. I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

Before we adjourn, real quickly, I thank Members for their participation. We had a great turnout today. And I thank those who decided to vote aye in favor of this bipartisan bill, which I hope and expect will increase its prospects of being enacted. So I thank everyone for their participation regardless.

If there's no further discussion, that completes our business, and this concludes the Science Committee markup. Without objection, the Committee stands adjourned, and Alden is going to come up here and hit the gavel for me.

[Whereupon, at 12:21 p.m., the Committee was adjourned.]

Appendix:

H.R. 5509, Amendment Roster, H.R. 5503, Amendment Roster

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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To direct the National Science Foundation to provide grants for research about STEM education approaches and the STEM-related workforce, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To direct the National Science Foundation to provide grants for research about STEM education approaches and the STEM-related workforce, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Innovations in Mentoring, Training, and Apprenticeships Act".

SEC. 2. FINDINGS.

Congress finds the following:

1 (1) To remain competitive in the global econ-
2 omy, foster greater innovation, and provide a foun-
3 dation for shared prosperity, the United States
4 needs a workforce with the right mix of skills to
5 meet the diverse needs of the economy.
6 (2) Evidence indicates that the returns on in-
7 vestments in technical skills in the labor market are
8 strong when students successfully complete their
9 training and gain credentials sought by employers.
10 (3) The responsibility for developing and sus-
11 taining a skilled technical workforce is fragmented
12 across many groups, including educators; students;
13 workers; employers; Federal, State, and local govern-
14 ments; labor organizations; and civic associations.
15 Such groups need to be able to coordinate and co-
16 operate successfully with each other.
17 (4) Coordination among students, community
18 colleges, secondary and post-secondary institutions,
19 and employers would improve educational outcomes.
20 (5) Promising experiments currently underway
21 may guide innovation and reform, but scalability of
22 some of those experiments has not yet been tested.
23 (6) Evidence suggests that integration of aca-
24 demic education, technical training, and hands-on
25 work experience improves outcomes and return on

1 investment for students in secondary and post-sec-
2 ondary education and for skilled technical workers in
3 different career stages.
4 (7) Outcomes show that mentoring can increase
5 STEM student engagement and the rate of comple-
6 tion of STEM post-secondary degrees.

7 **SEC. 3. NATIONAL SCIENCE FOUNDATION STEM INNOVA-**
8 **TION AND APPRENTICESHIP GRANTS.**

9 (a) ESTABLISHMENT.—The Director of the National
10 Science Foundation shall award competitive grants to eli-
11 gible applicants in accordance with this section.
12 (b) COORDINATION.—In carrying out this section, the
13 Director shall consult and cooperate with the programs
14 and policies of other relevant Federal agencies to avoid
15 duplication with, and enhance the effectiveness of, the pro-
16 vision of grants under this section.
17 (c) GRANTS FOR ASSOCIATE DEGREE PROGRAMS IN
18 STEM FIELDS.—
19 (1) IN GENERAL.—The Director of the National
20 Science Foundation shall award competitive grants
21 to community colleges to develop or improve asso-
22 ciate degree and certificate programs in STEM
23 fields in which there is significant workforce demand
24 in the region of the community college receiving the

1 award and a need to strengthen the global competi-
2 tiveness of affected companies.
3 (2) APPLICATION.—In considering applications
4 for grants under paragraph (1), the Director shall
5 prioritize—
6 (A) applicants that consist of a partnership
7 between the applying community college and in-
8 dividual employers or an employer consortia,
9 and may include a university or other organiza-
10 tion with demonstrated expertise in academic
11 program development;
12 (B) applications that demonstrate current
13 and future workforce demand in occupations di-
14 rectly related to the proposed associate degree
15 or certificate program.
16 (C) applications that include commitments
17 by the partnering employers or employer con-
18 sortia to offer apprenticeships, internships or
19 other applied learning opportunities to students
20 enrolled in the proposed associate degree pro-
21 gram; and
22 (D) applications that include outreach
23 plans and goals for recruiting and enrolling
24 women and other historically underrepresented

1 individuals in STEM studies and careers in the
2 proposed associate degree program.
3 (3) FUNDING.—The National Science Founda-
4 tion shall devote not less than $20,000,000 to
5 awards described in this subsection, which shall in-
6 clude not less than $5,000,000 for each of fiscal
7 years 2018 through 2021, subject to the availability
8 of appropriations, to come from amounts made avail-
9 able for the Education and Human Resources Direc-
10 torate. This subsection shall be carried out using
11 funds otherwise appropriated by law after the date
12 of enactment of this Act.
13 (d) GRANTS FOR STEM DEGREE APPLIED LEARN-
14 ING OPPORTUNITIES.—
15 (1) IN GENERAL.—The Director of the National
16 Science Foundation shall award competitive grants
17 to universities partnering with employers or em-
18 ployer consortia that commit to offering apprentice-
19 ships, internships, research opportunities, or applied
20 learning experiences to enrolled university students
21 in identified four-year STEM degree programs.
22 (2) APPLICATION.—In considering applications
23 for grants under paragraph (1), the Director shall
24 prioritize—

1 (A) applicants that consist of a partnership
2 between—
3 (i) the applying university; and
4 (ii) individual employers or an em-
5 ployer consortia;
6 (B) applications that demonstrate current
7 and future workforce demand in occupations di-
8 rectly related to selected STEM fields; and
9 (C) applications that include outreach
10 plans and goals for recruiting and enrolling
11 women and other populations historically under-
12 represented in STEM.
13 (3) FUNDING.—The National Science Founda-
14 tion shall devote not less than $10,000,000 to
15 awards described in this subsection, which shall in-
16 clude not less than $2,500,000 for each of fiscal
17 years 2018 through 2021, subject to the availability
18 of appropriations, to come from amounts made avail-
19 able for the Education and Human Resources Direc-
20 torate. This subsection shall be carried out using
21 funds otherwise appropriated by law after the date
22 of enactment of this Act.
23 (e) GRANTS FOR COMPUTER-BASED AND ONLINE
24 STEM EDUCATION COURSES.—

1 (1) IN GENERAL.—The Director of the National
2 Science Foundation shall award competitive grants
3 to institutions of higher education or nonprofit orga-
4 nizations to conduct research on student outcomes
5 and determine best practices and scalability of com-
6 puter-based and online courses for technical skills
7 training.
8 (2) RESEARCH AREAS.—The research areas eli-
9 gible for funding under this subsection may in-
10 clude—
11 (A) post-secondary courses for technical
12 training for STEM occupations;
13 (B) improving high-school level vocational
14 training in STEM subjects;
15 (C) encouraging and sustaining interest
16 and achievement levels in STEM subjects
17 among women and other populations histori-
18 cally underrepresented in STEM studies and
19 careers; and
20 (D) combining computer-based and online
21 STEM education and training with traditional
22 mentoring and other mentoring arrangements,
23 apprenticeships, internships, and other applied
24 learning opportunities.

1 (3) FUNDING.—The National Science Founda-
2 tion shall devote not less than $10,000,000 to
3 awards described in this subsection, which shall in-
4 clude not less than $2,500,000 for each of fiscal
5 years 2018 through 2021, subject to the availability
6 of appropriations, to come from amounts made avail-
7 able for the Education and Human Resources Direc-
8 torate. This subsection shall be carried out using
9 funds otherwise appropriated by law after the date
10 of enactment of this Act.

11 **SEC. 4. RESEARCH ON EFFICIENCY OF SKILLED TECH-**
12 **NICAL LABOR MARKETS.**

13 (a) EFFICIENCY OF SKILLED TECHNICAL LABOR
14 MARKETS.—The Directorate of Social, Behavioral & Eco-
15 nomic Sciences of the National Science Foundation, in co-
16 ordination with the Secretary of Labor, shall support re-
17 search that improves the efficiency of skilled technical
18 labor markets in the United States, including research on
19 labor market analysis innovations, data and information
20 sciences, electronic information tools and methodologies,
21 and metrics.

22 (b) COMPARISON OF UNITED STATES WORK-
23 FORCE.—

24 (1) RESEARCH.—The National Science Founda-
25 tion shall commission research that compares and

1 contrasts skilled technical workforce development be-
2 tween the United States and other developed coun-
3 tries, including the diversity of skilled technical and
4 professional workforces, to the extent feasible.
5 (2) REPORT.—Not later than 3 years after the
6 date of enactment of this Act, the Director of the
7 National Science Foundation shall submit to Con-
8 gress a report on the results of the study under
9 paragraph (1).
10 (c) SKILLED TECHNICAL WORKFORCE.—
11 (1) REVIEW.—The National Center for Science
12 and Engineering Statistics of the National Science
13 Foundation shall consult and coordinate with other
14 relevant Federal statistical agencies to explore the
15 feasibility of expanding its surveys to include the col-
16 lection of objective data on the skilled technical
17 workforce.
18 (2) REPORT.—Not later than 1 year after the
19 date of enactment of this Act, the Director of the
20 National Science Foundation shall submit to Con-
21 gress a report containing the progress made in ex-
22 panding the National Center for Science and Engi-
23 neering Statistics surveys to include the skilled tech-
24 nical workforce. Such report shall include a plan for
25 multi-agency collaboration in order to effect data

1 collection and reporting of data on the skilled tech-
2 nical workforce.

3 **SEC. 5. SPENDING LIMITATION.**

4 No additional funds are authorized to be appro-
5 priated to carry out this Act and the amendments made
6 by this Act, and this Act and such amendments shall be
7 carried out using amounts otherwise available for such
8 purpose.

9 **SEC. 6. EVALUATION AND REPORT.**

10 (a) EVALUATION.—

11 (1) IN GENERAL.—Not later than 2 years after
12 the date of enactment of this Act, the Director of
13 the Foundation shall evaluate the grants and pro-
14 grams provided under this Act.

15 (2) REQUIREMENTS.—In conducting the evalua-
16 tion under paragraph (1), the Director shall use a
17 common set of benchmarks and assessment tools to
18 identify best practices and materials developed or
19 demonstrated by the research conducted pursuant to
20 such grants and programs.

21 (b) REPORT ON EVALUATIONS.—Not later than 180
22 days after the completion of the evaluation under sub-
23 section (a), the Director of the Foundation shall submit
24 to Congress and make widely available to the public a re-
25 port that includes—

1 (1) the results of the evaluation; and

2 (2) any recommendations for administrative
3 and legislative action that could optimize the effec-
4 tiveness of the grants and programs under this Act.

5 (c) CONSULTATION.—In carrying out this section, the
6 Director of the Foundation shall consult the programs and
7 policies of other relevant Federal agencies to avoid dupli-
8 cation with, and enhance the effectiveness of, the grants
9 and programs under this Act.

10 **SEC. 7. DEFINITIONS.**

11 In this Act:

12 (1) STEM.—The term "STEM" means science,
13 technology, engineering, and mathematics, including
14 computer science.

15 (2) COMMUNITY COLLEGE.—The term "commu-
16 nity college" has the meaning given the term "junior
17 and community college" in section 312 of the Higher
18 Education Act of 1965 (20 U.S.C. 1058).

19 (3) INSTITUTION OF HIGHER EDUCATION.—The
20 term "institution of higher education" has the
21 meaning given such term in section 101(a) of the
22 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

23 (4) REGION.—The term "region" means a labor
24 market area, as such term is defined in section 3 of

1 the Workforce Innovation and Opportunity Act (29
2 U.S.C. 3102).
3 (5) SKILLED TECHNICAL WORKFORCE.—The
4 term "skilled technical workforce" means workers
5 with high school diplomas and two-year technical
6 training or certifications who employ significant lev-
7 els of STEM knowledge in their jobs.
8 (6) UNIVERSITY.—The term "university"
9 means a 4-year institution of higher education, as
10 defined in section 101(a) of the Higher Education
11 Act of 1965 (20 U.S.C. 1001(a).

AMENDMENT TO H.R. _____

OFFERED BY MS. BONAMICI OF OREGON

Page 4, line 11, insert ", including expertise in integrating art and design into STEM fields" after "development".

☒

AMENDMENT TO H.R. 5509

OFFERED BY MS. BONAMICI OF OREGON

Page 4, line 8, insert ", or industry or sector partnerships" after "employer consortia".

Page 4, line 18, insert ", or industry or sector partnerships," before "to offer apprenticeships".

Page 5, line 18, insert ", or industry or sector partnerships," before "that commit to offering".

Page 6, line 5, insert ", or industry or sector partnerships" after "consortia".

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.....
(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2018 and 2019, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. BABIN introduced the following bill; which was referred to the Committee on _____

A BILL

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2018 and 2019, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "National Aeronautics and Space Administration Authorization Act of 2018".

(b) TABLE OF CONTENTS.—The table of contents for this Act is the following:

Sec. 1. Short title; table of contents.
Sec. 2. Definitions.

TITLE I—AUTHORIZATION OF APPROPRIATIONS

Sec. 101. Fiscal year 2018.
Sec. 102. Fiscal year 2019.

TITLE II—HUMAN EXPLORATION

Sec. 201. Space facilities beyond low-Earth orbit.
Sec. 202. ISS transition.
Sec. 203. Human spaceflight research.
Sec. 204. Critical path redundancy for human spaceflight.
Sec. 205. Space suits.

TITLE III—SCIENCE

Subtitle A—Earth Science

Sec. 301. Reimbursable basis for development of sensors and instruments.
Sec. 302. Earth observations study.
Sec. 303. Land imaging.
Sec. 304. Landsat data policy.
Sec. 305. Earth science missions.
Sec. 306. Goddard Institute for Space Studies Inspector General report.

Subtitle B—Astronomy and Astrophysics

Sec. 311. Search for the origin, evolution, distribution, and future of life in the universe.
Sec. 312. Wide-Field Infrared Space Telescope.

Subtitle C—Planetary Science

Sec. 321. Near-Earth Object Survey.
Sec. 322. Space nuclear power.

TITLE IV—AERONAUTICS

Sec. 401. Supersonic research.
Sec. 402. Unmanned aircraft systems research.
Sec. 403. 21st Century Aeronautics Research Capabilities Initiative.
Sec. 404. Experimental plane program.
Sec. 405. Hypersonic Technology project.

TITLE V—COMMERCIAL

Sec. 501. Commercial supply of space products.
Sec. 502. Commercial provision of services.
Sec. 503. Commercial in-space infrastructure.
Sec. 504. Preference for launch vehicles manufactured in the United States.
Sec. 505. Studies on industrial base.
Sec. 506. Spectrum coordination.
Sec. 507. Enhanced-use leasing.
Sec. 508. Satellite servicing technologies.

TITLE VI—POLICY

Sec. 601. NASA-funded institutes.
Sec. 602. Baseline and cost controls.
Sec. 603. Reports to Congress.
Sec. 604. International technical and operational standards.
Sec. 605. NASA contractor responsibility watch list.
Sec. 606. Human space exploration risk.

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATOR.—The term "Administrator" means the Administrator of NASA.

(2) CIS-LUNAR SPACE.—The term "cis-lunar space" means the region of space from the Earth out to and including the region around the surface of the Moon.

(3) ISS.—The term "ISS" means the International Space Station.

(4) NASA.—The term "NASA" means the National Aeronautics and Space Administration.

(5) NEAR-EARTH ASTEROID.—The term "near-Earth asteroid" means an asteroid with a perihelion distance of less than 1.3 Astronomical Units from the Sun.

(6) NEAR-EARTH OBJECT.—The term "near-Earth object" means an asteroid or comet with a perihelion distance of less than 1.3 Astronomical Units from the Sun.

(7) NONPROFIT ORGANIZATION.—The term "nonprofit organization" means an organization de-

1 termined by the Secretary of the Treasury to be an
2 organization described in section 501(c)(3) of the
3 Internal Revenue Code of 1986 (26 U.S.C.
4 501(c)(3)) which is exempt from taxation under sec-
5 tion 501(a) of such Code.
6 (8) ORION.—The term "Orion" means the mul-
7 tipurpose crew vehicle described under section 303
8 of the National Aeronautics and Space Administra-
9 tion Authorization Act of 2010 (42 U.S.C. 18323).
10 (9) SPACE LAUNCH SYSTEM.—The term "Space
11 Launch System" has the meaning given the term in
12 section 3 of the National Aeronautics and Space Ad-
13 ministration Authorization Act of 2010 (42 U.S.C.
14 18302).

15 TITLE I—AUTHORIZATION OF 16 APPROPRIATIONS

17 **SEC. 101. FISCAL YEAR 2018.**

18 There are authorized to be appropriated to NASA for
19 fiscal year 2018, $20,736,140,000, as follows:
20 (1) For Science, $6,221,500,000, of which—
21 (A) $1,921,000,000 is for Earth Science;
22 (B) $2,227,900,000 is for Planetary
23 Science;
24 (C) $850,400,000 is for Astrophysics;

1 (D) $533,700,000 is for the James Webb
2 Space Telescope; and
3 (E) $688,500,000 is for Heliophysics.
4 (2) For Aeronautics, $685,000,000.
5 (3) For Space Technology, $760,000,000.
6 (4) For Exploration, $4,790,000,000, of
7 which—
8 (A) $1,350,000,000 is for Orion and asso-
9 ciated program and other necessary support;
10 (B) $2,150,000,000 is for the Space
11 Launch System and associated program and
12 other necessary support;
13 (C) $895,000,000 is for Exploration
14 Ground Systems; and
15 (D) $395,000,000 is for Exploration Re-
16 search and Development.
17 (5) For Space Operations, $4,751,500,000.
18 (6) For Education, $100,000,000, of which—
19 (A) $18,000,000 is for the Experimental
20 Program to Stimulate Competitive Research;
21 and
22 (B) $40,000,000 is for the National Space
23 Grant College and Fellowship Program.
24 (7) For Safety, Security, and Mission Services,
25 $2,826,900,000.

(8) For Construction and Environmental Compliance and Restoration, $562,240,000.

(9) For Inspector General, $39,000,000.

SEC. 102. FISCAL YEAR 2019.

There are authorized to be appropriated to NASA for fiscal year 2019, $20,736,140,000, as follows:

(1) For Deep Space Exploration Systems, $4,929,000,000, of which—

(A) $4,040,000,000 is for Exploration Systems Development, of which—

(i) $2,150,000,000 is for Orion and associated program and other necessary support;

(ii) $1,350,000,000 is for the Space Launch System and associated program and other necessary support; and

(iii) $540,000,000 is for Exploration Ground Systems; and

(B) $889,000,000 is for Advanced Exploration Systems, of which—

(i) $504,300,000 is for the Lunar Orbital Platform–Gateway and associated program and other necessary support;

(ii) $116,500,000 is for Advanced Cislunar and Surface Capabilities; and

1 (iii) $268,200,000 is for Exploration
2 Advanced Systems.
3 (2) For Exploration and Research Technology,
4 $1,017,700,000, of which—
5 (A) $108,500,000 is for Early Stage Inno-
6 vation and Partnerships;
7 (B) $216,500,000 if for Technology Matu-
8 ration, of which $75,000,000 is for nuclear fis-
9 sion and cryogenic fluid management develop-
10 ment;
11 (C) $332,700,000 is for Technology Dem-
12 onstration.
13 (D) $140,000,000 is for Human Research
14 Program; and
15 (E) $205,000,000 is for Small Business
16 Innovation Research and Small Business Tech-
17 nology Transfer.
18 (3) For Low-Earth Orbit and Spaceflight Oper-
19 ations, $4,624,600,000, of which—
20 (A) $1,462,200,000 is for the Inter-
21 national Space Station;
22 (B) $2,108,700,000 is for Space Transpor-
23 tation;
24 (C) $903,700,000 is for Space Flight Sup-
25 port; and

(D) $150,000,000 is for Commercial Low-Earth Orbit Development.

(4) For Science, $6,152,600,000, of which—

(A) $1,450,000,000 is for Earth Science;

(B) $2,636,500,000 is for Planetary Science;

(C) $1,375,400,000 is for Astrophysics; and

(D) $690,700,000 is for Heliophysics.

(5) For Aeronautics, $685,000,000.

(6) For Education, $100,000,000, of which—

(A) $18,000,000 is for the Established Program to Stimulate Competitive Research; and

(B) $40,000,000 is for Space Grant.

(7) For Safety, Security, and Mission Services, $2,749,700,000.

(8) For Construction and Environmental Compliance and Restoration, $438,200,000.

(9) For Inspector General, $39,300,000.

TITLE II—HUMAN EXPLORATION

SEC. 201. SPACE FACILITIES BEYOND LOW-EARTH ORBIT.

(a) SENSE OF CONGRESS.—It is the sense of Congress that space facilities for use beyond low-Earth orbit play a significant role in NASA's long-term pursuit of its

1 exploration goals under section 202(a) of the National
2 Aeronautics and Space Administration Authorization Act
3 of 2010 (42 U.S.C. 18312(a)).
4 (b) CREWED AND CREW-TENDED SPACE FACILITIES
5 REPORT.—
6 (1) IN GENERAL.—Not later than 90 days after
7 the date of enactment of this Act, the Administrator
8 shall submit to the Committee on Science, Space,
9 and Technology of the House of Representatives and
10 the Committee on Commerce, Science, and Trans-
11 portation of the Senate a report on the potential de-
12 velopment of space facilities for use beyond low-
13 Earth orbit.
14 (2) CONTENTS.—The report required under
15 paragraph (1) shall include a description of—
16 (A) how each such space facility can ad-
17 vance, enable, or complement human explo-
18 ration of the Solar System, including of the at-
19 mosphere and the surface of celestial bodies;
20 (B) the role of the space facility as a stag-
21 ing, logistics, and operations hub in an explo-
22 ration architecture;
23 (C) how the space facility could support
24 the research, development, testing, validation,

1 operation, and launch of space exploration sys-
2 tems and technologies;
3 (D) opportunities and strategies for com-
4 mercial operation or public-private partnerships
5 that protect taxpayer interests and foster com-
6 petition; and
7 (E) the role of such a space facility in
8 making, developing, and refining the case for
9 further crewed and uncrewed exploration invest-
10 ments.

11 **SEC. 202. ISS TRANSITION.**

12 (a) FINDINGS.—Congress finds the following:
13 (1) The ISS is a valuable national asset that
14 can continue to produce worthwhile scientific re-
15 search and valuable technology.
16 (2) The ISS mission should be to carry out
17 microgravity research and development, research in
18 support of deep space human exploration, and low-
19 Earth orbit commercialization.
20 (3) The ISS is the best platform currently
21 available to conduct certain types of research needed
22 for NASA's deep space human exploration program
23 with such research currently scheduled to be com-
24 pleted by the end of fiscal year 2024.

1 (4) The ISS transition report, submitted pursu-
2 ant to section 50111(c)(2) of title 51, United States
3 Code, provides an explanation of NASA's plans to
4 foster the development of private industry capabili-
5 ties and private demand with a goal of ending direct
6 NASA support for ISS operations by the end of fis-
7 cal year 2024.
8 (5) The plans laid out in the ISS transition re-
9 port are conditionally flexible and require feedback
10 to inform next steps. In addition, the feasibility of
11 ending direct NASA support for ISS operations by
12 the end of fiscal year 2024 is dependent on many
13 factors, some of which are indeterminate until the
14 Administration carries out the initial phases of the
15 ISS transition plan.
16 (6) The value of any in-space facility, such as
17 the ISS, depends both on its contributions to further
18 expansion of human presence throughout the solar
19 system, pursuant to section 202 of the National Aer-
20 onautics and Space Administration Authorization
21 Act of 2010 (42 U.S.C. 18312) and to making exist-
22 ing presence self-sustaining.
23 (7) As the United States moves towards a com-
24 mitment to a human presence off the surface of the
25 Earth, other Government agencies should seek to

1 benefit from and capitalize upon the ongoing human
2 presence in space.
3 (b) IN GENERAL.—The Administration shall support
4 Johnson Space Center as a center of innovation and lead-
5 ership in developing human operations, including surfaces
6 of celestial bodies, beyond Earth, to the cis-lunar region,
7 the Moon, Mars, and beyond.
8 (c) ISS OPERATION.—
9 (1) IN GENERAL.—NASA shall continue oper-
10 ation of the International Space Station for such
11 time as Congress authorizes its operations.
12 (2) INTERNATIONAL AGREEMENTS.—NASA
13 shall pursue international agreements to provide
14 maximum flexibility for ISS utilization.
15 (3) LOW-EARTH ORBIT.—NASA shall pursue a
16 step-wise transition of low-Earth orbit human
17 spaceflight operations from a Government-directed
18 activity to a model where private industry is respon-
19 sible for how to meet and execute NASA's require-
20 ments.
21 (4) TRANSITION REPORT.—NASA shall carry
22 out activities in fiscal year 2019 as proposed in the
23 ISS transition report, delivered pursuant to section
24 50111(c) of title 51, United States Code.

1 (d) REPORTING.—In addition to the biennial report-
2 ing requirement under section 50111(c) of title 51, United
3 States Code, the Administrator shall brief the Committee
4 on Science, Space, and Technology of the House of Rep-
5 resentatives and the Committee on Commerce, Science,
6 and Transportation of the Senate quarterly, beginning on
7 the date that is 3 months after the date of enactment of
8 this Act, on the status of, and all progress, changes, and
9 other developments related to carrying out the plans in
10 the ISS transition report.

11 (e) AUTHORIZED FUNDING.—Subject to the avail-
12 ability of appropriations, shall make available at least
13 $150,000,000 for fiscal year 2019 for commercial low-
14 Earth orbit development out of the LEO and Spaceflight
15 Operations account.

16 **SEC. 203. HUMAN SPACEFLIGHT RESEARCH.**

17 (a) SENSE OF CONGRESS.—It is the sense of Con-
18 gress that—

19 (1) the benefits derived from the peaceful use
20 of space depend on the extent to which ground-based
21 space infrastructure, facilities, and research are well-
22 integrated; and

23 (2) NASA Johnson Space Center (hereinafter
24 referred to as "JSC") has the expertise and facilities
25 to support the development of the major techno-

1 logical innovations necessary to enable and support
2 the nation's ongoing commitment to human
3 spaceflight, exploration, and continued human pres-
4 ence in space.
5 (b) JOHNSON SPACE CENTER RESEARCH OFFICE.—
6 (1) ESTABLISHMENT.—The Administrator shall
7 establish a research office at JSC to build upon the
8 Center's existing expertise in human space flight
9 missions for future challenges.
10 (2) RESEARCH DIRECTOR.—The head of the re-
11 search office shall be the research director, who shall
12 report directly to the Director of JSC.
13 (3) DUTIES.—The research director shall have,
14 at a minimum, the following duties:
15 (A) Oversee a research portfolio focused on
16 human space flight.
17 (B) Recommend infrastructure and equip-
18 ment necessary to carry out a research mission.
19 (C) Oversee professional development and
20 continuing education, as necessary and appro-
21 priate, for the civil workforce as the research
22 and innovation focus of the center increases.
23 (4) SCOPE OF RESEARCH.—The research office
24 shall focus on aspects of research that are directly
25 relevant to the endeavor of human space flight, in-

1 cluding problems of human spaceflight and robotics
2 supporting human space exploration.
3 (5) SUPPORT FOR HUMAN SPACEFLIGHT AC-
4 TIVITIES.—JSC shall, consistent with its primary re-
5 sponsibilities to NASA and other government cus-
6 tomers, endeavor to make the fullest possible use of
7 its facilities and infrastructure to support all U.S.
8 human spaceflight activities, including those of the
9 private sector.
10 (c) REPORT.—Not later than 180 days after the en-
11 actment of this Act, NASA and JSC shall submit to the
12 Committee on Science, Space, and Technology of the
13 House of Representatives and the Committee on Com-
14 merce, Science, and Transportation of the Senate a report
15 on NASA's progress on, and other developments related
16 to, carrying out the requirements of this section.
17 (d) AUTHORIZED FUNDING.—Subject to the avail-
18 ability of appropriations, the Administrator shall make
19 available at least $15,000,000 in fiscal year 2019 out of
20 the Exploration Research and Technology account to carry
21 out this section.
22 **SEC. 204. CRITICAL PATH REDUNDANCY FOR HUMAN**
23 **SPACEFLIGHT.**
24 (a) FINDINGS.—Congress finds that NASA, in co-
25 operation with private sector and international partners,

1 has facilitated the development of a wide array of cargo
2 and crew transportation options for operations in low-
3 Earth orbit and beyond.

4 (b) SENSE OF CONGRESS.—It is the sense of Con-
5 gress that the availability of a multitude of launch vehicles
6 and crew and cargo vehicles provides critical path redun-
7 dancy.

8 (c) LOGISTICAL AND TRANSPORT REDUNDANCY.—
9 Not later than 3 months after the date of the enactment
10 of this Act, the Administrator shall submit to the Com-
11 mittee on Commerce, Science, and Transportation of the
12 Senate and the Committee on Science, Space, and Tech-
13 nology of the House of Representatives a report that con-
14 tains an evaluation of the suitability and performance, in-
15 cluding cost, reliability, and availability, of—

16 (1) all available crew and cargo vehicles for des-
17 tinations in low-Earth orbit, cis-lunar space, and be-
18 yond; and

19 (2) all available launch vehicles that are capable
20 of delivering more than 20 tons to, or beyond, low-
21 Earth orbit to support exploration and scientific
22 missions, particularly to outer planets.

23 **SEC. 205. SPACE SUITS.**

24 (a) FINDINGS.—Congress finds the following:

1 (1) Space suits and associated extravehicular
2 activity (in this section, referred to as "EVA") tech-
3 nologies are critical space exploration technologies.
4 (2) The NASA civil service workforce at the
5 Johnson Space Center possesses unique capabilities
6 to integrate, design, and validate space suits and as-
7 sociated EVA technologies.
8 (3) Maintaining a strong core competency in
9 the design, development, manufacture, and operation
10 of space suits and related technologies allows NASA
11 to be an informed purchaser of competitively award-
12 ed commercial space suits and associated EVA tech-
13 nologies.
14 (4) NASA should fully utilize the International
15 Space Station by 2025 to test future space suits and
16 associated EVA technologies to reduce risk and im-
17 prove safety.
18 (b) SPACE SUITS.—
19 (1) IN GENERAL.—NASA shall develop space
20 suits and associated EVA technologies.
21 (2) MANAGEMENT.—The Johnson Space Center
22 shall manage the space suit and EVA programs of
23 NASA.
24 (3) PRIVATE SECTOR.—In carrying out this
25 subsection, the Administrator may enter into agree-

1 ments with the private sector as the Administrator
2 considers appropriate.

3 TITLE III—SCIENCE

4 Subtitle A—Earth Science

5 SEC. 301. REIMBURSABLE BASIS FOR DEVELOPMENT OF
6 SENSORS AND INSTRUMENTS.

7 Chapter 605 of title 51, United States Code, is
8 amended by adding at the end the following:

**9 "§ 60507. Reimbursable basis for development of sen-
10 sors and instruments**

11 "Any work undertaken by the Administration for the
12 benefit of another agency shall be conducted on a reim-
13 bursable basis that accounts for the full cost of the work,
14 including work undertaken for the development of oper-
15 ational Earth science systems, including satellite, sensor,
16 or instrument development, acquisition, and operations, as
17 well as product development and data analysis.".

18 (1) TECHNICAL AMENDMENT.—The table of
19 sections for chapter 605 of title 51, United States
20 Code, is amended by adding at the end the fol-
21 lowing:

"60507. Reimbursable basis for development of sensors and instruments.".

22 SEC. 302. EARTH OBSERVATIONS STUDY.

23 Section 702 of the National Aeronautics and Space
24 Administration Authorization Act of 2010 (42 U.S.C.
25 18371) is amended—

1 (1) by striking "The Director of" and inserting
2 the following:
3 "(a) IN GENERAL.—The Director of"; and
4 (2) by adding at the end the following:
5 "(b) CONSIDERATION.—In carrying out the strategic
6 implementation plan under subsection (a), the Director
7 shall take into account and incorporate into such plan, as
8 appropriate, purchasing Earth observation data and serv-
9 ices from the private sector or through public-private part-
10 nerships to meet Earth observation requirements.".
11 **SEC. 303. LAND IMAGING.**
12 (a) SENSE OF CONGRESS.—It is the sense of Con-
13 gress that—
14 (1) the continuous collection and utilization of
15 land remote sensing data from space are of major
16 benefit in studying and understanding human im-
17 pacts on the global environment, in managing the
18 Earth's natural resources, in carrying out national
19 security functions, and in planning and conducting
20 many other activities of scientific, economic, and so-
21 cial importance; and
22 (2) to the greatest extent practicable, the
23 United States should foster the development of U.S.
24 private sector remote sensing capabilities and anal-
25 yses that can satisfy the public interest in long-term

1 continuous collection of medium-resolution land re-
2 mote sensing data.
3 (b) CONTINUOUS LAND REMOTE SENSING DATA
4 COLLECTION.—
5 (1) IN GENERAL.—Subchapter IV of chapter
6 601 of title 51, United States Code, is amended by
7 adding at the end the following new section:
8 **"§ 60135. Continuous land remote sensing data collec-**
9 **tion**
10 "(a) POLICY.—It is the policy of the United States
11 to—
12 "(1) ensure, to the greatest extent practicable,
13 the continuous collection of space-based, medium-
14 resolution observations of the Earth's land cover;
15 "(2) ensure that the collected data are made
16 available in such ways as to facilitate the widest pos-
17 sible use; and
18 "(3) to the greatest extent practicable, foster
19 the development of U.S. private sector remote sens-
20 ing capabilities and analyses that can satisfy the
21 public interest in long-term continuous collection of
22 medium-resolution land remote sensing data.
23 "(b) COORDINATION.—The National Space Council,
24 in consultation with other relevant Federal agencies, shall

1 coordinate United States Government activities described
2 under paragraphs (1) through (3) of subsection (a).".
3 (2) CONFORMING AMENDMENT.—The table of
4 sections for subchapter IV of chapter 601 of title 51,
5 United States Code, is amended by adding at the
6 end the following new section:

"60135. Continuous land remote sensing data collection.".

7 **SEC. 304. LANDSAT DATA POLICY.**
8 (a) IN GENERAL.—
9 (1) LIMITATION ON USE OF FUNDS.—No funds
10 may be obligated or expended for Landsat 11 or any
11 other subsequent Landsat system until the Adminis-
12 trator has completed a study assessing which aspects
13 of Landsat system observations and associated
14 science requirements can be provided by purchasing
15 data from the private sector or through public-pri-
16 vate partnerships.
17 (2) REPORT.—Not later than 1 year after the
18 date of enactment of this Act, the Administrator
19 shall transmit to the Committee on Science, Space,
20 and Technology of the House of Representatives and
21 the Committee on Commerce, Science, and Trans-
22 portation of the Senate, a report containing the re-
23 sults of the study required under paragraph (1).

1 (b) DEFINITION OF LANDSAT SYSTEM.—In this sec-
2 tion, the term "Landsat system" has the meaning given
3 that term in section 60101 of title 51, United States Code.

4 **SEC. 305. EARTH SCIENCE MISSIONS.**

5 The Administrator shall continue to restructure the
6 Earth science portfolio of NASA to reduce overall costs,
7 support innovative and sustainable programs and missions
8 with commercial and international partners, and align
9 with the recommendations of the National Academy of
10 Sciences included in the publication published in 2018 ti-
11 tled "Thriving on Our Changing Planet: A Decadal Strat-
12 egy for Earth Observation from Space" to ensure that the
13 Earth science portfolio is focused on the highest priority
14 missions for the science and applications communities
15 within a balanced, comprehensive Earth science program.

16 **SEC. 306. GODDARD INSTITUTE FOR SPACE STUDIES IN-**
17 **SPECTOR GENERAL REPORT.**

18 Not later than 180 days after the date of enactment
19 of this Act, the Administrator shall transmit to the Com-
20 mittee on Science, Space, and Technology of the House
21 of Representatives and the Committee on Commerce,
22 Science, and Transportation of the Senate, a report con-
23 taining the results of NASA's implementation of the rec-
24 ommendations identified in the report published by the
25 NASA Office of Inspector General on April 5, 2018, titled

1 "NASA's Management GISS: The Goddard Institute for
2 Space Studies".

3 Subtitle B—Astronomy and
4 Astrophysics

**5 SEC. 311. SEARCH FOR THE ORIGIN, EVOLUTION, DISTRIBU-
6 TION, AND FUTURE OF LIFE IN THE UNI-
7 VERSE.**

8 (a) POLICY.—Section 20102(d)(10) of title 51,
9 United States Code, includes the search for life's origin,
10 evolution, distribution, and future in the universe as an
11 objective of U.S. aeronautical and space activities.

12 (b) IN GENERAL.—NASA shall partner with the pri-
13 vate sector and philanthropic organizations to the max-
14 imum extent practicable to search for technosignatures,
15 such as radio transmissions, in order to meet the NASA
16 objective to search for life's origin, evolution, distribution,
17 and future in the universe.

18 (c) REPORT.—Not later than 90 days after the date
19 of enactment of this Act, the Administrator shall submit
20 to the Committee on Science, Space, and Technology of
21 the House of Representatives and the Committee on Com-
22 merce, Science, and Transportation of the Senate a report,
23 produced in consultation with industry and academia, on
24 all NASA programs, including partnerships with the pri-
25 vate sector and philanthropic organizations, that con-

1 tribute to the search for life's origin, evolution, distribu-
2 tion, and future in the universe.

3 (d) AUTHORIZED FUNDING.—Subject to the avail-
4 ability of appropriations, the Administrator shall make
5 available at least $10,000,000 for each of fiscal years
6 2018 and 2019 for the search for technosignatures.

7 **SEC. 312. WIDE-FIELD INFRARED SPACE TELESCOPE.**

8 (a) FINDINGS.—Congress finds the following:

9 (1) Concurrent flagship programs challenge sig-
10 nificantly NASA's program management capacity,
11 especially during later stages of the program man-
12 agement process.

13 (2) The Wide-Field Infrared Space Telescope
14 (hereinafter referred to as "WFIRST") was can-
15 celled in the President's fiscal year 2019 budget re-
16 quest.

17 (3) WFIRST was funded in the amount of
18 $150,000,000 in NASA's appropriation for fiscal
19 year 2018.

20 (4) Pursuant to direction in NASA's appropria-
21 tion for fiscal year 2018, NASA is conducting a pre-
22 liminary life-cycle cost estimate, including any addi-
23 tions needed to achieve Class A classification, along
24 with a year-by-year breakout of development costs.

1 (5) Until such preliminary life-cycle cost esti-
2 mate is complete, Congress has insufficient informa-
3 tion to judge whether or not WFIRST should be au-
4 thorized to proceed in fiscal year 2019.
5 (b) TOTAL COST.—The total formulation and devel-
6 opment cost, as such term is defined in section 30104 of
7 title 51, United States Code, for the Wide-Field Infrared
8 Space Telescope shall not exceed $3,200,000,000.
9 (c) BUDGET.—The Administrator shall include in the
10 budget for fiscal year 2020 a 5-year funding profile nec-
11 essary to achieve the goal in subsection (b).
12 (d) LIMITATION.—The Administrator shall not pro-
13 cure a launch vehicle for the Wide-Field Infrared Space
14 Telescope until the James Webb Space Telescope is oper-
15 ational in space.

16 **Subtitle C—Planetary Science**

17 **SEC. 321. NEAR-EARTH OBJECT SURVEY.**

18 (a) FINDINGS.—Congress finds the following:
19 (1) The George E. Brown, Jr. Near-Earth Ob-
20 ject Survey Act (Public Law 109–155) established
21 the Near-Earth Object Survey program to detect,
22 track, and catalogue the physical characteristics of
23 near-Earth objects equal to or greater than 140 me-
24 ters in diameter in order to assess the threat of such
25 objects to Earth.

1 (2) The goal of the Survey program is to
2 achieve 90 percent completion of the near-Earth
3 project catalogue (based on statistically predicted
4 populations of near-Earth objects) not later than 15
5 years after the date of the enactment of the George
6 E. Brown, Jr. Near-Earth Object Survey Act.
7 (3) NASA has been successful finding more
8 than 90 percent of the near-Earth asteroids larger
9 than one kilometer but has only found about 30 per-
10 cent of the near-Earth objects larger than 140 me-
11 ters.
12 (4) The vast majority of near-Earth object dis-
13 coveries have been made by NASA-supported
14 ground-based telescopic surveys.
15 (b) SENSE OF CONGRESS.—It is the sense of Con-
16 gress that—
17 (1) in order to meet the statutory requirements
18 of the George E Brown, Jr. Near-Earth Object Sur-
19 vey Act (Public Law 109–155), a space-based tele-
20 scope mission should be fully funded and supported
21 by NASA and carried out by the Planetary Defense
22 Coordination Office; and
23 (2) the space-based telescope Near-Earth Ob-
24 ject Camera mission, or a similar infrared telescope
25 concept optimized for near-Earth object search and

1 characterization, could discover and characterize
2 most of the potentially hazardous asteroids that are
3 near the Earth.

4 **SEC. 322. SPACE NUCLEAR POWER.**

5 (a) FINDING.—Congress finds that in-space nuclear
6 fission power complements the use of Plutonium-238 radi-
7 oisotope thermoelectric generators (in this section referred
8 to as "RTG") for spacecraft power needs.

9 (b) POLICY.—It is the policy of the United States—
10 (1) to continue the development of in-space nu-
11 clear fission technology, as necessary, for purposes
12 including—
13 (A) in-space power generation for advanced
14 in-space propulsion;
15 (B) onboard power generation to replace or
16 supplement RTG systems;
17 (C) power generation on the surface of ce-
18 lestial bodies;
19 (D) extraction and processing of in situ re-
20 sources; and
21 (E) nuclear thermal and nuclear electric
22 propulsion able to transport crew or cargo
23 among Earth and other celestial bodies much
24 more rapidly than is practical with non-nuclear
25 systems;

1 (2) that research and development of in-space
2 nuclear fission power should be carried out as part
3 of a portfolio that appropriately balances develop-
4 ment of power systems at different sizes and matu-
5 rities, with an emphasis on early development of ma-
6 ture, operational systems; and
7 (3) that NASA should continually seek to
8 streamline the process for space launch approval of
9 nuclear materials, eliminate redundant and
10 unneeded processes, and regularize the process for
11 efficient, regular functioning, and toward that end,
12 the Administrator should update the launch approval
13 process and seek to establish a licensing process for
14 private nuclear power sources in space.
15 (c) SPACE NUCLEAR POWER REPORT.—
16 (1) IN GENERAL.—Not later than 180 days
17 after the date of enactment of this Act, the Admini-
18 trator shall submit to the Committee on Science,
19 Space, and Technology of the House of Representa-
20 tives and the Committee on Commerce, Science, and
21 Transportation of the Senate a report, produced in
22 consultation with industry and academia, on the use
23 and role of nuclear fission power in space.
24 (2) CONTENTS.—The report required under
25 paragraph (1) shall include—

1 (A) an assessment of the prospects for in-
2 space nuclear fission reactors, describing par-
3 ticular roles and missions for which nuclear
4 power is uniquely well-suited;
5 (B) a description of the convergence be-
6 tween NASA's existing Plutonium-238 RTG
7 programs and ongoing nuclear thermal propul-
8 sion and nuclear power generation development
9 programs;
10 (C) a detailed plan for encouraging conver-
11 gence between NASA's various nuclear power
12 and propulsion efforts;
13 (D) an identification of key infrastructure
14 and facilities needed for the development of in-
15 space nuclear fission power reactors;
16 (E) an identification of particular legal
17 issues, including regulatory challenges, that
18 must be addressed for the use of nuclear fission
19 power systems;
20 (F) how small in-space nuclear fission re-
21 actors can complement or replace existing and
22 planned radioisotope thermal generator capa-
23 bilities; and

1 (G) information on very low cost, high reli-
2 ability designs that can be made operational
3 quickly.
4 (d) DEMONSTRATION.—NASA should demonstrate a
5 nuclear electric power reactor for use in space using exist-
6 ing authorized funding levels and within a schedule made
7 possible by appropriated funding.

8 TITLE IV—AERONAUTICS

9 **SEC. 401. SUPERSONIC RESEARCH.**

10 (a) POLICY.—It is the policy of the United States to
11 reduce Government barriers to the development of civil su-
12 personic transportation.
13 (b) RESEARCH.—Section 40112(a) of title 51, United
14 States Code, is amended—
15 (1) by striking "The Administrator" and insert-
16 ing the following:
17 "(1) IN GENERAL.—The Administrator"; and
18 (2) by adding at the end the following:
19 "(2) RESEARCH.—The Administrator, in con-
20 sultation with the Administrator of the Federal
21 Aviation Administration, shall undertake research on
22 supersonic transport to inform and accelerate the
23 promulgation of domestic regulations and inter-
24 national standards and recommended practices that

1 will open up the U.S. civil airspace to civil super-
2 sonic transport.".

3 **SEC. 402. UNMANNED AIRCRAFT SYSTEMS RESEARCH.**

4 (a) IN GENERAL.—

5 (1) TITLE 51.—Chapter 315 of title 51, United
6 States Code, is amended by adding at the end the
7 following:

8 **"§ 31506. Unmanned aircraft systems research**

9 "The Administrator, in consultation with the Admin-
10 istrator of the Federal Aviation Administration and other
11 Federal agencies, shall conduct research on facilitating the
12 safe integration of unmanned aircraft systems into the na-
13 tional airspace system, including—

14 "(1) positioning and navigation systems;

15 "(2) sense-and-avoid capabilities;

16 "(3) secure data and communication links;

17 "(4) flight recovery systems; and

18 "(5) human systems integration.".

19 (2) CONFORMING AMENDMENT.—The table of
20 sections for chapter 315 of title 51, United States
21 Code, is amended by adding at the end the following
22 new item:

"31506. Unmanned aircraft systems research.".

23 (b) COOPERATIVE UNMANNED AERIAL VEHICLE AC-
24 TIVITIES.—Section 31504 of title 51, United States Code,
25 is amended by adding at the end the following: "Oper-

1 ational flight data derived from such cooperative agree-
2 ments shall be made available, in appropriate and usable
3 formats, to the Administration and the Federal Aviation
4 Administration for the development of regulatory stand-
5 ards.".

6 **SEC. 403. 21ST CENTURY AERONAUTICS RESEARCH CAPA-**
7 **BILITIES INITIATIVE.**

8 (a) ESTABLISHMENT.—The Administrator shall es-
9 tablish an initiative to be known as the 21st Century Aero-
10 nautics Research Capabilities Initiative, funded through
11 the Construction of Facilities account, to ensure that
12 NASA possesses the infrastructure capabilities and com-
13 putational tools necessary to conduct flight demonstration
14 projects across the range of NASA aeronautics interests.

15 (b) ACTIVITIES.—In carrying out the 21st Century
16 Aeronautics Research Capabilities Initiative, the Adminis-
17 trator shall—

18 (1) upgrade and create facilities for civil and
19 national security aeronautics research; and

20 (2) support flight testing activities.

21 (c) OPERATING MODEL.—In carrying out the 21st
22 Century Aeronautics Research Capabilities Initiative, the
23 Administrator shall, to the greatest extent practicable,
24 build on NASA's work on developing its Operating Model

1 and the results of the Technical Capabilities Assessment
2 Team.
3 (d) REPORT.—
4 (1) REPORT REQUIRED.—Not later than 120
5 days after the date of enactment of this Act, the Ad-
6 ministrator shall submit to the Committee on
7 Science, Space, and Technology of the House of
8 Representatives and the Committee on Commerce,
9 Science, and Transportation of the Senate a report
10 containing a 5-year plan for the implementation of
11 the 21st Century Aeronautics Research Capabilities
12 Initiative.
13 (2) ELEMENTS.—The report required under
14 this subsection shall include—
15 (A) a description of proposed projects;
16 (B) a description of how the projects align
17 with the Aeronautics Strategic Implementation
18 Plan; and
19 (C) a timetable for carrying out activities
20 and initiatives authorized under this section.
21 (e) AUTHORIZATION OF APPROPRIATIONS.—There
22 are authorized to be appropriated $50,000,000, funded
23 through the Construction of Facilities account, for fiscal
24 year 2019 to carry out this section.

1 **SEC. 404. EXPERIMENTAL PLANE PROGRAM.**

2 (a) POLICY.—It is the policy of the United States to
3 maintain the role of the United States as a world leader
4 in aeronautical science and technology.

5 (b) OBJECTIVE.—A fundamental objective of NASA
6 aeronautics research is the steady progression and expan-
7 sion of high-speed flight research and capabilities, includ-
8 ing the science and technology of critical underlying dis-
9 ciplines and competencies, the most important of which
10 are computational-based analytical and predictive tools
11 and methodologies, aero thermodynamics, high-speed
12 flight propulsion, high-temperature structures and mate-
13 rials, and flight controls.

14 **SEC. 405. HYPERSONIC TECHNOLOGY PROJECT.**

15 (a) FINDINGS.—Congress finds that—

16 (1) the development of new hypersonic flight
17 technologies is important to the United States;

18 (2) though hypersonic flight technologies are
19 likely to be applied to enhance defense systems in
20 the near-term, in the long-term, application of such
21 technologies may expand to include improved access-
22 to-space capabilities that benefit NASA; and

23 (3) NASA maintains specialized facilities and
24 experts who will focus on research areas that explore
25 challenges in hypersonic flight.

1 (b) POLICY.—In carrying out the Hypersonic Tech-
2 nology project, NASA should focus research and develop-
3 ment efforts on high-speed propulsion systems, reusable
4 vehicle technologies, high-temperature materials, and sys-
5 tems analysis.

6 (c) AUTHORIZED FUNDING.—Subject to the avail-
7 ability of appropriations, the Administrator shall make
8 available at least $30,000,000 for fiscal year 2019 for the
9 Hypersonic Technology project.

10 TITLE V—COMMERCIAL

11 **SEC. 501. COMMERCIAL SUPPLY OF SPACE PRODUCTS.**

12 (a) IN GENERAL.—Subchapter II of chapter 501 of
13 title 51, United States Code, is amended by adding at the
14 end the following:

15 **"§ 50117. Commercial supply of space products**

16 "(a) IN GENERAL.—In planning and carrying out
17 space exploration missions, the Administrator shall, to the
18 greatest extent practicable, prioritize the acquisition and
19 use of space products provided by a United States com-
20 mercial provider or through a public-private partnership
21 with a United States commercial provider.

22 "(b) SPACE PRODUCT DEFINED.—In this section, the
23 term 'space product' means a tangible good, including a
24 finished good, or commodity, including a propellant, water,
25 oxygen, or gas, that—

"(1) is required for space exploration activities; and

"(2) originates in outer space.

"(c) COMMODITIES USED IN SPACE.—

"(1) LIST OF COMMODITIES.—In planning a space exploration mission, the Administrator shall create a list of commodities to be used during such mission. The list shall include specification of each commodity, anticipated quantity, and the location and the timeframe of need.

"(2) COMMODITY COST BASIS.—For each commodity listed pursuant paragraph (1), NASA shall establish a commodity cost basis that shall represent the lesser of—

"(A) the estimated cost to procure the commodity on Earth and deliver the commodity to the location of use; and

"(B) the estimated cost for the Government to procure the equivalent commodity that is a space product.

"(3) PUBLICATION.—The Administrator shall annually publish the information compiled under paragraphs (1) and (2) during the previous calendar year.

1 "(d) EXCEPTIONS.—The Administrator shall not be
2 required to prioritize the acquisition of space products for
3 the purposes described in subsection (a) if, on a case-by-
4 case basis—
5 "(1) the Administrator determines that—
6 "(A) cost-effective space products that
7 meet specific mission requirements would not be
8 reasonably available from United States com-
9 mercial providers when required;
10 "(B) the use of space products from
11 United States commercial providers poses an
12 unacceptable mission risk; or
13 "(C) the use of space products is incon-
14 sistent with international agreements for inter-
15 national collaborative efforts relating to science
16 and technology; or
17 "(2) the Secretary of the Air Force determines
18 that the use of space commodities from United
19 States commercial providers is inconsistent with na-
20 tional security objectives.
21 "(e) AGREEMENTS WITH FOREIGN ENTITIES.—
22 Nothing in this section shall prevent the Administrator
23 from planning or negotiating agreements with foreign gov-
24 ernmental entities for the provision of space products.".

1 (b) CONFORMING AMENDMENT.—Subchapter II of
2 chapter 501 of title 51, United States Code, is amended
3 by adding at the end the following:

"50117. Commercial supply of space products.".

4 **SEC. 502. COMMERCIAL PROVISION OF SERVICES.**

5 (a) IN GENERAL.—Subchapter II of chapter 501 of
6 title 51, United States Code, is further amended by adding
7 at the end the following:

8 **"§ 50118. Commercial provision of services**

9 "(a) IN GENERAL.—In planning and carrying out
10 space exploration missions, the Administrator shall, to the
11 greatest extent practicable, acquire services to be carried
12 out in outer space by a United States commercial provider
13 or through a public-private partnership with a United
14 States commercial provider to support such missions.

15 "(b) EXCEPTIONS.—The Administrator shall not be
16 required to acquire services under subsection (a) from a
17 United States commercial provider or through a public-
18 private partnership with a United States commercial pro-
19 vider if, on a case-by-case basis—

20 "(1) the Administrator determines that—

21 "(A) cost-effective services that meet spe-
22 cific mission requirements would not be reason-
23 ably available from United States commercial
24 providers when required;

1 "(B) the use of such services from United
2 States commercial providers poses an unacceptable mission risk; or
4 "(C) the use of such services is inconsistent with international agreements for international collaborative efforts relating to science and technology; or
8 "(2) the Secretary of the Air Force determines that the use of services from United States commercial providers is inconsistent with national security objectives.
12 "(c) AGREEMENTS WITH FOREIGN ENTITIES.—Nothing in this section shall prevent the Administrator from planning or negotiating agreements with foreign governmental entities for the provision of support services to be carried out in outer space.".
17 (b) CONFORMING AMENDMENT.—Subchapter II of chapter 501 of title 51, United States Code, is further amended by adding at the end the following:

"50118. Commercial provision of services.".

20 **SEC. 503. COMMERCIAL IN-SPACE INFRASTRUCTURE.**

21 (a) IN GENERAL.—Subchapter II of chapter 501 of title 51, United States Code, is further amended by adding at the end the following:

1 **"§ 50119. Commercial in-space infrastructure**

2 "(a) IN GENERAL.—In planning and carrying out
3 space exploration missions, the Administrator shall, to the
4 greatest extent practicable, make use of commercial in-
5 space infrastructure to support such missions.

6 "(b) COMMERCIAL IN-SPACE INFRASTRUCTURE.—In
7 this section, the term 'commercial in-space infrastructure'
8 means infrastructure that is—

9 "(1) owned, managed, or built by a United
10 States commercial provider or through a public-pri-
11 vate partnership with a United States commercial
12 provider; and

13 "(2) located more than 320,000 kilometers
14 from the Earth's surface.

15 "(c) EXCEPTIONS.—The Administrator shall not be
16 required to use commercial in-space infrastructure if, on
17 a case-by-case basis—

18 "(1) the Administrator determines that—

19 "(A) cost-effective infrastructure that
20 meets specific mission requirements would not
21 be reasonably available from United States
22 commercial providers when required;

23 "(B) the use of commercial in-space infra-
24 structure poses an unacceptable mission risk; or

25 "(C) the use of commercial in-space infra-
26 structure is inconsistent with international

1 agreements for international collaborative ef-
2 forts relating to science and technology; or
3 "(2) the Secretary of the Air Force determines
4 that the use of commercial in-space infrastructure is
5 inconsistent with national security objectives.
6 "(d) AGREEMENTS WITH FOREIGN ENTITIES.—
7 Nothing in this section shall prevent the Administrator
8 from planning or negotiating agreements with foreign gov-
9 ernmental entities for the use infrastructure in support
10 of United States civil government activities in outer
11 space.".
12 (b) CONFORMING AMENDMENT.—Subchapter II of
13 chapter 501 of title 51, United States Code, is further
14 amended by adding at the end the following:

"50119. Commercial in-space infrastructure.".

15 **SEC. 504. PREFERENCE FOR LAUNCH VEHICLES MANUFAC-**
16 **TURED IN THE UNITED STATES.**

17 It is the sense of Congress that the Administrator
18 should, to the greatest extent possible, with respect to en-
19 tering into contracts for commercial space data and serv-
20 ices, provide weighed preference, selection points, and
21 other incentives for the use of launch vehicles that are
22 manufactured in the United States.

23 **SEC. 505. STUDIES ON INDUSTRIAL BASE.**

24 No funds may be obligated or expended by the Ad-
25 ministrator for purposes of carrying out a Bureau of In-

1 dustry and Security survey of the United States aerospace
2 industrial base until the date that is 30 days after the
3 date on which the Administrator submits to the Com-
4 mittee on Science, Space, and Technology of the House
5 of Representatives and the Committee on Commerce,
6 Science, and Transportation of the Senate a written notifi-
7 cation that includes—
8 (1) the proposed subject matter of such survey;
9 (2) a description of the information to be re-
10 quired of survey respondents; and
11 (3) any penalties proposed to be assessed by the
12 Federal Government against respondents for non-
13 compliance with survey requirements.

14 **SEC. 506. SPECTRUM COORDINATION.**

15 (a) IN GENERAL.—The Administrator shall develop
16 and implement a plan to more effectively and efficiently,
17 taking into account NASA's spectrum requirements, share
18 electromagnetic spectrum assigned to NASA with United
19 States nongovernmental entities operating or proposing to
20 operate space objects.
21 (b) REPORT.—Not later than 180 days after the date
22 of enactment of this Act, the Administrator shall submit
23 to the Committee on Science, Space, and Technology of
24 the House of Representatives and the Committee on Com-

1 merce, Science, and Transportation of the Senate a report
2 on the plan developed under subsection (a).

3 **SEC. 507. ENHANCED-USE LEASING.**

4 (a) SENSE OF CONGRESS.—It is the sense of Con-
5 gress that—

6 (1) NASA possesses a variety of unique and
7 world-class facilities;

8 (2) NASA is developing and using many dif-
9 ferent methods to offset the cost of maintaining and
10 operating such facilities;

11 (3) nongovernmental entities may be able to use
12 such facilities in a manner that is cost-effective; and

13 (4) agreements between NASA and nongovern-
14 mental entities regarding the use of such facilities
15 may offset a portion of the spending of NASA.

16 (b) EXTENSION OF AUTHORITY TO LEASE NON-EX-
17 CESS PROPERTY.—Section 20145(g) of title 51, United
18 States Code, is amended by striking "December 31, 2018"
19 and inserting "December 31, 2020".

20 (c) CONDITION ON USE OF FUNDS.—For any year
21 for which funds are made available under section 20145
22 of title 51, United States Code, (as amended by subsection
23 (b)), no funds may be expended by the Administrator
24 under such section after January 31 unless Administrator
25 submits, before such date, to the Committee on Science,

1 Space, and Technology of the House of Representatives
2 and the Committee on Commerce, Science, and Transpor-
3 tation of the Senate the annual report required under such
4 section for the prior year.

5 **SEC. 508. SATELLITE SERVICING TECHNOLOGIES.**

6 The Administrator shall continue to restructure
7 NASA investments in the development of satellite serv-
8 icing technologies to reduce the overall cost to NASA and
9 align with NASA needs for exploration.

10 TITLE VI—POLICY

11 **SEC. 601. NASA-FUNDED INSTITUTES.**

12 (a) FINDINGS.—Congress finds that on June 9,
13 2016, the Office of Inspector General of NASA reported
14 that—

15 (1) NASA does not aggregate information on
16 the universe, status, or funding levels for the many
17 institutes it supports;

18 (2) the absence of this information makes it dif-
19 ficult for NASA leaders to strategically evaluate the
20 scope or purpose of its institute investments and for
21 Congress and other stakeholders to understand how
22 NASA is spending more than three-quarters of a bil-
23 lion dollars of its budget annually;

1 (3) absent comprehensive, centralized informa-
2 tion about these investments, it may be difficult for
3 NASA to avoid duplication among its efforts;
4 (4) NASA has not defined what constitutes an
5 institute or established guidance and metrics on the
6 management, use, or expectations for return on in-
7 vestment;
8 (5) such guidance may enable NASA to gain a
9 better understanding of how funds directed to
10 NASA-funded institutes are utilized to accomplish
11 the mission and goals of NASA, increase its return
12 on investment, and evaluate the performance of such
13 institutes; and
14 (6) NASA lacks a standard process to assess a
15 potential grantee's financial condition prior to grant
16 award or to impose additional reporting or oversight
17 requirements that such a condition may warrant,
18 and without such a mechanism, NASA risks making
19 uninformed investment decisions.
20 (b) INSTITUTE BUDGETS.—Section 30103(a) of title
21 51, United States Code, is amended—
22 (1) in paragraph (5), by striking "and" at the
23 end;
24 (2) by redesignating paragraph (6) as para-
25 graph (7); and

1 (3) by inserting after paragraph (5) the fol-
2 lowing:
3 "(6) the budget for each NASA-funded insti-
4 tute; and".
5 (c) REPORT.—Not later than 90 days after the date
6 of enactment of this Act, the Administrator shall submit
7 to the Committee on Science, Space, and Technology of
8 the House of Representatives and the Committee on Com-
9 merce, Science, and Transportation of the Senate a report
10 that recommends guidance and metrics for the manage-
11 ment, utilization, expectations for return on investment,
12 and financial condition of NASA-funded institutes.
13 **SEC. 602. BASELINE AND COST CONTROLS.**
14 Section 30104(e)(1)(A) of title 51, United States
15 Code, is amended—
16 (1) in clause (ii) by striking "and" at the end;
17 (2) in clause (iii) by striking "and" at the end;
18 and
19 (3) by adding at the end the following:
20 "(iv) any changes made in the per-
21 formance or schedule milestones and the
22 degree to which such changes have contrib-
23 uted to the increase in total cost;
24 "(v) new estimates of the specific
25 project or specific program cost; and

"(vi) a statement validating that the management structure of the project or program is adequate to control cost; and".

SEC. 603. REPORTS TO CONGRESS.

(a) IN GENERAL.—Chapter 301 of title 51, United States Code, is amended by adding at the end the following:

"§ 30105. Concurrent reports

"For any report that the Administration submits to the Committee on Appropriations of the House of Representatives or the Committee on Appropriations of the Senate, the Administrator shall concurrently submit such report to the Committee on Science, Space, and Technology of the House of Representatives and the Commerce, Science, and Transportation Committee of the Senate.".

(b) CONFORMING AMENDMENT.—The table of sections for chapter 301 of title 51, United States Code, is amended by adding at the end the following:

"30105. Concurrent reports.".

SEC. 604. INTERNATIONAL TECHNICAL AND OPERATIONAL STANDARDS.

(a) FINDINGS.—Congress finds that—

(1) section 71301 of title 51, United States Code, directs the Administrator to "enter into discussions with the appropriate representatives of

1 spacefaring nations who have or plan to have crew
2 transportation systems capable of orbital flight or
3 flight beyond low Earth orbit for the purpose of
4 agreeing on a common docking system standard";
5 (2) the development of an international docking
6 standard has been beneficial in promoting Govern-
7 ment and private sector space exploration, interoper-
8 ability, and United States international leadership;
9 (3) NASA continues the development described
10 in paragraph (2) by coordinating the development of
11 joint international deep space interoperability stand-
12 ards; and
13 (4) the long-term goals of NASA, as described
14 in section 202(a) of the National Aeronautics and
15 Space Administration Authorization Act of 2010 (42
16 U.S.C. 18312(a)), include expanding permanent
17 human presence beyond low-Earth orbit.
18 (b) SENSE OF CONGRESS.—It is the sense of Con-
19 gress that—
20 (1) the plans of NASA for crewed exploration
21 beyond low-Earth orbit should involve a wide array
22 of partners to address the technological challenges of
23 deep space exploration;
24 (2) the development of common terminology
25 and concepts for spacecraft design and safety will

1 help promote NASA leadership in space and space-
2 craft design;
3 (3) the adoption of common design and safety
4 terminology and concepts across NASA would enable
5 NASA to pursue the long-term goals of NASA, de-
6 scribed in section 202(a) of the National Aero-
7 nautics and Space Administration Authorization Act
8 of 2010 (42 U.S.C. 18312(a)), in a manner that is
9 effective and efficient; and
10 (4) NASA should continue to develop and pro-
11 mote common terminology and concepts for space-
12 craft design and safety.

13 **SEC. 605. NASA CONTRACTOR RESPONSIBILITY WATCH**
14 **LIST.**

15 (a) IN GENERAL.—The Administrator shall establish
16 and maintain a watch list of contractors with a history
17 of poor performance on space procurement contracts or
18 research, development, test, and evaluation space program
19 contracts.
20 (b) BASIS FOR INCLUSION ON LIST.—
21 (1) DETERMINATION.—The Administrator may
22 place a contractor, including parties contracting
23 under other transaction authorities, on the watch list
24 established under subsection (a) upon determining
25 that the ability of the contractor to perform a con-

1 tract specified in such subsection is uncertain be-
2 cause of any of the following:
3 (A) Poor performance or award fee scores
4 below 50 percent.
5 (B) Financial concerns.
6 (C) Felony convictions or civil judgements.
7 (D) Security or foreign ownership and con-
8 trol issues.
9 (2) DISCRETION OF THE ADMINISTRATOR.—
10 The Administrator shall be responsible for deter-
11 mining which contractors to place on the watch list,
12 whether an entire company or a specific division
13 should be included, and when to remove a contractor
14 from the list.
15 (c) EFFECT OF LISTING.—
16 (1) PRIME CONTRACTS.—NASA may not solicit
17 an offer from, award a contract to, execute an engi-
18 neering change proposal with, or exercise an option
19 on any program of NASA with a contractor included
20 on the list established under subsection (a) without
21 the prior direct approval of the Administrator.
22 (2) SUBCONTRACTS.—A prime contractor on a
23 contract entered into with NASA may not enter into
24 a subcontract valued in excess of $3,000,000 or five
25 percent of the prime contract value, whichever is

1 lesser, with a contractor included on the watch list
2 established under subsection (a) without the prior
3 approval of the Administrator.
4 (d) REQUEST FOR REMOVAL FROM LIST.—A con-
5 tractor may submit to the Administrator a written request
6 for removal from the watch list, including evidence that
7 the contractor has resolved the issue that was the basis
8 for inclusion on the list.
9 (e) RULE OF CONSTRUCTION.—Nothing in this sec-
10 tion shall be construed as preventing the suspension or
11 debarment of a contractor, but inclusion on the watch list
12 shall not be construed as a punitive measure or de facto
13 suspension or debarment of a contractor.
14 **SEC. 606. HUMAN SPACE EXPLORATION RISK.**
15 (a) FINDINGS.—Congress finds the following:
16 (1) American leadership in the peaceful explo-
17 ration and use of outer space has been a long-stand-
18 ing priority for the United States.
19 (2) The reestablishment of the National Space
20 Council by President Trump demonstrates the stra-
21 tegic importance of outer space to the Nation.
22 (3) The December 2017 National Security
23 Strategy of the United States establishes the broad
24 strategic importance of outer space exploration and
25 use for the United States.

1 (b) SENSE OF CONGRESS.—It is the sense of Con-
2 gress that—
3 (1) exploration and use of outer space is a mat-
4 ter of broad, national strategic importance; and
5 (2) space exploration decision-making and re-
6 quirement-setting in such a strategic context is com-
7 plex, especially with respect to setting appropriate
8 priorities and levels of risk tolerance.
9 (c) REPORT ON INHERENT JUSTIFIABLE RISK.—
10 (1) IN GENERAL.—Not later than 1 year after
11 the date of enactment of this Act, the National
12 Space Council, or its designee, shall submit to Con-
13 gress and make available to the public a report re-
14 lating the broad strategic national importance of
15 space to the inherent, justifiable risk of the explo-
16 ration and use of space.
17 (2) POLICY AND STRATEGY.—The Adminis-
18 trator shall engage with appropriate members of the
19 private sector, academia, and nonprofit organiza-
20 tions on a policy and strategy of enterprise-level en-
21 gineering and operational risk management to
22 present in the report that addresses inherent, justifi-
23 able risks of loss of life that may occur in space ex-
24 ploration and use.

1 (3) CONTENTS.—The report required under
2 paragraph (1) shall—
3 (A) clarify the broad strategic case and
4 value of space;
5 (B) address inherent, justifiable risks of
6 loss of life that may occur in space exploration
7 and use; and
8 (C) discuss enterprise- and architecture-
9 level approaches for exploration risk manage-
10 ment.

AMENDMENT TO H.R. 5503

OFFERED BY M__. _____

Page 3, strike lines 13 through 16 (and redesignate accordingly).

Page 5, line 14, insert ", including $350,000,000 for a second mobile launch platform and associated Space Launch System activities" after "Systems".

Page 5, line 19, strike "Experimental" and insert "Established".

Page 6, line 11, strike "$2,150,000,000" and insert "$1,350,000,000".

Page 6, line 14, strike "$1,350,000,000" and insert "$2,150,000,000".

Page 8, line 15, strike "Space Grant" and insert "National Space Grant College and Fellowship Program".

Page 9, line 21, strike "an".

Page, 9, line 23, strike "could" and insert "can".

Page 10, line 15, strike "valuable".

Page 10, after line 19, insert the following (and redesignate accordingly):

1 (3) In addition to the priorities under para-
2 graph (2), the United States has a larger and broad-
3 er need and use for further microgravity research.

Page 12, line 3, insert "the" after "support".

Page 12, line 5, insert "on" before "surfaces".

Page 12, line 10, strike "International Space Station" and insert "ISS".

Page 13, line 7, strike "3 months" and insert "90 days".

Page 13, line 12, insert "the Administrator" before "shall make available".

Page 13, line 14, strike "LEO" and insert "Low Earth Orbit".

Page 13, after line 18, insert the following (and redesignate accordingly):

4 (1) in line with the National Space Council Pol-
5 icy Directive 1, as implemented by the President's
6 memo of December 11, 2017, the United States
7 should lead the return of humans to the Moon for

1 long-term exploration and utilization, followed by
2 human missions to Mars and other destinations;

Page 13, beginning on line 23, strike "(hereinafter referred to as 'JSC')".

Page 14, line 7, strike "JSC" and insert "Johnson Space Center".

Page 14, line 12, strike "JSC" and insert "Johnson Space Center".

Page 15, line 4, strike "JSC" and insert "Johnson Space Center".

Page 15, line 11, strike "JSC" and insert "Johnson Space Center".

Page 16, strike lines 8 through 22 and insert the following:

3 (c) GAO REPORT ON METRICS FOR LOGISTICAL AND
4 TRANSPORT REDUNDANCY.—
5 (1) IN GENERAL.—Not later than 180 days
6 after the date of enactment of this Act, the Comp-
7 troller General of the United States shall submit to
8 the Committee on Science, Space, and Technology of
9 the House of Representatives and the Committee on
10 Commerce, Science, and Transportation of the Sen-
11 ate a report that contains an evaluation of appro-

1 priate technical benchmarks and metrics on the suit-
2 ability and performance, including cost, reliability,
3 and availability of—
4 (A) all available crew and cargo vehicles
5 for destinations in low-Earth orbit, cis-lunar
6 space, and beyond; and
7 (B) all available launch vehicles that are
8 capable of deploying more than 20 tons to low-
9 Earth orbit and beyond, to support exploration
10 and scientific missions, particularly to outer
11 planets.
12 (2) INCLUSION IN NASA ANALYSIS.—The Ad-
13 ministrator shall consider the Comptroller General's
14 report findings on benchmarks and metrics as part
15 of NASA's analysis of logistical and transport re-
16 dundancy.

Page 18, after line 2, insert the following (and conform the table of contents accordingly):

17 **SEC. 206. MOBILE LAUNCH PLATFORM AND INTERIM CRYO-**
18 **GENIC PROPULSION STAGE.**
19 Consistent with NASA's appropriation for fiscal year
20 2018, the Administrator shall pursue the following:
21 (1) The expeditious development of a new-build,
22 second Mobile Launch Platform specifically designed

1 to support the launch of Space Launch System con-
2 figurations that use the Exploration Upper Stage.
3 (2) The procurement of a second Interim Cryo-
4 genic Propulsion Stage.

Page 20, line 18, strike "to the greatest extent practicable, foster" and insert "foster, to the greatest extent practicable".

Page 23, line 1, insert "of" before "GISS".

Page 30, line 5, strike "electric".

Page 34, line 5, strike "A fundamental objective" and insert "One of the fundamental objectives".

Page 35, line 2, strike "project" and insert "Project".

Page 35, line 9, strike "project" and insert "Project from the Aeronautics account".

Page 35, beginning on line 20, strike "or through a public private partnership with a United States commercial provider".

Page 36, line 10, strike "the".

Strike sections 502, 503, and 506 of the bill (and redesignate and update the table of contents accordingly).

Page 38, after line 3, insert the following:

1 **SEC. 502. SPACE SERVICES AND IN-SPACE INFRASTRUC-**
2 **TURE.**

3 (a) SENSE OF CONGRESS.—It is the sense of Con-
4 gress that there exist many commercial opportunities with
5 a wide array of providers and partners that will allow for
6 more effective use of taxpayer investments in the pursuit
7 of the long-term goals of NASA, as described in section
8 202(a) of the National Aeronautics and Space Administra-
9 tion Authorization Act of 2010 (42 U.S.C. 18312(a)), in-
10 cluding expanding permanent human presence beyond low-
11 Earth orbit.

12 (b) REPORT.—Not later than 120 days after the date
13 of enactment of this Act, the Administrator shall submit
14 to the Committee on Science, Space, and Technology of
15 the House of Representatives and the Committee on Com-
16 merce, Science, and Transportation of the Senate a report
17 describing the various commercial opportunities and op-
18 tions for the procurement of in-space services or use of
19 in-space infrastructure for exploration and other NASA
20 missions.

Page 43, line 11, insert ", States, and local governments" after "entities".

Page 43, line 14, insert ", States, and local governments" after "entities".

Page 43, line 24, insert "the" before "Administrator".

Page 44, line 5, strike "Technologies".

Page 47, beginning on line 14, strike "the Commerce, Science, and Transportation Committee of the Senate" and insert "the Committee on Commerce, Science, and Transportation of the Senate".

Page 51, line 20, strike "by President Trump" and insert "in 2017 by the President".

At the end of the bill, add the following (and update the table of contents accordingly):

1 **SEC. 607. NASA LAUNCH SUPPORT AND INFRASTRUCTURE**
2 **MODERNIZATION PROGRAM.**

3 (a) LAUNCH SUPPORT AND INFRASTRUCTURE MOD-
4 ERNIZATION.—The Administrator shall continue the pro-
5 gram established under section 305 of the National Aero-
6 nautics and Space Administration Authorization Act of
7 2010 (42 U.S.C. 18325) for launch support and infra-
8 structure modernization for launch sites and ranges at
9 NASA facilities that support the International Space Sta-
10 tion mission.

11 (b) LEVERAGE OF INFRASTRUCTURE INVEST-
12 MENTS.—Such program should, to the greatest extent
13 practicable, leverage current and planned State govern-

1 ment infrastructure investments at NASA facilities to sup-
2 port these and other missions and use funding available
3 under this program to collaborate on relevant infrastruc-
4 ture projects.

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AMENDMENT TO H.R. 5503

OFFERED BY MR. PERLMUTTER OF COLORADO

At the end of title II of the bill, add the following:

1 **SEC. _____. MARS 2033.**

2 (a) FINDING.—Congress finds that human explo-
3 ration of Mars is an important objective in NASA's human
4 exploration agenda.

5 (b) PRIORITIZATION.—The Administrator shall
6 prioritize timelines for fulfillment of the engineering,
7 science, and safety requirements to reduce mission risk
8 and ensure mission completion when evaluating human ex-
9 ploration of Mars by 2033, if not sooner.

AMENDMENT TO H.R. 5503

OFFERED BY MR. POSEY OF FLORIDA

At the appropriate place in the bill, insert the following:

1 **SEC. _____. SECURITY MANAGEMENT OF FOREIGN NA-**
2 **TIONAL ACCESS.**

3 The Administrator shall notify the Committee on
4 Science, Space, and Technology of the House of Rep-
5 resentatives and the Committee on Commerce, Science,
6 and Transportation of the Senate when the agency has
7 implemented the information technology security rec-
8 ommendations from the National Academy of Public Ad-
9 ministration on foreign national access management.

AMENDMENT TO H.R. 5503

OFFERED BY MR. DUNN OF FLORIDA

At the appropriate place in the bill, insert the following:

1 **SEC. _____. FEDERAL-STATE PARTNERSHIPS.**

2 (a) SENSE OF CONGRESS.—It is the sense of Con-
3 gress that, as State and local governments have invested
4 hundreds of millions of dollars in new infrastructure and
5 operations at Administration space facilities to meet the
6 needs of civil, national security, and commercial space ac-
7 tivities, the Administration should seek to leverage such
8 investments and the resources and capabilities of State
9 and local governments.

10 (b) REPORT.—Not later than 120 days after the date
11 of enactment of this Act, the Administrator shall submit
12 to Congress a report describing—

13 (1) existing partnerships with State and local
14 governments at Administration facilities;

15 (2) past and current investments and partner-
16 ships in facility infrastructure and operations with
17 State and local government that benefitted Federal,
18 State, and commercial users;

1 (3) the contracting mechanisms used and the
2 average response time from a facility infrastructure
3 partnership proposal to approval by the Administra-
4 tion;
5 (4) current or prospective opportunities for
6 Federal-State matching grant funding to support
7 shared infrastructure;
8 (5) the benefits and challenges associated with
9 Federal-State infrastructure partnerships; and
10 (6) how, it at all, the Administration should ex-
11 pand Federal-State partnerships to better meet the
12 needs of civil, national security, and commercial
13 space activities.

AMENDMENT TO H.R. 5503

OFFERED BY MR. ROHRABACHER OF CALIFORNIA

Page 4, after line 16, insert the following (and redesignate the remaining sections accordingly):

1 **SEC. 101. AUTHORIZATION OF APPROPRIATIONS CONTIN-**
2 **GENT ON NASA ADMINISTRATOR CONFIRMA-**
3 **TION.**

4 No appropriations shall be authorized to NASA until
5 a NASA Administrator nominee is confirmed by the
6 United States Senate. On the date of such confirmation,
7 sections 102 and 103 shall take effect.

AMENDMENT TO H.R. 5503

OFFERED BY MR. ROHRABACHER OF CALIFORNIA

At the end of the bill, add the following:

1 **SEC. 6___. REAFFIRMATIONS ON ORBITAL DEBRIS.**

2 (a) REAFFIRMATION OF FINDINGS.—Congress reaf-
3 firms the findings under section 839(a) of the National
4 Aeronautics and Space Administration Transition Author-
5 ization Act of 2017 (Public Law 115–10) that—

6 (1) orbital debris poses serious risks to the
7 operational space capabilities of the United States;

8 (2) an international commitment and integrated
9 strategic plan are needed to mitigate the growth of
10 orbital debris wherever possible; and

11 (3) the delay in the Office of Science and Tech-
12 nology Policy's submission of a report on the status
13 of international coordination and development of or-
14 bital debris mitigation strategies is inconsistent with
15 such risks.

16 (b) REAFFIRMATION OF SENSE OF CONGRESS.—Con-
17 gress reaffirms the sense of Congress under section 840(a)
18 of the National Aeronautics and Space Administration
19 Transition Authorization Act of 2017 (Public Law 115–
20 10) that—

(1) orbital debris in low-Earth orbit poses significant risks to spacecraft;

(2) such orbital debris may increase due to collisions between existing debris objects; and

(3) understanding options to address and remove orbital debris is important for ensuring safe and effective spacecraft operations in low-Earth orbit.

AMENDMENT TO H.R. 5503

OFFERED BY MR. ROHRABACHER OF CALIFORNIA

Page 37, after line 20, insert the following (and redesignate accordingly):

1 "(e) PUBLIC DISCLOSURES.—A determination made
2 by the Administrator or the Secretary regarding a space
3 product under subsection (d) shall be publicly disclosed 30
4 days prior to the acquisition of such space product.".

☒

AMENDMENT TO H.R. 5503

OFFERED BY MR. PERLMUTTER OF COLORADO

Page 6, line 6, strike "$20,736,140,000" and insert "$20,744,140,000".

Page 8, line 11, strike "$100,000,000" and insert "$108,000,000".

Page 8, line 15, strike "$40,000,000" and insert "$48,000,000".

AMENDMENT TO H.R. 5503

OFFERED BY MR. PERLMUTTER OF COLORADO

Page 6, line 6, strike "$20,736,140,000" and insert "$21,207,140,000".

Page 8, line 3, strike "$6,152,600,000" and insert "$6,623,600,000".

Page 8, line 4, strike "$1,450,000,000" and insert "$1,921,000,000".

AMENDMENT TO H.R. 5503

OFFERED BY MR. FOSTER OF ILLINOIS

Page 29, line 23, strike "and".

Page 30, line 3, strike the period at the end and insert "; and".

Page 30, after line 3, insert the following:

1 (H) a cost analysis, including long-term
2 and security costs, of the use of highly enriched
3 uranium versus low-enriched uranium in power
4 generation in space applications, including sur-
5 face power and in-space propulsion.

Amendment to H.R.5503 offered by Mr. Knight

The Administrator shall submit to the Committee a report on the development of the Low-Boom Flight Demonstration aircraft, including the following:

1) NASA's planned coordination with other executive agencies to ensure developmental and operational testing infrastructure availability during flight demonstration; and
2) NASA's acquisition strategy to ensure availability of chase aircraft for flight demonstration.

PROCEEDINGS OF THE FULL COMMITTEE MARKUPS: H.R. 5905, DEPARTMENT OF ENERGY SCIENCE AND INNOVATION ACT OF 2018; H.R. 5907, NATIONAL INNOVATION MODERNIZATION BY LABORATORY EMPOWERMENT ACT; AND H.R. 5906, ARPA-E ACT OF 2018

WEDNESDAY, MAY 23, 2018

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:36 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recess at any time.

Pursuant to Committee Rule II(e) and House Rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today we meet to consider H.R. 5905, the *Department of Energy Science and Innovation Act of 2018*; H.R. 5907, the *National Innovation Modernization by Laboratory Empowerment Act*; and H.R. 5906, the *ARPA-E Act of 2018*. I'll recognize myself for an opening statement.

Today we consider these three energy bills. Together, they prioritize basic science research, modernize and increase the productivity of the DOE national labs, and enable the development of new technologies for the next generation.

The first bill is H.R. 5905, the *Department of Energy Science and Innovation Act of 2018*, sponsored by Energy Subcommittee Chairman Randy Weber and Representative Zoe Lofgren. This legislation authorizes the basic research programs within the DOE Office of Science for fiscal years 2018 and 2019. It includes research in basic energy sciences, advanced scientific computing, high-energy physics, biological and environmental research, fusion energy science, and nuclear physics. These basic research programs are the core mission of the Department and will lead to scientific discoveries that will maintain U.S. leadership in technology. The bill authorizes basic research programs in solar fuels, electricity storage, bio-

energy research, exascale computing, and low-dose radiation. It also authorizes Office of Science funding for upgrades and construction of seven high-priority user facilities at DOE national labs. These infrastructure and program investments are crucial to ensuring America remains a leader in basic research and innovation.

This legislation is the product of over 4 years of bipartisan work by the Science Committee to advance basic research and set clear science priorities for the Department of Energy. It builds on the achievements of the House-passed H.R. 589, the *Department of Energy Research and Innovation Act*, and incorporates four bipartisan Science Committee infrastructure bills that passed the House in February.

One example of the central missions authorized in the *DOE Science and Innovation Act* is the Exascale Computing program. Developing an exascale system is critical to enabling scientific discovery, strengthening national security, and promoting U.S. industrial competitiveness. Exascale computing will have real-world benefits for American industry and entice the best researchers in the world to conduct groundbreaking science at the DOE labs.

In order to strengthen U.S. energy independence, this legislation also provides support for fusion energy sciences. When commercial fusion becomes available, it will revolutionize the energy market and could significantly reduce global carbon emissions.

This bill authorizes funds for U.S. contributions to the International Thermonuclear Experimental Reactor, or ITER, project, a critical step to achieving commercial fusion energy.

I again thank Representative Weber as well as Representative Lofgren for their longstanding support of basic research and investments in our world class science facilities at the DOE national labs.

The next energy bill is H.R. 5907, the *National Innovation Modernization by Laboratory Empowerment Act*. This legislation directs the Secretary to provide signature authority to the directors of the national laboratories, allowing lab directors to make decisions on cooperative agreements with industry where the total cost is less than $1 million. This provides the labs with more flexibility and removes red tape that makes it difficult for businesses to partner with the labs. DOE national labs can provide the private sector with access to research infrastructure as they develop new technologies but a lengthy approval process can smother industry's interest. This bill gives the labs freedom to pursue agreements that will increase U.S. competitiveness and maintain our technology leadership.

I want to thank this bill's sponsors, Representative Randy Hultgren and Representative Ed Perlmutter, for their efforts on this initiative.

H.R. 5906, the *ARPA-E Act of 2018*, is our third and last energy bill today. H.R. 5906, sponsored by Science Committee Vice Chairman Frank Lucas and Ranking Member Eddie Bernice Johnson, establishes DOE policy for the Advanced Research Projects Agency-Energy program. This legislation expands the mission of ARPA-E, and allows the program to develop transformative science and technology solutions to address energy, environmental, economic, and national security challenges. Notably, this includes allowing ARPA-

E to develop technologies to address the management, clean-up, and disposal of nuclear waste.

This bill also maximizes the Department's resources. It requires ARPA-E to coordinate with other DOE programs and avoid duplication and ensures that ARPA-E grants go to innovative technologies that would not otherwise be funded by the private sector.

Together, these three bills prioritize critical research and outline important reforms to DOE programs within Science Committee jurisdiction.

PREPARED STATEMENT OF CHAIRMAN SMITH

Today we will consider three energy bills. Together, they prioritize basic science research, modernize and increase the productivity of the Department of Energy (DOE) national labs and enable the development of new technologies for the next generation.

The first bill is H.R. 5905, the *Department of Energy Science and Innovation Act of 2018*, sponsored by Energy Subcommittee Chairman Randy Weber and Rep. Zoe Lofgren. This legislation authorizes the basic research programs within the DOE Office of Science for fiscal years 2018 and 2019. It includes research in basic energy sciences, advanced scientific computing, high energy physics, biological and environmental research, fusion energy science and nuclear physics.

These basic research programs are the core mission of the department and will lead to scientific discoveries that will maintain U.S. leadership in technology.

This bill authorizes basic research programs in solar fuels, electricity storage, bioenergy research, exascale computing and low dose radiation. It also authorizes Office of Science funding for upgrades and construction of seven high-priority user facilities at DOE national labs. These infrastructure and program investments are crucial to ensuring America remains a leader in basic research and innovation.

This legislation is the product of over four years of bipartisan work by the Science Committee to advance basic research and set clear science priorities for the Department of Energy.

It builds on the achievements of the House passed H.R. 589, the *Department of Energy Research and Innovation Act*, and incorporates four bipartisan Science Committee infrastructure bills that passed the House in February.

One example of the central missions authorized in the *DOE Science and Innovation Act* is the Exascale Computing Program. Developing an exascale system is critical to enabling scientific discovery, strengthening national security and promoting U.S. industrial competitiveness. Exascale computing will have real world benefits for American industry and entice the best researchers in the world to conduct groundbreaking science at the DOE labs.

In order to strengthen U.S. energy independence, this legislation also provides support for fusion energy sciences. When commercial fusion becomes available, it will revolutionize the energy market and could significantly reduce global carbon emissions.

This bill authorizes funds for U.S. contributions to the International Thermonuclear Experimental Reactor (ITER) project, a critical step to achieving commercial fusion energy.

I again thank Rep. Weber as well as Rep. Lofgren for their long-standing support of basic research and investments in our world class science facilities at the DOE national labs.

The next energy bill is H.R. 5907, the *National Innovation Modernization by Laboratory Empowerment (NIMBLE) Act*.

This legislation directs the secretary to provide signature authority to the directors of the national laboratories, allowing lab directors to make decisions on cooperative agreements with industry where the total cost is less than $1 million.

This provides the labs with more flexibility and removes red tape that makes it difficult for businesses to partner with the labs. DOE national labs can provide the private sector with access to research infrastructure as they develop new technologies. But a lengthy approval process can smother industry's interest. This bill gives the labs freedom to pursue agreements that will increase U.S. competitiveness and maintain our technology leadership.

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This legislation expands the mission of ARPA-E, and allows the program to develop transformative science and technology solutions to address energy, environmental, economic and national security challenges. Notably, this includes allowing ARPA-E to develop technologies to address the management, clean-up, and disposal of nuclear waste.

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Together, these three bills prioritize critical research and outline important reforms to DOE programs within Science Committee jurisdiction.

Chairman SMITH. That concludes my opening statement, and the Ranking Member, the gentlewoman from Texas, Ms. Johnson, is recognized for hers.

Ms. JOHNSON. Thank you very much, Mr. Chairman, for holding today's markup of three important bills that support science and innovation at Department of Energy. The bills that we are considering today reflect many bipartisan priorities, and I hope each of them will receive strong support from Committee Members on both sides of the aisle today.

The first bill we are considering, the *Department of Energy Science and Innovation Act of 2018*, provides important statutory direction to one of the most critical agencies that this Committee oversees. The Department of Energy's Office of Science funds a wide range of research and development that has far-reaching impacts across DOE, the Federal Government, academia, and industry. Much of this language is derived from previous bipartisan, bicameral agreements that were included in H.R. 589, the House-passed *Department of Energy Research and Innovation Act of 2017*. As we await Senate action on that legislation, I support moving forward with additional language included in today's bill that would authorize upgrades to important Office of Science user facilities, direct DOE to provide sufficient support to maintain our commitments to the ITER international fusion project, and provide statutory authority to fund low-dose radiation research as well as a promising computational materials initiative at our national labs. I am also happy to see robust funding levels included in this bipartisan bill, particularly for the Biological and Environmental Research program, which supports critical research to reduce uncertainties and better understand the impacts of climate change.

If signed into law, I want to make it clear that I expect the Department of Energy to appropriately fund and steward all of these activities, including important work in environmental systems modeling. However, amidst all of the positive aspects of this bill, I must say that I am a little disappointed in the process that we used to get to this markup. With a more deliberative and collaborative process, we certainly could have produced more comprehensive, well-vetted language that better reflects input from national laboratories, academic institutions, and industry on important projects and programs funded by the Office of Science. Such a process would have made a good bill better.

The next bill we are considering is the *National Innovation Modernization by Laboratory Empowerment Act*. This bill would provide

our national laboratories with the authority to directly enter into certain research agreements with the private sector as long as those activities align with the laboratories' strategic plans approved by the Department of Energy. This bill also includes appropriate safeguards to prevent waste, fraud, or abuse. I am happy to see us moving forward once again with this important policy change.

The *ARPA-E Act of 2018* is a welcome development from my perspective. I understand some of my Majority colleagues have not always been the biggest supporters of ARPA-E, but after years of successes and several independent assessments praising the agency's work, we are finally passing a bill out of this Committee reauthorizing this now-vital component of our energy innovation pipeline. This bill preserves the mission and form of ARPA-E, while enabling it to also consider funding projects or technologies that can address DOE" monumental and longstanding challenge of environmental cleanup at the legacy sites of the Manhattan Project.

It also includes language from a bipartisan *ARPA-E Reauthorization Act* that I introduced last year, which would ensure that sensitive business information collected by the agency remains protected. This will enable even greater private sector engagement in its programs.

ARPA-E projects have attracted more than $2.6 billion in private-sector follow-on funding. Seventy-one projects have formed new companies, and 109 have gone on to partner with other government agencies to further their research.

I want to thank you, Mr. Chairman and Congressman Lucas, for embracing ARPA-E's innovative model and joining me in supporting its reauthorization.

I thank you, and I yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith, for holding today's markup of three important bills that support science and innovation at DOE. The bills that we are considering today reflect many bipartisan priorities and I hope each of them will receive strong support from Committee Members on both sides of the aisle today. The first bill we are considering, the *Department of Energy Science and Innovation Act of 2018* provides important statutory direction to one of the most critical agencies that this Committee oversees. The Department of Energy's Office of Science funds a wide-range of research and development that has far-reaching impacts across DOE, the federal government, academia, and industry. Much of this language is derived from previous bipartisan, bicameral agreements that were included in H.R. 589, the House-passed *Department of Energy Research and Innovation Act of 2017*.

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Thank you Mr. Chairman, I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

H.R. 5905

Chairman SMITH. Pursuant to notice, I now call up H.R. 5905, the *Department of Energy Science and Innovation Act of 2018*, and the clerk will report the bill.

The CLERK. H.R. 5905, a bill to authorize basic research programs in the Department of Energy Office of Science for fiscal years 2018 and 2019.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

I'll recognize the bill's sponsor, the gentleman from Texas, the Chairman of the Energy Committee, Mr. Weber.

Mr. WEBER. Thank you, Mr. Chairman, for the opportunity to speak on behalf of my bill, H.R. 5905, the *Department of Energy Science and Innovation Act of 2018*.

This legislation authorizes the Department of Energy's Office of Science programs for fiscal years 2018 and 2019. It also authorizes upgrades and new construction of major user facilities at Department of Energy national labs and universities.

Over the past 4 years, the Energy Subcommittee has held hearings, met with stakeholders, and worked extensively with our colleagues to draft the language included in today's legislation. We spoke with lab directors, DOE officials, academia, and industry about the right priorities for the Office of Science. The result was a series of bills that the Science Committee has advanced this Congress, including H.R. 589, H.R. 4376, H.R. 4377, and H.R. 4675.

The legislation we will consider today combines these bills to form a comprehensive, bipartisan authorization of the Department's basic science research. This includes over $6 billion in fundamental research and discovery science, largely performed at DOE national laboratories and user facilities around the country.

Two weeks ago, I, along with several of my Science Committee colleagues, had the opportunity to visit a number of these facilities at Argonne National Laboratory and Fermi National Accelerator Laboratory. We got to see firsthand the incredible work that these men and women do not only for our country but for the world. And I have to agree with Secretary Perry when he testified before this Committee earlier this month that these labs are, and I quote, "incubators of innovation, and they are among America's greatest treasures." High-energy physics, advanced scientific computing, focusing on basic and fundamental research at our national labs, these all provide the best opportunity for innovation and economic growth. The *DOE Science and Innovation Act* authorizes funding for critical infrastructure projects at these national labs.

In the Basic Energy Sciences program, it authorizes upgrades to world-leading x-ray light source facilities around the country, like the Advanced Photon Source at Argonne National Laboratory, and the LINAC Coherent Light Source at SLAC National Accelerator Laboratory. These facilities give American scientists the tools they need to study the structure and behavior of physical and biological materials, enabling innovation in many fields, including creating new materials for industry and developing new pharmaceuticals.

This legislation also authorizes the construction of new DOE research facilities in nuclear physics and high-energy physics. This includes construction of the Facility for Rare Isotope Beams, or FRIB, at Michigan State University, which will enable critical nuclear physics research across a wide breadth of fields, ranging from astrophysics to medicine. It'll also the construction of the Long-Baseline Neutrino Facility at Fermilab, which is an internationally coordinated project designed to build the world's highest intensity neutrino beam. The research at this facility will help shed light on the universe and its origins.

This bill also specifically authorizes basic research in fields that are critical to U.S. dominance in science and technology. It authorizes research in exascale computing, in electricity storage, and fusion energy sciences. It establishes a DOE Exascale Computing program, a low-dose radiation research program, and programs for managing our Energy Frontier Research Centers and Bioenergy Research Centers and ensures that we fulfill our commitments to the ITER project for fiscal years 2018 as well as 2019.

Significant investments in basic science research by foreign countries like China threaten America's global standing as the leader in scientific knowledge. To maintain our competitive advantage as the world leader in science, we must continue to support this research and the research infrastructure that will lead to next-generation energy technologies.

H.R. 5905 is a commonsense bill that will maintain American leadership in science.

I want to thank Chairman Smith, Representative Lofgren, Vice Chairman Lucas, and many of my Science Committee colleagues for cosponsoring this important legislation. I'm grateful for the opportunity to work with the Members of this Committee to guide research that will help America compete around the world.

I encourage my colleagues to support this bill, and I yield back the balance of my time.

PREPARED STATEMENT OF MR. WEBER

Thank you Mr. Chairman for the opportunity to speak on behalf of my bill, H.R. 5905, the *Department of Energy Science and Innovation Act of 2018*.

This legislation authorizes the Department of Energy's Office of Science programs for fiscal years 2018 and 2019. It also authorizes upgrades and new construction of major user facilities at Department of Energy (DOE) national labs and universities.

Over the past four years, the Energy Subcommittee has held hearings, met with stakeholders, and worked extensively with our colleagues to draft the language included in today's legislation. We spoke with lab directors, DOE officials, academia and industry about the right priorities for the Office of Science.

The result was a series of bills that the Science Committee has advanced this Congress, including H.R. 589, H.R. 4376, H.R. 4377 and H.R. 4675.

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Two weeks ago, I, along with several of my Science Committee colleagues, had the opportunity to visit a number of these facilities at Argonne National Laboratory and Fermi National Accelerator Laboratory. We got to see first-hand the incredible work that these men and women do for our country and for the world. I have to agree with Secretary Perry when he testified before this committee earlier this month that these labs are "incubators of innovation, and they are among America's greatest treasures."

From high energy physics to advanced scientific computing, focusing on basic and fundamental research at our national labs provides the best opportunity for innovation and economic growth.

The *DOE Science and Innovation Act* authorizes funding for critical infrastructure projects at these national labs. In the Basic Energy Sciences program, it authorizes upgrades to world-leading x-ray light source facilities around the country, like the Advanced Photon Source at Argonne National Laboratory, and the LINAC Coherent Light Source at SLAC National Accelerator Laboratory.

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Significant investments in basic science research by foreign countries, like China, threaten America's global standing as the leader in scientific knowledge. To maintain our competitive advantage as a world leader in science, we must continue to support the research, and the research infrastructure, that will lead to next generation energy technologies.

H.R. 5905 is a common sense bill that will maintain American leadership in science. I want to thank Chairman Smith, Rep. Lofgren, Vice Chairman Lucas and many of my Science Committee colleagues for cosponsoring this important legislation. I'm grateful for the opportunity to work with the members of this committee to guide research that will help America compete around the world.

I encourage my colleagues to support this bill and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Weber, and I'm going to go first to the gentleman from Illinois, Mr. Foster, and then to the gentleman from New York, Mr. Tonko.

Mr. FOSTER. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentleman's recognized for 5 minutes.

Mr. FOSTER. Thank you again, Chairman Smith and Ranking Member Johnson, for holding this markup and for allowing me to say a few words.

I'm pleased to see that this comprehensive bill authorizing funding for the Department of Energy Office of Science includes two important projects: Argonne's Advanced Photon Source and Fermilab's Long-Baseline Neutrino Facility. I especially want to thank my colleague, Mr. Weber, for sponsoring this important legislation, and also for leading a delegation of Science Committee Members to visit Fermilab and Argonne a few weeks ago, and several of my colleagues on this Committee saw firsthand on that congressional delegation trip the cutting-edge science conducted at Argonne and at the user facilities they support are critical to U.S. industry and academic science.

Argonne's Advanced Photon Source, or APS, supports discovery science and market-driven research on materials, chemistry, physics, and biology. The APS is a user facility for thousands of academic national lab and industry scientists across the country. The APS has allowed scientists to visualize everything from nanoscale materials to high-speed liquid jets. The APS also facilitates development of products from solar shingles to drugs to treat HIV. The upgrade authorized in this bill will leverage existing infrastructure to create a world-leading facility at substantially less cost than a new facility. This upgrade will enable the APS to become the ultimate 3D microscope, opening up scientific frontiers at the nanoscale that are completely inaccessible today. Without it, the United States will lose its global leadership in x-ray science.

The second critical project that this bill authorizes is the LBNF DUNE project, which is critical to maintaining U.S. leadership in high-energy physics and fundamental science. The Long-Baseline Neutrino Facility at Fermilab in Batavia, Illinois, will power the Deep Underground Neutrino Experiment at the Sanford Underground Research Facility in Lead, South Dakota. LBNF DUNE will bring us great understanding of neutrinos, the most abundant and mysterious matter particles in the universe. LBNF DUNE will also be the first major international mega science project to be hosted by the Department of Energy in the United States. The LBNF DUNE international collaboration involves 1,000 scientists and engineers from 30 countries around the world.

On the congressional delegation tour of Fermilab earlier this month, several of my colleagues on the Science Committee were able to personally see some of the high-tech leading-edge work being done in high-energy physics and to meet many of my old friends from Argonne and Fermilab, where I worked for over 20 years. The work at these national labs is critical to maintaining our U.S. scientific leadership, and in fact, earlier this year I was proud to personally escort Secretary Perry on his visits to both Argonne and Fermilab and was thrilled to see his genuine enthusiasm for the science that is done there. This bill takes the important step of authorizing the funding for these projects in addition to pro-

viding comprehensive authorization language for the DOE Office of Science.

Science requires long-term and sustained funding in order to plan ahead and ensure opportunities are not missed, especially for large-scale, long-term projects such as these. This bill is an——

[Audio malfunction in hearing room]

Ms. LOFGREN [continuing]. Like Lawrence Berkeley and SLAC near my district but also excellent facilities across the United States. They are Centers of Innovation in many subjects, and especially for energy, used by scientists, researchers, students, even the private sector. There's a broad spectrum of topics where we see advances.

Now, it's no secret to Members of this Committee that I've been a longtime supporter and advocate for fusion energy research. A fusion has such a potential to provide abundant, reliable, emission-free, and practically limitless energy that would satisfy our electricity needs for the foreseeable future. It's a huge challenge. We have achieved fusion but not ignition so this is basically a research project at this point, but the potential benefits are so enormous for our world that it's important that the research be continued, and that's an additional reason why I am so pleased to be the Democratic cosponsor of this bill. In particular, I'm happy to see that it would establish an inertial fusion energy program that's consistent with the 2013 National Academies report and include inertial and other innovative fusion concepts in the development of a comprehensive strategic plan for fusion, also has been mentioned, sufficient support for both the U.S. commitments to ITER's international fusion project as well as the non-ITER portions of the fusion budget.

I want to thank Mr. Weber for introducing this bill and just say I'm proud to be the lead Democratic sponsor of this bill, and I thank both Mr. Weber and the Chairman for recognizing me.

I yield back.

Chairman SMITH. Thank you, Ms. Lofgren.

And the gentleman from New York, Mr. Tonko, is recognized.

Mr. TONKO. Thank you, Mr. Chair. I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. TONKO. Thank you, and thank you, Mr. Chair and Ranking Member Johnson, for this bill package that speaks significantly to our future, I believe.

Before I offer my comments, I would that I could recognize Cheyenne, who is our rep from the foster family program that's shadowing many of us today, and I thank Cheyenne for being here.

The only way America will meet our greatest energy challenges is with smart, visionary investments in research and development. Our Federal Government has an exemplary record of partnering with universities and private-sector leaders to drive innovation including critical smartphone technologies and the framework for the internet.

Groundbreaking advances by America's private sector and university communities are propelled and even made possible by a public R&D portfolio that covers the spectrum from basic science to technology development, testing and deployment. Ongoing sup-

port of these smart investments is essential to driving down costs and improving performance of advanced and everyday energy technologies.

I am relieved to be working on a bipartisan basis to move this legislation forward to support American science and energy innovation. The Office of Science at DOE supports critical work that is producing major breakthroughs in science, in energy innovation, and, indeed, in national security.

ARPA-E continues to play a critical role in expanding our portfolio of innovation programs and lowering risk on projects that advance the horizon of our discovery, a vial pathfinding tool for our future economy and national security that simply would not be supported by the private sector. Failing to adequately support and fund these critical initiatives will undermine development of our next generation of scientists and engineers and the transformative achievements they will be responsible for, and our Nation will future lose its standing as a world leader in energy innovation. We must press forward and innovate.

Supporting such innovation must also mean support for adequate funding. I hope that this Committee continues to invest in America's future and redouble our bipartisan commitment to this critical innovation.

And with that, Mr. Chair, I yield back.

Chairman SMITH. Thank you, Mr. Tonko.

The only amendment to H.R. 5905 on the roster that I'm aware of is a Manager's Amendment offered by the gentleman from Texas, Mr. Weber, and he's recognized for that purpose.

Mr. WEBER. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to *Department of Energy and Science Innovation Act of 2018* offered by Mr. Weber of Texas, amendment #019.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. WEBER. Thank you, Chairman.

This amendment provides for technical changes to the legislation. I do appreciate the opportunity to work with the Minority and to identify these changes prior to today's markup and for their support of this important legislation authorizing the Department of Energy Office of Science. I encourage my colleagues to support the amendment, and with that, Mr. Chairman, I yield back.

Chairman SMITH. Thank you, Mr. Weber, and the Ranking Member is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman. I'd like to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. Thank you very much. I support this Manager's Amendment, which makes some positive changes to the bill.

I'd also like to take a moment to thank both Chairman Smith and Subcommittee Chairman Weber and their staffs for working with us on this amendment. It's a good amendment to a good bill, and I urge my colleagues to support it.

I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

If there's no further discussion on the amendment, the question is on agreeing to the amendment offered by Mr. Weber.

All in favor, say aye.

Those opposed, say no.

The ayes have it, and the amendment is agreed to.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5905 to the House as amended with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 5905 to the House as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the Motion to Reconsider is laid upon the table. H.R. 5905 is ordered reported to the House, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

H.R. 5907

Chairman SMITH. Pursuant to notice, I now call up H.R. 5907, the *National Innovation Modernization by Laboratory Empowerment Act*, and the clerk will report the bill.

The CLERK. H.R. 5907, a bill to provide Directors of the National Laboratories signature authority for certain agreements, and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

Chairman SMITH. I'll recognize the bill's sponsor, Mr. Hultgren, for his opening statement.

Mr. HULTGREN. Thank you, Chairman, for this markup today and for all your help on this. I'd also like to thank the distinguished Chairman of the Energy Subcommittee for his help on the underlying bill. I'd also like to thank my colleague from Colorado, Mr. Perlmutter, for his help on this bipartisan legislation that would help our national labs better work with all businesses, but especially small businesses, by being more nimble and being able to quickly react to the needs of the private sector working with the labs.

In the previous Congress, this House passed legislation I introduced with the gentleman from Colorado, which would do a number of things to modernize the national laboratories, including the provision we have introduced as a standalone today. In the 113th Congress, this House passed similar legislation without opposition.

I've had the opportunity to visit a number of our national laboratories, and the thing they all have in common is the unique expertise they house and the world-leading instruments they maintain. They truly are the crown jewel in our research ecosystem, and this legislation would make it easier to access the labs for the general public.

One of the primary issues I have heard about, with the public trying to work with our laboratories, is the time it takes for many

agreements to be worked out, often taking months after laboratory approval before final sign-off from the Department. Make no mistake: I believe oversight of our national labs by the Department is vital, and the labs must be aligned under the mission of the Department, but I do believe there should be some level of trust given to the labs to enter into smaller agreements. With this legislation, signature authority for cooperative research and development agreements, work-for-other agreements, and other agreements determined appropriate by DOE would be given to the labs so long as they totaled less than $1 million. With the increased reporting requirements for these agreements, I believe this strikes the proper balance for oversight with the Department and the intentions of Congress in creating the government-owned, contractor-operated model of the national labs.

I'm grateful for the Secretary at our recent hearing signaling his willingness to work with this idea, and I believe it fits with the Administration's priorities in removing red tape where it's not needed and freeing the private sector up to innovate and bring new ideas to market.

So again, thank you, Chairman. I want to thank also the gentleman from Colorado and all of my colleagues on the Committee for their support, and I urge passage of this important legislation.

With that, I yield back.

PREPARED STATEMENT OF MR. HULTGREN

Thank you Chairman Smith for this markup today. And I would like to thank the distinguished chairman of the Energy Subcommittee for his help on the underlying bill.

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One of the primary issues I have heard about, with the public trying to work with our laboratories, is the time it takes for many agreements to be worked out, often taking months after laboratory approval before final sign-off from the department.

Make no mistake, I believe oversight of our national labs by the department is vital, and the labs must be aligned under the mission of the department, but I do believe there should be some level of trust given to the labs to enter into smaller agreements.

With this legislation, signature authority for cooperative research and development agreements, work-for-other agreements and other agreements determined appropriate by DOE, would be given to the labs so long as they totaled less than $1 million.

With the increased reporting requirements for these agreements, I believe this strikes the proper balance for oversight with the department and the intentions of Congress in creating the government-owned, contractor-operated model of the national labs.

I am grateful for the secretary at our recent hearing signaling his willingness to work with this idea, and I believe it fits with the administration's priorities in removing red-tape where it is not needed and freeing the private sector up to innovate and bring new ideas to market.

So again, I thank the chairman, the gentleman from Colorado and all of my colleagues on the committee for their support, and I urge passage of this important legislation.

Chairman SMITH. Thank you, Mr. Hultgren. I appreciate that.

And the gentleman from Colorado, Mr. Perlmutter, is recognized.

Mr. PERLMUTTER. Thank you, Mr. Chairman, and thank you, Mr. Hultgren. I was surprised at the gentleman from Illinois that you didn't talk about any of your labs or the universities of Illinois, but Dr. Foster took care of that, so I think you're good.

But I appreciate the gentleman for bringing this bill. It does give the opportunity to the directors of the labs to have authority and some discretion in dealing with contracts and agreements that are a million dollars or less. That will allow the labs to enter into these agreements in a much quicker basis but it doesn't relieve us of oversight, doesn't relieve the labs of auditing trails and appropriate accounting for these kinds of things but it does allow them to enter into contracts on a much quicker basis.

So I think this is a good bill. It was part of the overall *Modernization of our Laboratories Act* that Mr. Hultgren and I sponsored earlier. This piece, I think, should move very quickly through the process, and as this Committee knows, I represent Golden, Colorado, and the National Renewable Energy Lab. NREL is the premiere, energy efficiency and renewable energy lab in the world, and for more than 40 years, NREL has led the charge in research and design of renewable-energy products directly affecting the way we utilize and secure American energy.

This bill would allow that director of that laboratory to enter into contracts of a million dollars or less without going through a whole bunch of levels of approval. Obviously over that, then the approval process kicks in but the auditing process to make sure that there isn't any funny business will always be there. So this gives us an opportunity to be nimble, as the title to the bill would suggest. It gives the opportunity to have discretion within our directors, who are all very accomplished individuals and will allow us to move quickly in a very fast field that is competitive all around the world.

So I thank the gentleman from Illinois for bringing this bill and allowing me to cosponsor with him.

I yield back.

Chairman SMITH. Thank you, Mr. Perlmutter.

If there are no amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5907 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 5907 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the Motion to Reconsider is laid upon the table, and H.R. 5907 is ordered reported to the House.

H.R. 5906

Chairman SMITH. Now, pursuant to notice, I now call up H.R. 5906, the *ARPA-Act of 2018*, and the clerk will report the bill.

The CLERK. H.R. 5906, a bill to amend the *America COMPETES Act* to establish Department of Energy policy for Advanced Research Projects Agency-Energy, and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

Chairman SMITH. And the bill's sponsor, the gentleman from Oklahoma, Mr. Lucas, is recognized for his opening statement.

Mr. LUCAS. Thank you, Mr. Chairman, for the opportunity to speak on behalf of this important legislation.

The *ARPA-E Act of 2018* requires the Department of Energy to refocus ARPA-E toward developing transformative science and technology solutions to address energy, environment, economic, and national security challenges.

ARPA-E was created to ensure that the U.S. energy sector maintained a competitive edge in developing energy technologies. The program was established to help develop high-potential, high-impact energy technologies that were too early stage to attract private-sector investment. ARPA-E was designed to provide finite research and development funding for a limited time, with the intention to have quick, notable impact on the development of new energy technologies. In order to accomplish this, ARPA-E was given a unique management structure, with flexibility start and stop research projects that are no longer achieving individual goals, expedited hiring and firing authority to make sure ARPA-E staff could adequately select and support projects, and the tools to identify market challenges that could affect the advancement in project technologies.

However, there are a number of issues that have made ARPA-E controversial over the years. The first is the worry this is just more of the same from the Department of Energy. After all, with the Energy Efficiency and Renewable Energy program funded at over $2.3 billion, why did we need another clean energy program? Second, we've heard concerns over the years that ARPA-E wasn't meeting its intended goal—to fund the kind of technologies that are so innovative they would never attract private-sector investment—but was instead providing funding to big companies with access to market capital, or funding research that was already underway in other Federal agencies, or in the private sector. I believe that while these are valid concerns, ARPA-E is a program that can and has had tremendous impact on the development of new energy technologies.

Over the 10-years after its establishment, the bill we will consider today will both address these concerns, and enable ARPA-E to apply its innovative approach to a broader set of technology challenges.

The reforms in this legislation will expand the mission of ARPA-E to include the full DOE mission, and empower the agency to promote science and technology-driven solutions to DOE's broad mission goals. Following the mission of the Department, the *ARPA-E Act of 2018* will allow the agency to solve big challenges, like nuclear waste management and cleanup, reducing the environmental impact of energy production, and improving the reliability, resiliency, and security of the electric grid.

The bill also provides the Secretary with flexibility to identify additional challenges for ARPA-E to address within the core mission of the Department. The *ARPA-E Act* also takes important steps to prevent the duplication of research across DOE and to require applicants to indicate that they have attempted to find private-sector financing for a particular technology. This good-governance provision ensures limited taxpayer dollars are spent on the most innovative and transformative technologies, not in competition with the private sector.

With the right mission goals and management, I believe ARPA-E's innovative approach can build on the basic science and early stage research at the Department, and help fast-track new technologies that will grow our economy.

Once again, I'd like to thank Chairman Smith for supporting this legislation. I'd also to thank Ranking Member Johnson for cosponsoring this bipartisan bill. I encourage my colleagues to support the bill, and I yield back the balance of my time, Mr. Chairman.

PREPARED STATEMENT OF MR. LUCAS

Thank you, Chairman Smith, for the opportunity to speak on behalf of this important legislation.

The *ARPA-E Act of 2018* requires the Department of Energy (DOE) to refocus ARPA-E towards developing transformative science and technology solutions to address energy, environment, economic and national security challenges.

ARPA-E was created to ensure the U.S. energy sector maintained a competitive in developing emerging energy technologies. The program was established to help develop "high-potential, high-impact energy technologies" that were too early stage to attract private sector investment.

ARPA-E was designed to provide finite research and development funding for a limited time, with the intention to have quick, notable impact on the development of new energy technologies. In order to accomplish this goal, ARPA-E was given a unique management structure, with flexibility start and stop research projects that are no longer achieving individual goals, expedited hiring and firing authority to make sure ARPA-E staff could adequately select and support projects, and the tools to identify market challenges that could affect the advancement in project technologies.

However, there are a number of issues that have made ARPA-E controversial over the years. The first is the worry this is just more of the same from the Department of Energy. After all, with the Energy Efficiency and Renewable Energy program funded at over $2.3 billion, why did we need another clean energy program?

Second, we've heard concerns over the years that ARPA-E wasn't meeting its intended goal-to fund the kind of technologies that are so innovative they would never attract private sector investment-but was instead providing funding to big companies with access to market capital, or funding research that was already underway in other federal agencies, or in the private sector.

I believe that while these are valid concerns, ARPA-E is a program that can and has had tremendous impact on the development of new energy technologies. Over ten years after its establishment, the bill we will consider today will both address these concerns, and enable ARPA-E to apply its innovative approach to a broader set of technology challenges.

This legislation will expand the mission of ARPA-E to include the full DOE mission, and empower the agency to promote science and technology driven solutions to DOE's broad mission goals.

Following the mission of the department, the *ARPA-E Act of 2018* will allow the agency to solve big challenges, like nuclear waste management and clean-up, reducing the environmental impact of energy production, and improving the reliability, resiliency and security of the electric grid.

The bill also provides the secretary with the flexibility to identify additional challenges for ARPA-E to address within the core mission of the department.

The *ARPA-E Act* also takes important steps to prevent the duplication of research across DOE and to require applicants to indicate that they have attempted to find private sector financing for a particular technology.

This good governance provision ensures limited taxpayer dollars are spent on the most innovative and transformative technologies, not in competition with the private sector.

With the right mission goals and management, I believe ARPA-E's innovative approach can build on the basic science and early-stage research at the department, and help fast track new technologies that will grow our economy.

Once again, I would like to thank Chairman Smith for supporting this important legislation. I also want to thank Ranking Member Johnson for cosponsoring this bipartisan legislation. I encourage my colleagues to support this bill, and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Lucas.

And the gentlewoman from Texas, the Ranking Member, is recognized for her comments.

Ms. JOHNSON. Thank you, Mr. Chairman.

I have spoken on this bill in the opening statement so I'll be brief. I just want to thank Mr. Lucas for sponsoring this bill, which I am cosponsoring.

ARPA-E is widely considered one of the most successful and cost-effective programs at the Department of Energy. I am a big supporter of their work, and as the appropriators' process moves forward, I hope that we can work together to ensure that this program is fully funded.

I want to again thank Mr. Lucas and Chairman Smith for working with us. I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

The only amendment on the roster is a Manager's Amendment offered by the gentleman from Oklahoma—oh, I am sorry. The gentleman from California, Mr. McNerney, is recognized.

Mr. MCNERNEY. I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. MCNERNEY. I thank the Chairman for bringing these bills today.

I want to second the comments of my colleague from California, Ms. Lofgren. The national labs are a tremendous asset for our Nation. I worked at the Sandia National Lab in Albuquerque for a number of years, and I saw the tremendous resource of innovative talent and innovative drive that my colleagues had at the labs. Livermore National Lab is right outside of my district, and I see the passion of people that work there so I appreciate their work, and this Committee should continue to support the work that's conducted by our national laboratories. In particular, I support the nuclear fusion programs. Again, like Ms. Lofgren, I see tremendous potential for that technology as it matures.

And I also want to say that ARPA-E, the bill under discussion now, has been a real opportunity for energy innovation, which is badly needed. We do have energy challenges in this country. We need to address climate change, and ARPA-E is a tremendous tool for doing that.

So I support the bill and I support the Chairman and the Ranking Member, and my friend from Oklahoma, Mr. Lucas, for bringing this forward. I yield back.

Chairman SMITH. Thank you, Mr. McNerney.

And the gentlewoman from Oregon, Ms. Bonamici, is recognized.

Ms. BONAMICI. Thank you very much, Mr. Chairman, and I want to join my colleagues in offering support for this important bill, and thank Mr. Lucas and Ranking Member Johnson for bringing it for-

ward, and also say that I'm pleased that we're doing this bipartisan package of bills today.

I also want to ask the Science Committee to welcome my foster intern for the day, Isaiah Paloma. Isaiah spent time—although he lives in Oregon now, he spent time in the Idaho foster youth system, serving on the Idaho Foster Youth Advisory Board. He now lives in Seaside, Oregon, in the district I'm honored to represent, and is part of the congressional Foster Youth Shadow program, and I want to say, Mr. Chairman and Committee Members, I think it's really important that we're doing this package of bipartisan bills today when we have foster youth here from around the country to show them that we are able to work together and willing to invest in something as important as research and innovation into our energy future.

So thank you, Mr. Chairman, and thank you, colleagues. Yes, Isaiah is here today sitting behind me today. Thank you so much for bringing this package of bills forward. I look forward to supporting them here in the Committee and on the floor, and I yield back. Thank you, Mr. Chairman.

Chairman SMITH. Thank you, Ms. Bonamici.

The only amendment on the roster is a Manager's Amendment——

Mr. LUCAS. Mr. Chairman?

Chairman SMITH [continuing]. By the gentleman of Oklahoma, and he's recognized for purposes of offering that amendment.

Mr. LUCAS. Mr. Chairman, I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 5906 offered by Mr. Lucas of Oklahoma, amendment #008.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain his amendment.

Mr. LUCAS. Thank you, Mr. Chairman.

This amendment provides for technical changes to the legislation. I appreciate the opportunity to work with the Minority to identify these changes prior to today's markup and for their support on this important legislation.

I encourage my colleagues to vote for this amendment, and with that, I yield back, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Lucas.

Is there any further discussion on the amendment?

The gentlewoman from Texas, Ms. Johnson, is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. JOHNSON. Thank you.

I want to thank Mr. Lucas for offering the amendment, which I support. The amendment makes minor but helpful changes to the base bill. I urge my colleagues to support the amendment, and I yield back.

Chairman SMITH. Thank you, Ms. Johnson. This is going very quickly.

Is there any further discussion? Any further amendments?

If not, the question is on agreeing to the amendment offered by Mr. Lucas.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

If there is no—if there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 5906 as amended to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 5906 to the House as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the Motion to Reconsider is laid upon the table. H.R. 5906 is ordered reported to the House, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes, and without objection, so ordered.

I hope all Members will stay in the room just for a minute. I've got three announcements I'd like to make, so if you all will stay close by?

The first is to welcome our newest Member of the Science Committee, and that is Arizona's newest Member of the House, Debbie Lesko. She served in the Arizona House of Representatives for 6 years and then in the Arizona Senate, where she was President Pro Tem from 2017 to 2018. Representative Lesko has a keen interest in STEM education and the right kind of climate change. We look forward to having her expertise and perspective on the Committee. Welcome, Debbie.

Second announcement that particularly the Members to my right may be interested in knowing is that of the 32 bills this Committee has approved, 28 of the 32 are bipartisan and have been bipartisan bills. That's as good as it gets. OK.

And the last announcement is sort of a mixed announcement, and it is with gratitude for Molly Fromm's skills and with excitement for her next step that I have to announce that our General Counsel and the woman either sitting next to me or behind me will leave the Science Committee this Friday, day after tomorrow, after 3–1/2 years. Molly is a native of La Jolla, California, otherwise known as far west Texas. Before joining the Science Committee, Molly worked with my California colleague, Representative Darrell Issa, for a decade, first in his personal office and then as Deputy General Counsel and Parliamentarian for the Committee on Oversight and Government Reform. Molly has served the Science Committee tirelessly and well during the 114th and 115th Congresses. She understands Committee and House procedures. She works hard, and she has helped the Committee advance numerous pieces of legislation. Though we are sad to see her go, we're glad she won't be going far. Molly will take over as General Counsel and Parliamentarian for the House Financial Services Committee under my friend and Texas Colleague, Chairman Jed Hensarling. We wish Molly, her husband Adam, and her son, Patrick, who just turned one this past weekend, a happy future as they embark on

a new adventure. So Molly, we will miss you but we will continue to appreciate all your good work.

She—well, I'll stop there except that she has a great—look at her dress closely is all I can tell you. Those are wonderful red elephants. It's my—I used to have a tie that matched it but I don't know what I've done with it. I would have worn it today. But anyway, Molly, thank you again.

I thank all the Members for being here. I appreciate everybody's attendance, and we stand adjourned.

[Whereupon, at 11:20 a.m., the Committee was adjourned.]

Appendix:

H.R. 5905, AMENDMENT ROSTER, H.R. 5907, H.R. 5906, AMENDMENT ROSTER

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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To authorize basic research programs in the Department of Energy Office of Science for fiscal years 2018 and 2019.

IN THE HOUSE OF REPRESENTATIVES

Mr. WEBER of Texas introduced the following bill; which was referred to the Committee on _____

A BILL

To authorize basic research programs in the Department of Energy Office of Science for fiscal years 2018 and 2019.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Department of Energy Science and Innovation Act of 2018".

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents.
Sec. 2. Definitions.

Sec. 3. Mission.
Sec. 4. Basic energy sciences.
Sec. 5. Advanced scientific computing research.
Sec. 6. High energy physics.
Sec. 7. Biological and environmental research.
Sec. 8. Fusion energy.
Sec. 9. Nuclear physics.
Sec. 10. Science laboratories infrastructure program.
Sec. 11. Authorization of appropriations.

SEC. 2. DEFINITIONS.

In this Act:

(1) DEPARTMENT.—The term "Department" means the Department of Energy.

(2) DIRECTOR.—The term "Director" means the Director of the Office of Science of the Department.

(3) NATIONAL LABORATORY.—The term "National Laboratory" has the meaning given that term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(4) SECRETARY.—The term "Secretary" means the Secretary of Energy.

SEC. 3. MISSION.

Section 209 of the Department of Energy Organization Act (42 U.S.C. 7139) is amended by adding at the end the following:

"(c) MISSION.—The mission of the Office of Science shall be the delivery of scientific discoveries, capabilities, and major scientific tools to transform the understanding

1 of nature and to advance the energy, economic, and na-
2 tional security of the United States.".

3 **SEC. 4. BASIC ENERGY SCIENCES.**

4 (a) PROGRAM.—The Director shall carry out a pro-
5 gram in basic energy sciences, including materials sciences
6 and engineering, chemical sciences, physical biosciences,
7 and geosciences, for the purpose of providing the scientific
8 foundations for new energy technologies.

9 (b) MISSION.—The mission of the program described
10 in subsection (a) shall be to support fundamental research
11 to understand, predict, and ultimately control matter and
12 energy at the electronic, atomic, and molecular levels in
13 order to provide the foundations for new energy tech-
14 nologies and to support Department missions in energy,
15 environment, and national security.

16 (c) BASIC ENERGY SCIENCES USER FACILITIES.—

17 (1) IN GENERAL.—The Director shall carry out
18 a program for the development, construction, oper-
19 ation, and maintenance of national user facilities.

20 (2) REQUIREMENTS.—To the maximum extent
21 practicable, the national user facilities developed,
22 constructed, operated, or maintained under para-
23 graph (1) shall serve the needs of the Department,
24 industry, the academic community, and other rel-
25 evant entities to create and examine materials and

1 chemical processes for the purpose of improving the
2 competitiveness of the United States.
3 (3) INCLUDED FACILITIES.—The national user
4 facilities developed, constructed, operated, or main-
5 tained under paragraph (1) shall include—
6 (A) x-ray light sources;
7 (B) neutron sources;
8 (C) nanoscale science research centers; and
9 (D) such other facilities as the Director
10 considers appropriate, consistent with section
11 209 of the Department of Energy Organization
12 Act (42 U.S.C. 7139).
13 (d) BASIC ENERGY SCIENCES RESEARCH INFRA-
14 STRUCTURE.—
15 (1) ADVANCED PHOTON SOURCE UPGRADE.—
16 (A) IN GENERAL.—The Secretary shall
17 provide for the upgrade to the Advanced Pho-
18 ton Source described in the publication ap-
19 proved by the Basic Energy Sciences Advisory
20 Committee on June 9, 2016, titled "Report on
21 Facility Upgrades", including the development
22 of a multi-bend achromat lattice to produce a
23 high flux of coherent x-rays within the hard x-
24 ray energy region and a suite of beamlines opti-
25 mized for this source.

1 (B) DEFINITIONS.—In this paragraph:
2 (i) FLUX.—The term "flux" means
3 the rate of flow of photons.
4 (ii) HARD X-RAY.—The term "hard x-
5 ray" means a photon with energy greater
6 than 20 kiloelectron volts.
7 (C) START OF OPERATIONS.—The Sec-
8 retary shall, to the maximum extent practicable,
9 ensure that the start of full operations of the
10 upgrade under this paragraph occurs before De-
11 cember 31, 2025.
12 (D) FUNDING.—Out of funds authorized
13 to be appropriated under section 11 for Basic
14 Energy Sciences, there shall be made available
15 to the Secretary to carry out the upgrade under
16 this paragraph—
17 (i) $93,000,000 for fiscal year 2018;
18 and
19 (ii) $130,000,000 for fiscal year 2019.
20 (2) SPALLATION NEUTRON SOURCE PROTON
21 POWER UPGRADE.—
22 (A) IN GENERAL.—The Secretary shall
23 provide for a proton power upgrade to the
24 Spallation Neutron Source.

1 (B) DEFINITION OF PROTON POWER UP-
2 GRADE.—For the purposes of this paragraph,
3 the term "proton power upgrade" means the
4 Spallation Neutron Source power upgrade de-
5 scribed in—
6 (i) the publication of the Office of
7 Science of the Department of Energy titled
8 "Facilities for the Future of Science: A
9 Twenty-Year Outlook", published Decem-
10 ber 2003;
11 (ii) the publication of the Office of
12 Science of the Department of Energy titled
13 "Four Years Later: An Interim Report on
14 Facilities for the Future of Science: A
15 Twenty-Year Outlook", published August
16 2007; and
17 (iii) the publication approved by the
18 Basic Energy Sciences Advisory Committee
19 on June 9, 2016, titled "Report on Facil-
20 ity Upgrades".
21 (C) START OF OPERATIONS.—The Sec-
22 retary shall, to the maximum extent practicable,
23 ensure that the start of full operations of the
24 upgrade under this paragraph occurs before De-
25 cember 31, 2025.

1 (D) FUNDING.—Out of funds authorized
2 to be appropriated under section 11 for Basic
3 Energy Sciences, there shall be made available
4 to the Secretary to carry out the upgrade under
5 this paragraph—
6 (i) $36,000,000 for fiscal year 2018;
7 and
8 (ii) $60,800,000 for fiscal year 2019.
9 (3) SPALLATION NEUTRON SOURCE SECOND
10 TARGET STATION.—
11 (A) IN GENERAL.—The Secretary shall
12 provide for a second target station for the
13 Spallation Neutron Source.
14 (B) DEFINITION OF SECOND TARGET STA-
15 TION.—For the purposes of this paragraph, the
16 term "second target station" means the Spall-
17 ation Neutron Source second target station de-
18 scribed in—
19 (i) the publication of the Office of
20 Science of the Department of Energy titled
21 "Facilities for the Future of Science: A
22 Twenty-Year Outlook", published Decem-
23 ber 2003;
24 (ii) the publication of the Office of
25 Science of the Department of Energy titled

"Four Years Later: An Interim Report on Facilities for the Future of Science: A Twenty-Year Outlook", published August 2007; and

(iii) the publication approved by the Basic Energy Sciences Advisory Committee on June 9, 2016, titled "Report on Facility Upgrades".

(C) START OF OPERATIONS.—The Secretary shall, to the maximum extent practicable, ensure that the start of full operations of the second target station under this paragraph occurs before December 31, 2030, with the option for early operation in 2028.

(D) FUNDING.—Out of funds authorized to be appropriated under section 11 for Basic Energy Sciences, there shall be made available to the Secretary to carry out activities, including construction, under this paragraph—

(i) $5,000,000 for fiscal year 2018; and

(ii) $10,000,000 for fiscal year 2019.

(4) ADVANCED LIGHT SOURCE UPGRADE.—

(A) IN GENERAL.—The Secretary shall provide for the upgrade to the Advanced Light

1 Source described in the publication approved by
2 the Basic Energy Sciences Advisory Committee
3 on June 9, 2016, titled "Report on Facility Up-
4 grades", including the development of a multi-
5 bend achromat lattice to produce a high flux of
6 coherent x-rays within the soft x-ray energy re-
7 gion.
8 (B) DEFINITIONS.—In this paragraph:
9 (i) FLUX.—The term "flux" means
10 the rate of flow of photons.
11 (ii) SOFT X-RAY.—The term "soft x-
12 ray" means a photon with energy in the
13 range from 50 to 2,000 electron volts.
14 (C) START OF OPERATIONS.—The Sec-
15 retary shall, to the maximum extent practicable,
16 ensure that the start of full operations of the
17 upgrade under this paragraph occurs before De-
18 cember 31, 2026.
19 (D) FUNDING.—Out of funds authorized
20 to be appropriated under section 11 for Basic
21 Energy Sciences, there shall be made available
22 to the Secretary to carry out the upgrade under
23 this paragraph—
24 (i) $20,000,000 for fiscal year 2018;
25 and

1 (ii) $50,000,000 for fiscal year 2019.
2 (5) LINAC COHERENT LIGHT SOURCE II HIGH
3 ENERGY UPGRADE.—
4 (A) IN GENERAL.—The Secretary shall
5 provide for the upgrade to the Linac Coherent
6 Light Source II facility described in the publi-
7 cation approved by the Basic Energy Sciences
8 Advisory Committee on June 9, 2016, titled
9 "Report on Facility Upgrades", including the
10 development of experimental capabilities for
11 high energy x-rays to reveal fundamental sci-
12 entific discoveries. The Secretary shall ensure
13 the upgrade under this paragraph enables the
14 production and use of high energy, ultra-short
15 pulse x-rays delivered at a high repetition rate.
16 (B) DEFINITIONS.—In this paragraph:
17 (i) HIGH ENERGY X-RAY.—The term a
18 "high energy x-ray" means a photon with
19 an energy at or exceeding 12 kiloelectron
20 volts.
21 (ii) HIGH REPETITION RATE.—The
22 term "high repetition rate" means the de-
23 livery of x-ray pulses up to one million
24 pulses per second.

1 (iii) ULTRA-SHORT PULSE X-RAYS.—
2 The term "ultra-short pulse x-rays" means
3 x-ray bursts capable of durations of less
4 than one hundred femtoseconds.
5 (C) START OF OPERATIONS.—The Sec-
6 retary shall, to the maximum extent practicable,
7 ensure that the start of full operations of the
8 upgrade under this paragraph occurs before De-
9 cember 31, 2025.
10 (D) FUNDING.—Out of funds authorized
11 to be appropriated under section 11 for Basic
12 Energy Sciences, there shall be made available
13 to the Secretary to carry out the upgrade under
14 this paragraph—
15 (i) $20,000,000 for fiscal year 2018;
16 and
17 (ii) $55,000,000 for fiscal year 2019.
18 (e) ACCELERATOR RESEARCH AND DEVELOP-
19 MENT.—The Director shall carry out research and devel-
20 opment on advanced accelerator and storage ring tech-
21 nologies relevant to the development of Basic Energy
22 Sciences user facilities, in consultation with the Office of
23 Science's High Energy Physics and Nuclear Physics pro-
24 grams.
25 (f) SOLAR FUELS RESEARCH INITIATIVE.—

1 (1) IN GENERAL.—Section 973 of the Energy
2 Policy Act of 2005 (42 U.S.C. 16313) is amended
3 to read as follows:

4 **"SEC. 973. SOLAR FUELS RESEARCH INITIATIVE.**

5 "(a) INITIATIVE.—

6 "(1) IN GENERAL.—The Secretary shall carry
7 out a research initiative, to be known as the 'Solar
8 Fuels Research Initiative' (referred to in this section
9 as the 'Initiative') to expand theoretical and funda-
10 mental knowledge of photochemistry, electro-
11 chemistry, biochemistry, and materials science useful
12 for the practical development of experimental sys-
13 tems to convert solar energy to chemical energy.

14 "(2) LEVERAGING.—In carrying out programs
15 and activities under the Initiative, the Secretary
16 shall leverage expertise and resources from—

17 "(A) the Basic Energy Sciences Program
18 and the Biological and Environmental Research
19 Program of the Office of Science; and

20 "(B) the Office of Energy Efficiency and
21 Renewable Energy.

22 "(3) TEAMS.—

23 "(A) IN GENERAL.—In carrying out the
24 Initiative, the Secretary shall organize activities
25 among multidisciplinary teams to leverage, to

1 the maximum extent practicable, expertise from
2 the National Laboratories, institutions of higher
3 education, and the private sector.
4 "(B) GOALS.—The multidisciplinary teams
5 described in subparagraph (A) shall pursue ag-
6 gressive, milestone-driven, basic research goals.
7 "(C) RESOURCES.—The Secretary shall
8 provide sufficient resources to the multidisci-
9 plinary teams described in subparagraph (A) to
10 achieve the goals described in subparagraph (B)
11 over a period of time to be determined by the
12 Secretary.
13 "(4) ADDITIONAL ACTIVITIES.—The Secretary
14 may organize additional activities under this sub-
15 section through Energy Frontier Research Centers,
16 Energy Innovation Hubs, or other organizational
17 structures.
18 "(b) ARTIFICIAL PHOTOSYNTHESIS.—
19 "(1) IN GENERAL.—The Secretary shall carry
20 out under the Initiative a program to support re-
21 search needed to bridge scientific barriers to, and
22 discover knowledge relevant to, artificial photosyn-
23 thetic systems.
24 "(2) ACTIVITIES.—As part of the program de-
25 scribed in paragraph (1)—

1 "(A) the Director of the Office of Basic
2 Energy Sciences shall support basic research to
3 pursue distinct lines of scientific inquiry, in-
4 cluding—
5 "(i) photoinduced production of hy-
6 drogen and oxygen from water; and
7 "(ii) the sustainable photoinduced re-
8 duction of carbon dioxide to fuel products
9 including hydrocarbons, alcohols, carbon
10 monoxide, and natural gas; and
11 "(B) the Assistant Secretary for Energy
12 Efficiency and Renewable Energy shall support
13 translational research, development, and valida-
14 tion of physical concepts developed under the
15 program.
16 "(3) STANDARD OF REVIEW.—The Secretary
17 shall review activities carried out under the program
18 described in paragraph (1) to determine the achieve-
19 ment of technical milestones.
20 "(4) FUNDING.—
21 "(A) IN GENERAL.—From within funds
22 authorized to be appropriated under section 11
23 of the Department of Energy Science and Inno-
24 vation Act of 2018, for Basic Energy Sciences,
25 the Secretary shall make available for carrying

1 out activities under this subsection $50,000,000
2 for each of fiscal years 2018 through 2019.
3 "(B) PROHIBITION.—No funds allocated to
4 the program described in paragraph (1) may be
5 obligated or expended for commercial applica-
6 tion of energy technology.
7 "(c) BIOCHEMISTRY, REPLICATION OF NATURAL
8 PHOTOSYNTHESIS, AND RELATED PROCESSES.—
9 "(1) IN GENERAL.—The Secretary shall carry
10 out under the Initiative a program to support re-
11 search needed to replicate natural photosynthetic
12 processes by use of artificial photosynthetic compo-
13 nents and materials.
14 "(2) ACTIVITIES.—As part of the program de-
15 scribed in paragraph (1)—
16 "(A) the Director of the Office of Basic
17 Energy Sciences shall support basic research to
18 expand fundamental knowledge to replicate nat-
19 ural synthesis processes, including—
20 "(i) the photoinduced reduction of
21 dinitrogen to ammonia;
22 "(ii) the absorption of carbon dioxide
23 from ambient air;
24 "(iii) molecular-based charge separa-
25 tion and storage;

1 "(iv) photoinitiated electron transfer;
2 and
3 "(v) catalysis in biological or bio-
4 mimetic systems;
5 "(B) the Associate Director of Biological
6 and Environmental Research shall support sys-
7 tems biology and genomics approaches to un-
8 derstand genetic and physiological pathways
9 connected to photosynthetic mechanisms; and
10 "(C) the Assistant Secretary for Energy
11 Efficiency and Renewable Energy shall support
12 translational research, development, and valida-
13 tion of physical concepts developed under the
14 program.
15 "(3) STANDARD OF REVIEW.—The Secretary
16 shall review activities carried out under the program
17 described in paragraph (1) to determine the achieve-
18 ment of technical milestones.
19 "(4) FUNDING.—
20 "(A) IN GENERAL.—From within funds
21 authorized to be appropriated under section 11
22 of the Department of Energy Science and Inno-
23 vation Act of 2018, for Basic Energy Sciences
24 and Biological and Environmental Research,
25 the Secretary shall make available for carrying

1 out activities under this subsection $50,000,000
2 for each of fiscal years 2018 through 2019.
3 "(B) PROHIBITION.—No funds allocated to
4 the program described in paragraph (1) may be
5 obligated or expended for commercial applica-
6 tion of energy technology.".
7 (2) CONFORMING AMENDMENT.—The table of
8 contents for the Energy Policy Act of 2005 is
9 amended by striking the item relating to section 973
10 and inserting the following:

"Sec. 973. Solar fuels research initiative.".

11 (g) ELECTRICITY STORAGE RESEARCH INITIA-
12 TIVE.—
13 (1) IN GENERAL.—Section 975 of the Energy
14 Policy Act of 2005 (42 U.S.C. 16315) is amended
15 to read as follows:

16 **"SEC. 975. ELECTRICITY STORAGE RESEARCH INITIATIVE.**

17 "(a) INITIATIVE.—
18 "(1) IN GENERAL.—The Secretary shall carry
19 out a research initiative, to be known as the 'Elec-
20 tricity Storage Research Initiative' (referred to in
21 this section as the 'Initiative')—
22 "(A) to expand theoretical and funda-
23 mental knowledge to control, store, and con-
24 vert—

1 "(i) electrical energy to chemical en-
2 ergy; and
3 "(ii) chemical energy to electrical en-
4 ergy; and
5 "(B) to support scientific inquiry into the
6 practical understanding of chemical and phys-
7 ical processes that occur within systems involv-
8 ing crystalline and amorphous solids, polymers,
9 and organic and aqueous liquids.
10 "(2) LEVERAGING.—In carrying out programs
11 and activities under the Initiative, the Secretary
12 shall leverage expertise and resources from—
13 "(A) the Basic Energy Sciences Program,
14 the Advanced Scientific Computing Research
15 Program, and the Biological and Environmental
16 Research Program of the Office of Science; and
17 "(B) the Office of Energy Efficiency and
18 Renewable Energy.
19 "(3) TEAMS.—
20 "(A) IN GENERAL.—In carrying out the
21 Initiative, the Secretary shall organize activities
22 among multidisciplinary teams to leverage, to
23 the maximum extent practicable, expertise from
24 the National Laboratories, institutions of higher
25 education, and the private sector.

1 "(B) GOALS.—The multidisciplinary teams
2 described in subparagraph (A) shall pursue ag-
3 gressive, milestone-driven, basic research goals.
4 "(C) RESOURCES.—The Secretary shall
5 provide sufficient resources to the multidisci-
6 plinary teams described in subparagraph (A) to
7 achieve the goals described in subparagraph (B)
8 over a period of time to be determined by the
9 Secretary.
10 "(4) ADDITIONAL ACTIVITIES.—The Secretary
11 may organize additional activities under this sub-
12 section through Energy Frontier Research Centers,
13 Energy Innovation Hubs, or other organizational
14 structures.
15 "(b) MULTIVALENT SYSTEMS.—
16 "(1) IN GENERAL.—The Secretary shall carry
17 out under the Initiative a program to support re-
18 search needed to bridge scientific barriers to, and
19 discover knowledge relevant to, multivalent ion mate-
20 rials in electric energy storage systems.
21 "(2) ACTIVITIES.—As part of the program de-
22 scribed in paragraph (1)—
23 "(A) the Director of the Office of Basic
24 Energy Sciences shall investigate electro-
25 chemical properties and the dynamics of mate-

1 rials, including charge transfer phenomena and
2 mass transport in materials; and
3 "(B) the Assistant Secretary for Energy
4 Efficiency and Renewable Energy shall support
5 translational research, development, and valida-
6 tion of physical concepts developed under the
7 program.
8 "(3) STANDARD OF REVIEW.—The Secretary
9 shall review activities carried out under the program
10 described in paragraph (1) to determine the achieve-
11 ment of technical milestones.
12 "(4) FUNDING.—
13 "(A) IN GENERAL.—From within funds
14 authorized to be appropriated under section 11
15 of the Department of Energy Science and Inno-
16 vation Act of 2018, for Basic Energy Sciences
17 and Biological and Environmental Research,
18 the Secretary shall make available for carrying
19 out activities under this subsection $50,000,000
20 for each of the fiscal years 2018 through 2019.
21 "(B) PROHIBITION.—No funds allocated to
22 the program described in paragraph (1) may be
23 obligated or expended for commercial applica-
24 tion of energy technology.

1 "(c) ELECTROCHEMISTRY MODELING AND SIMULA-
2 TION.—
3 "(1) IN GENERAL.—The Secretary shall carry
4 out under the Initiative a program to support re-
5 search to model and simulate organic electrolytes,
6 including the static and dynamic electrochemical be-
7 havior and phenomena of organic electrolytes at the
8 molecular and atomic level in monovalent and multi-
9 valent systems.
10 "(2) ACTIVITIES.—As part of the program de-
11 scribed in paragraph (1)—
12 "(A) the Director of the Office of Basic
13 Energy Sciences, in coordination with the Asso-
14 ciate Director of Advanced Scientific Com-
15 puting Research, shall support the development
16 of high performance computational tools
17 through a joint development process to maxi-
18 mize the effectiveness of current and projected
19 high performance computing systems; and
20 "(B) the Assistant Secretary for Energy
21 Efficiency and Renewable Energy shall support
22 translational research, development, and valida-
23 tion of physical concepts developed under the
24 program.

1 "(3) STANDARD OF REVIEW.—The Secretary
2 shall review activities carried out under the program
3 described in paragraph (1) to determine the achieve-
4 ment of technical milestones.
5 "(4) FUNDING.—
6 "(A) IN GENERAL.—From within funds
7 authorized to be appropriated under section 11
8 of the Department of Energy Science and Inno-
9 vation Act of 2018, for Basic Energy Sciences
10 and Advanced Scientific Computing Research,
11 the Secretary shall make available for carrying
12 out activities under this subsection $30,000,000
13 for each of the fiscal years 2018 through 2019.
14 "(B) PROHIBITION.—No funds allocated to
15 the program described in paragraph (1) may be
16 obligated or expended for commercial applica-
17 tion of energy technology.
18 "(d) MESOSCALE ELECTROCHEMISTRY.—
19 "(1) IN GENERAL.—The Secretary shall carry
20 out under the Initiative a program to support re-
21 search needed to reveal electrochemistry in confined
22 mesoscale spaces, including scientific discoveries rel-
23 evant to—

1 "(A) bio-electrochemistry and electro-
2 chemical energy conversion and storage in con-
3 fined spaces; and
4 "(B) the dynamics of the phenomena de-
5 scribed in subparagraph (A).
6 "(2) ACTIVITIES.—As part of the program de-
7 scribed in paragraph (1)—
8 "(A) the Director of the Office of Basic
9 Energy Sciences and the Associate Director of
10 Biological and Environmental Research shall in-
11 vestigate phenomena of mesoscale electro-
12 chemical confinement for the purpose of repli-
13 cating and controlling new electrochemical be-
14 havior; and
15 "(B) the Assistant Secretary for Energy
16 Efficiency and Renewable Energy shall support
17 translational research, development, and valida-
18 tion of physical concepts developed under the
19 program.
20 "(3) STANDARD OF REVIEW.—The Secretary
21 shall review activities carried out under the program
22 described in paragraph (1) to determine the achieve-
23 ment of technical milestones.
24 "(4) FUNDING.—

1 "(A) IN GENERAL.—From within funds
2 authorized to be appropriated under section 11
3 of the Department of Energy Science and Inno-
4 vation Act of 2018, for Basic Energy Sciences
5 and Biological and Environmental Research,
6 the Secretary shall make available for carrying
7 out activities under this subsection $20,000,000
8 for each of fiscal years 2018 through 2019.
9 "(B) PROHIBITION.—No funds allocated to
10 the program described in paragraph (1) may be
11 obligated or expended for commercial applica-
12 tion of energy technology.".
13 (2) CONFORMING AMENDMENT.—The table of
14 contents for the Energy Policy Act of 2005 is
15 amended by striking the item relating to section 975
16 and inserting the following:

"Sec. 975. Electricity storage research initiative.".

17 (h) ENERGY FRONTIER RESEARCH CENTERS.—
18 (1) IN GENERAL.—The Director shall carry out
19 a program to provide awards, on a competitive,
20 merit-reviewed basis, to multi-institutional collabora-
21 tions or other appropriate entities to conduct funda-
22 mental and use-inspired energy research to accel-
23 erate scientific breakthroughs.

1 (2) COLLABORATIONS.—A collaboration receiv-
2 ing an award under this subsection may include mul-
3 tiple types of institutions and private sector entities.
4 (3) SELECTION AND DURATION.—
5 (A) IN GENERAL.—A collaboration under
6 this subsection shall be selected for a period of
7 4 years.
8 (B) EXISTING CENTERS.—An Energy
9 Frontier Research Center in existence and sup-
10 ported by the Director on the date of enactment
11 of this Act may continue to receive support for
12 a period of 4 years beginning on the date of es-
13 tablishment of that center.
14 (C) REAPPLICATION.—After the end of the
15 period described in subparagraph (A) or (B), as
16 applicable, a recipient of an award may reapply
17 for selection on a competitive, merit-reviewed
18 basis.
19 (D) TERMINATION.—Consistent with the
20 existing authorities of the Department, the Di-
21 rector may terminate an underperforming cen-
22 ter for cause during the performance period.
23 (i) MATERIALS RESEARCH DATABASE.—
24 (1) IN GENERAL.—As part of the program in
25 materials sciences and engineering, the Director

1 shall support the development of a web-based plat-
2 form to provide access to a database of computed in-
3 formation on known and predicted materials prop-
4 erties and computational tools to accelerate break-
5 throughs in materials discovery and design.
6 (2) In carrying out this section, the Director
7 shall—
8 (A) conduct cooperative research with in-
9 dustry, academia, and other research institu-
10 tions to facilitate the design of novel materials;
11 (B) leverage existing high performance
12 computing systems to conduct high-throughput
13 calculations, and develop computational and
14 data mining algorithms for the prediction of
15 material properties;
16 (C) advance understanding, prediction, and
17 manipulation of materials;
18 (D) strengthen the foundation for new
19 technologies and advanced manufacturing; and
20 (E) drive the development of advanced ma-
21 terials for applications that span the Depart-
22 ment's missions in energy, environment, and
23 national security.

1 (3) In carrying out this section, the Director
2 shall leverage programs and activities across the De-
3 partment.

4 **SEC. 5. ADVANCED SCIENTIFIC COMPUTING RESEARCH.**

5 (a) PROGRAM.—The Director shall carry out a re-
6 search, development, and demonstration program to ad-
7 vance computational and networking capabilities to ana-
8 lyze, model, simulate, and predict complex phenomena rel-
9 evant to the development of new energy technologies and
10 the competitiveness of the United States.

11 (b) AMERICAN SUPER COMPUTING LEADERSHIP.—

12 (1) RENAMING OF ACT.—

13 (A) IN GENERAL.—Section 1 of the De-
14 partment of Energy High-End Computing Revi-
15 talization Act of 2004 (15 U.S.C. 5501 note;
16 Public Law 108–423) is amended by striking
17 "Department of Energy High-End Computing
18 Revitalization Act of 2004" and inserting
19 "American Super Computing Leadership Act".

20 (B) CONFORMING AMENDMENT.—Section
21 976(a)(1) of the Energy Policy Act of 2005 (42
22 U.S.C. 16316(1)) is amended by striking "De-
23 partment of Energy High-End Computing Revi-
24 talization Act of 2004" and inserting "Amer-
25 ican Super Computing Leadership Act".

1 (2) DEFINITIONS.—Section 2 of the American
2 Super Computing Leadership Act (15 U.S.C. 5541),
3 as renamed by paragraph (1), is amended—
4 (A) by redesignating paragraphs (2)
5 through (5) as paragraphs (3) through (6), re-
6 spectively;
7 (B) by striking paragraph (1) and insert-
8 ing the following:
9 "(1) DEPARTMENT.—The term 'Department'
10 means the Department of Energy.
11 "(2) EXASCALE COMPUTING.—The term
12 'exascale computing' means computing through the
13 use of a computing machine that performs near or
14 above 10 to the 18th power operations per second.";
15 and
16 (C) in paragraph (6) (as redesignated by
17 subparagraph (A)), by striking ", acting
18 through the Director of the Office of Science of
19 the Department of Energy".
20 (3) DEPARTMENT OF ENERGY HIGH-END COM-
21 PUTING RESEARCH AND DEVELOPMENT PROGRAM.—
22 Section 3 of the American Super Computing Leader-
23 ship Act (15 U.S.C. 5542), as renamed by para-
24 graph (1), is amended—

1 (A) in subsection (a)(1), by striking "pro-
2 gram" and inserting "coordinated program
3 across the Department";
4 (B) in subsection (b)(2), by striking ",
5 which may" and all that follows through
6 "multithreading architectures"; and
7 (C) by striking subsection (d) and insert-
8 ing the following:
9 "(d) EXASCALE COMPUTING PROGRAM.—
10 "(1) IN GENERAL.—The Secretary shall con-
11 duct a research program (referred to in this sub-
12 section as the 'Program') for exascale computing, in-
13 cluding the development of two or more exascale
14 computing machine architectures, to promote the
15 missions of the Department.
16 "(2) EXECUTION.—
17 "(A) IN GENERAL.—In carrying out the
18 Program, the Secretary shall—
19 "(i) establish a National Laboratory
20 partnership for industry partners and in-
21 stitutions of higher education for codesign
22 of exascale hardware, technology, software,
23 and applications across all applicable orga-
24 nizations of the Department;

"(ii) acquire multiple exascale computing systems at the existing Departmental facilities that represent at least two distinct technology options developed under clause (i);

"(iii) develop such advancements in hardware and software technology as are required to fully realize the potential of an exascale production system in addressing Department target applications and solving scientific problems involving predictive modeling and simulation, large scale data analytics and management, and artificial intelligence;

"(iv) explore the use of exascale computing technologies to advance a broad range of science and engineering; and

"(v) provide, as appropriate, on a competitive, merit-reviewed basis, access for researchers in industries in the United States, institutions of higher education, National Laboratories, and other Federal agencies to the exascale computing systems developed pursuant to clause (i).

"(B) SELECTION OF PARTNERS.—The Secretary shall select the partnerships with the computing facilities of the Department under subparagraph (A) through a competitive, peer-review process.

"(3) CODESIGN AND APPLICATION DEVELOPMENT.—

"(A) IN GENERAL.—The Secretary shall—

"(i) carry out the Program through an integration of applications, computer science, applied mathematics, and computer hardware architecture using the partnerships established pursuant to paragraph (2) to ensure that, to the maximum extent practicable, two or more exascale computing machine architectures are capable of solving Department target applications and broader scientific problems, including predictive modeling and simulation, large scale data analytics and management, and artificial intelligence; and

"(ii) conduct outreach programs to increase the readiness for the use of such platforms by domestic industries, including manufacturers.

1 "(B) REPORT.—(i) The Secretary shall
2 submit to Congress a report describing how the
3 integration under subparagraph (A) is fur-
4 thering application science data and computa-
5 tional workloads across application interests, in-
6 cluding national security, material science,
7 physical science, cybersecurity, biological
8 science, the Materials Genome and BRAIN Ini-
9 tiatives of the President, advanced manufac-
10 turing, and the national electric grid.
11 "(ii) The roles and responsibilities of Na-
12 tional Laboratories and industry, including the
13 definition of the roles and responsibilities within
14 the Department to ensure an integrated pro-
15 gram across the Department.
16 "(4) PROJECT REVIEW.—
17 "(A) IN GENERAL.—The exascale architec-
18 tures developed pursuant to partnerships estab-
19 lished pursuant to paragraph (2) shall be re-
20 viewed through a project review process.
21 "(B) REPORT.—Not later than 90 days
22 after the date of enactment of this subsection,
23 the Secretary shall submit to Congress a report
24 on—

1 "(i) the results of the review con-
2 ducted under subparagraph (A); and
3 "(ii) the coordination and manage-
4 ment of the Program to ensure an inte-
5 grated research program across the De-
6 partment.
7 "(5) ANNUAL REPORTS.—At the time of the
8 budget submission of the Department for each fiscal
9 year, the Secretary, in consultation with the mem-
10 bers of the partnerships established pursuant to
11 paragraph (2), shall submit to Congress a report
12 that describes funding for the Program as a whole
13 by functional element of the Department and critical
14 milestones.".
15 (c) HIGH-PERFORMANCE COMPUTING AND NET-
16 WORKING RESEARCH.—The Director shall support re-
17 search in high-performance computing and networking rel-
18 evant to energy applications, including modeling, simula-
19 tion, machine learning, and advanced data analytics for
20 basic and applied energy research programs carried out
21 by the Secretary.
22 (d) APPLIED MATHEMATICS AND SOFTWARE DEVEL-
23 OPMENT FOR HIGH-END COMPUTING SYSTEMS, COM-
24 PUTATIONAL, AND COMPUTER SCIENCES RESEARCH.—

1 (1) IN GENERAL.—The Director shall carry out
2 activities to develop, test, and support—
3 (A) mathematics, models, statistics, and al-
4 gorithms for complex systems and programming
5 environments; and
6 (B) tools, languages, and operations for
7 high-end computing systems (as defined in sec-
8 tion 2 of the American Super Computing Lead-
9 ership Act (15 U.S.C. 5541), as renamed by
10 this section).
11 (2) PORTFOLIO BALANCE.—The Director shall
12 maintain a balanced portfolio within the advanced
13 scientific computing research and development pro-
14 gram established under section 976 of the Energy
15 Policy Act of 2005 (42 U.S.C. 16316) that supports
16 robust investment in applied mathematical, com-
17 putational, and computer sciences research while ac-
18 commodating necessary investments in high-perform-
19 ance computing hardware and facilities.
20 (e) WORKFORCE DEVELOPMENT.—The Director of
21 the Office of Advanced Scientific Computing Research
22 shall support the development of a computational science
23 workforce through a program that—

1 (1) facilitates collaboration between university
2 students and researchers at the National Labora-
3 tories; and
4 (2) endeavors to advance science in areas rel-
5 evant to the mission of the Department through the
6 application of computational science.

7 **SEC. 6. HIGH ENERGY PHYSICS.**

8 (a) PROGRAM.—The Director shall carry out a re-
9 search program on the fundamental constituents of matter
10 and energy and the nature of space and time.
11 (b) MISSION.—The mission of the program described
12 in subsection (a) shall be to support theoretical and experi-
13 mental research in both elementary particle physics and
14 fundamental accelerator science and technology to under-
15 stand fundamental properties of the universe.
16 (c) SENSE OF CONGRESS.—It is the sense of the Con-
17 gress that—
18 (1) the Director should incorporate the findings
19 and recommendations of the Particle Physics Project
20 Prioritization Panel's report entitled "Building for
21 Discovery: Strategic Plan for U.S. Particle Physics
22 in the Global Context", into the Department's plan-
23 ning process as part of the program described in
24 subsection (a);

1 (2) the Director should prioritize domestically
2 hosted research projects that will maintain the
3 United States position as a global leader in particle
4 physics and attract the world's most talented physi-
5 cists and foreign investment for international col-
6 laboration; and
7 (3) the nations that lead in particle physics by
8 hosting international teams dedicated to a common
9 scientific goal attract the world's best talent and in-
10 spire future generations of physicists and tech-
11 nologists.
12 (d) NEUTRINO RESEARCH.—As part of the program
13 described in subsection (a), the Director shall carry out
14 research activities on rare decay processes and the nature
15 of the neutrino, which may include collaborations with the
16 National Science Foundation or international collabora-
17 tions.
18 (e) LONG-BASELINE NEUTRINO FACILITY FOR DEEP
19 UNDERGROUND NEUTRINO EXPERIMENT.—
20 (1) IN GENERAL.—The Secretary shall provide
21 for a Long-Baseline Neutrino Facility to facilitate
22 the international Deep Underground Neutrino Ex-
23 periment to enable a program in neutrino physics to
24 measure the fundamental properties of neutrinos, ex-

1 plore physics beyond the Standard Model, and better
2 clarify the nature of matter and antimatter.
3 (2) FACILITY CAPABILITIES.—The Secretary
4 shall ensure that the facility described in paragraph
5 (1) will provide, at a minimum, the following capa-
6 bilities:
7 (A) A broad-band neutrino beam capable
8 of 1.2 megawatts (MW) of beam power and
9 upgradable to 2.4 MW of beam power.
10 (B) Four caverns excavated for a forty kil-
11 oton fiducial detector mass and supporting sur-
12 face buildings and utilities.
13 (C) Neutrino detector facilities at both the
14 Far Site in South Dakota and the Near Site in
15 Illinois to categorize and study neutrinos on
16 their 800-mile journey between the two sites.
17 (D) Cryogenic systems to support neutrino
18 detectors.
19 (3) START OF OPERATIONS.—The Secretary
20 shall, to the maximum extent practicable, ensure
21 that the start of full operations of the facility under
22 this subsection occurs before December 31, 2026.
23 (4) FUNDING.—Out of funds authorized to be
24 appropriated under section 11 for High Energy
25 Physics, there shall be made available to the Sec-

1 retary to carry out activities, including construction
2 of the facility, under this subsection—
3 (A) $95,000,000 for fiscal year 2018; and
4 (B) $175,000,000 for fiscal year 2019.
5 (5) DARK ENERGY AND DARK MATTER RE-
6 SEARCH.—As part of the program described in para-
7 graph (1), the Director shall carry out research ac-
8 tivities on the nature of dark energy and dark mat-
9 ter, which may include collaborations with the Na-
10 tional Aeronautics and Space Administration or the
11 National Science Foundation, or international col-
12 laborations.
13 (6) INTERNATIONAL COLLABORATION.—The
14 Director, as practicable and in coordination with
15 other appropriate Federal agencies as necessary,
16 shall ensure the access of United States researchers
17 to the most advanced accelerator facilities and re-
18 search capabilities in the world, including the Large
19 Hadron Collider.
20 **SEC. 7. BIOLOGICAL AND ENVIRONMENTAL RESEARCH.**
21 (a) PROGRAM.—The Director shall carry out a pro-
22 gram of basic research in the areas of biological systems
23 science and environmental science relevant to the develop-
24 ment of new energy technologies and to support Depart-

1 ment missions in energy, environment, and national secu-
2 rity.
3 (b) BIOLOGICAL SYSTEMS.—The Director shall carry
4 out research and development activities in fundamental,
5 structural, computational, and systems biology to increase
6 systems-level understanding of the complex biological sys-
7 tems, which may include activities—
8 (1) to accelerate breakthroughs and new knowl-
9 edge that would enable the cost-effective, sustainable
10 production of—
11 (A) biomass-based liquid transportation
12 fuels;
13 (B) bioenergy; and
14 (C) biobased materials;
15 (2) to improve understanding of the global car-
16 bon cycle, including processes for removing carbon
17 dioxide from the atmosphere, through photosynthesis
18 and other biological processes, for sequestration and
19 storage; and
20 (3) to understand the biological mechanisms
21 used to transform, immobilize, or remove contami-
22 nants from subsurface environments.
23 (c) BIOENERGY RESEARCH CENTERS.—
24 (1) IN GENERAL.—In carrying out activities
25 under subsection (a), the Director shall select and

1 establish up to 4 bioenergy research centers to con-
2 duct basic and fundamental research in plant and
3 microbial systems biology, bio imaging and analysis,
4 and genomics to inform the production of fuels,
5 chemicals from sustainable biomass resources, and
6 to facilitate the translation of basic research results
7 to industry.
8 (2) SELECTION.—The Director shall select cen-
9 ters under paragraph (1) on a competitive, merit-re-
10 viewed basis. The Director shall consider applica-
11 tions from National Laboratories, multi-institutional
12 collaborations, and other appropriate entities.
13 (3) DURATION.—A center established under
14 this subsection shall receive support for a period of
15 not more than 5 years, subject to the availability of
16 appropriations.
17 (4) EXISTING CENTERS.—The Director may se-
18 lect a center for participation under this subsection
19 that is in existence, or undergoing a renewal process,
20 on the date of enactment of this Act. Such center
21 shall be eligible to receive support for the duration
22 the 5-year period beginning on the date of establish-
23 ment of such center.
24 (5) RENEWAL.—Upon the expiration of any pe-
25 riod of support of a center under this subsection, the

1 Director may renew support for the center, on a
2 merit-reviewed basis, for a period of not more than
3 5 years.
4 (6) TERMINATION.—Consistent with the exist-
5 ing authorities of the Department, the Director may
6 terminate an underperforming center for cause dur-
7 ing the performance period.
8 (d) LOW DOSE RADIATION RESEARCH PROGRAM.—
9 (1) IN GENERAL.—Subtitle G of title IX of the
10 Energy Policy Act of 2005 (42 U.S.C. 16311 et
11 seq.) is amended by inserting after section 977 the
12 following new section:
13 **"SEC. 977A. LOW-DOSE RADIATION RESEARCH PROGRAM.**
14 "(a) IN GENERAL.—The Secretary shall carry out a
15 basic research program on low-dose radiation to—
16 "(1) enhance the scientific understanding of,
17 and reduce uncertainties associated with, the effects
18 of exposure to low-dose radiation; and
19 "(2) inform improved risk-assessment and risk-
20 management methods with respect to such radiation.
21 "(b) PROGRAM COMPONENTS.—In carrying out the
22 program required under subsection (a), the Secretary
23 shall—
24 "(1) formulate scientific goals for low-dose radi-
25 ation basic research in the United States;

1 "(2) identify ongoing scientific challenges for
2 understanding the long-term effects of ionizing radi-
3 ation on biological systems;
4 "(3) develop a long-term strategic and
5 prioritized basic research agenda to address such
6 scientific challenges in coordination with other re-
7 search efforts;
8 "(4) leverage the collective body of knowledge
9 from existing low-dose radiation research; and
10 "(5) engage with other Federal agencies, re-
11 search communities, and potential users of informa-
12 tion produced under this section, including institu-
13 tions concerning radiation research, medical physics,
14 radiology, health physics, and emergency response.
15 "(c) COORDINATION.—In carrying out the program,
16 the Secretary, in coordination with the Physical Science
17 Subcommittee of the National Science and Technology
18 Council, shall—
19 "(1) support the directives under section 106 of
20 the American Innovation and Competitiveness Act
21 (42 U.S.C. 6601 note);
22 "(2) ensure that the Office of Science of the
23 Department of Energy consults with the National
24 Aeronautics and Space Administration, the National
25 Institutes of Health, the Environmental Protection

1 Agency, the Department of Defense, the Nuclear
2 Regulatory Commission, and the Department of
3 Homeland Security;
4 "(3) advise and assist the National Science and
5 Technology Council on policies and initiatives in ra-
6 diation biology, including enhancing scientific knowl-
7 edge of the effects of low-dose radiation on biological
8 systems to improve radiation risk-assessment and
9 risk-management methods; and
10 "(4) identify opportunities to stimulate inter-
11 national cooperation relating to low-dose radiation
12 and leverage research and knowledge from sources
13 outside of the United States.
14 "(d) RESEARCH PLAN.—Not later than 180 days
15 after the date of enactment of this Act, the Secretary shall
16 transmit to the Committee on Science, Space, and Tech-
17 nology of the House of Representatives and the Committee
18 on Energy and Natural Resources of the Senate a 4-year
19 research plan that identifies and prioritizes basic research
20 needs relating to low-dose radiation. In developing such
21 plan, the Secretary shall incorporate the components de-
22 scribed in subsection (b).
23 "(e) DEFINITION OF LOW-DOSE RADIATION.—In this
24 section, the term 'low-dose radiation' means a radiation
25 dose of less than 100 millisieverts.

1 "(f) RULE OF CONSTRUCTION.—Nothing in this sec-
2 tion shall be construed to subject any research carried out
3 by the Secretary for the program under this section to
4 any limitations described in 977(e) of the Energy Policy
5 Act of 2005 (42 U.S.C. 16317(e)).

6 "(g) FUNDING.—From within funds authorized to be
7 appropriated under section 11 of the Department of En-
8 ergy Science and Innovation Act of 2018, for Biological
9 and Environmental Research, the Secretary make avail-
10 able to carry out this section—

11 "(1) $20,000,000 for fiscal year 2018; and

12 "(2) $20,000,000 for fiscal year 2019.".

13 (2) CONFORMING AMENDMENT.—The table of
14 contents for subtitle G of title IX of the Energy Pol-
15 icy Act of 2005 is amended by inserting after the
16 item relating to section 977 the following:

"977A. Low-dose radiation research program.".

17 (e) LIMITATION FOR RESEARCH FUNDS.—The Direc-
18 tor shall not approve new climate science-related initia-
19 tives without making a determination that such work is
20 well-coordinated with any relevant work carried out by
21 other Federal agencies.

22 **SEC. 8. FUSION ENERGY.**

23 (a) PROGRAM.—The Director shall carry out a fusion
24 energy sciences research program to expand the under-
25 standing of plasmas and matter at very high temperatures

1 and densities and build the science and engineering foun-
2 dation needed to develop a fusion energy source.
3 (b) INERTIAL FUSION ENERGY RESEARCH AND DE-
4 VELOPMENT PROGRAM.—The Secretary shall carry out a
5 program of research and technology development in iner-
6 tial fusion for energy applications, including ion beam,
7 laser, and pulsed power fusion systems.
8 (c) TOKAMAK RESEARCH AND DEVELOPMENT.—
9 (1) IN GENERAL.—The Director shall support
10 research and development activities and facility oper-
11 ations to optimize the tokamak approach to fusion
12 energy.
13 (2) INTERNATIONAL THERMONUCLEAR EXPERI-
14 MENTAL REACTOR CONSTRUCTION.—Section 972 of
15 the Energy Policy Act of 2005 (42 U.S.C. 16312)
16 is amended by adding section the following new
17 paragraph:
18 "(6) ITER CONSTRUCTION.—
19 "(A) IN GENERAL.—There is authorized
20 United States participation in the construction
21 and operations of the ITER project, as agreed
22 to under the April 25, 2007 'Agreement on the
23 Establishment of the ITER International Fu-
24 sion Energy Organization for the Joint Imple-
25 mentation of the ITER Project.'.

"(B) FACILITY REQUIREMENTS.—The Secretary shall ensure that the mission-oriented user facility will enable the study of a burning plasma, and shall be built to have the following characteristics in its full configuration:

"(i) A tokamak device with a plasma radius of 6.2 meters and a magnetic field of 5.3 T.

"(ii) Capable of creating and sustaining a 15-million-Ampere plasma current for greater than 300 seconds.

"(c) AUTHORIZATION OF APPROPRIATIONS.—From within funds authorized to be appropriated under section 11 of the Department of Energy Science and Innovation Act of 2018, for Fusion Energy Sciences, there is authorized for in-kind contributions under this section—

"(1) $122,000,000 for fiscal year 2018; and

"(2) $163,000,000 for fiscal year 2019.

"(d) AUTHORIZATION OF APPROPRIATIONS.—From within funds authorized to be appropriated under section 11 of the Department of Energy Science and Innovation Act of 2018, for Fusion Energy Sciences, there is authorized for cash contributions under this section—

"(1) $50,000,000 for fiscal year 2018; and

"(2) $50,000,000 for fiscal year 2019.".

1 (d) INERTIAL FUSION ENERGY RESEARCH AND DE-
2 VELOPMENT.—The Director shall support research and
3 development activities for inertial fusion for energy appli-
4 cations.
5 (e) ALTERNATIVE AND ENABLING CONCEPTS.—
6 (1) IN GENERAL.—As part of the program de-
7 scribed in subsection (a), the Director shall support
8 research and development activities and facility oper-
9 ations at United States universities, national labora-
10 tories, and private facilities for a portfolio of alter-
11 native and enabling fusion energy concepts that may
12 provide solutions to significant challenges to the es-
13 tablishment of a commercial magnetic fusion power
14 plant, prioritized based on the ability of the United
15 States to play a leadership role in the international
16 fusion research community. Fusion energy concepts
17 and activities explored under this paragraph may in-
18 clude—
19 (A) high magnetic field approaches facili-
20 tated by high temperature superconductors;
21 (B) advanced stellarator concepts;
22 (C) non-tokamak confinement configura-
23 tions operating at low magnetic fields;
24 (D) magnetized target fusion energy con-
25 cepts;

1 (E) liquid metals to address issues associ-
2 ated with fusion plasma interactions with the
3 inner wall of the encasing device;
4 (F) immersion blankets for heat manage-
5 ment and fuel breeding;
6 (G) advanced scientific computing activi-
7 ties; and
8 (H) other promising fusion energy con-
9 cepts identified by the Director.
10 (2) COORDINATION WITH ARPA–E.—The Under
11 Secretary and the Director shall coordinate with the
12 Director of the Advanced Research Projects Agency–
13 Energy (in this paragraph referred to as "ARPA–
14 E") to—
15 (A) assess the potential for any fusion en-
16 ergy project supported by ARPA–E to rep-
17 resent a promising approach to a commercially
18 viable fusion power plant;
19 (B) determine whether the results of any
20 fusion energy project supported by ARPA–E
21 merit the support of follow-on research activi-
22 ties carried out by the Office of Science; and
23 (C) avoid unintentional duplication of ac-
24 tivities.

1 (f) COORDINATION WITH ARPA–E.—The Director
2 shall coordinate with the Director of the Advanced Re-
3 search Projects Agency-Energy (referred to in this sub-
4 section as "ARPA–E") to—
5 (1) assess the potential for any fusion energy
6 project supported by ARPA–E to represent a prom-
7 ising approach to a commercially viable fusion power
8 plant;
9 (2) determine whether the results of any fusion
10 energy project supported by ARPA–E merit the sup-
11 port of follow-on research activities carried out by
12 the Office of Science; and
13 (3) avoid the unintentional duplication of activi-
14 ties.
15 (g) FAIRNESS IN COMPETITION FOR SOLICITATIONS
16 FOR INTERNATIONAL PROJECT ACTIVITIES.—Section 33
17 of the Atomic Energy Act of 1954 (42 U.S.C. 2053) is
18 amended by inserting before the first sentence the fol-
19 lowing: "In this section, with respect to international re-
20 search projects, the term 'private facilities or laboratories'
21 means facilities or laboratories located in the United
22 States.".
23 (h) IDENTIFICATION OF PRIORITIES.—
24 (1) REPORT.—

1 (A) IN GENERAL.—Not later than 2 years
2 after the date of enactment of this Act, the Sec-
3 retary shall submit to Congress a report on the
4 fusion energy research and development activi-
5 ties that the Department proposes to carry out
6 over the 10-year period following the date of
7 the report under not fewer than 3 realistic
8 budget scenarios, including a scenario based on
9 3-percent annual growth in the non-ITER por-
10 tion of the budget for fusion energy research
11 and development activities.
12 (B) INCLUSIONS.—The report required
13 under subparagraph (A) shall—
14 (i) identify specific areas of fusion en-
15 ergy research and enabling technology de-
16 velopment, including activities to advance
17 inertial and alternative fusion energy con-
18 cepts, in which the United States can and
19 should establish or solidify a lead in the
20 global fusion energy development effort;
21 (ii) identify priorities for initiation of
22 facility construction and facility decommis-
23 sioning under each of the three budget sce-
24 narios described in subparagraph (A); and

(iii) assess the ability of the fusion workforce of the United States to carry out the activities identified under clauses (i) and (ii), including the adequacy of programs at institutions of higher education in the United States to train the leaders and workers of the next generation of fusion energy researchers.

(2) PROCESS.—In order to develop the report required under paragraph (1)(A), the Secretary shall leverage best practices and lessons learned from the process used to develop the most recent report of the Particle Physics Project Prioritization Panel of the High Energy Physics Advisory Panel.

(3) REQUIREMENT.—No member of the Fusion Energy Sciences Advisory Committee shall be excluded from participating in developing or voting on final approval of the report required under paragraph (1)(A).

SEC. 9. NUCLEAR PHYSICS.

(a) PROGRAM.—The Director shall carry out a program of experimental and theoretical research, and support associated facilities, to discover, explore, and understand all forms of nuclear matter.

1 (b) ISOTOPE DEVELOPMENT AND PRODUCTION FOR
2 RESEARCH APPLICATIONS.—The Director—
3 (1) may carry out a program for the production
4 of isotopes, including the development of techniques
5 to produce isotopes, that the Secretary determines
6 are needed for research, medical, industrial, or re-
7 lated purposes; and
8 (2) shall ensure that isotope production activi-
9 ties carried out under the program under this para-
10 graph do not compete with private industry unless
11 the Director determines that critical national inter-
12 ests require the involvement of the Federal Govern-
13 ment.
14 (c) RENAMING OF THE RARE ISOTOPE ACCEL-
15 ERATOR.—Section 981 of the Energy Policy Act of 2005
16 (42 U.S.C. 16321) is amended—
17 (1) in the section heading, by striking "**RARE**
18 **ISOTOPE ACCELERATOR**" and inserting "**FACIL-**
19 **ITY FOR RARE ISOTOPE BEAMS**"; and
20 (2) by striking "Rare Isotope Accelerator" each
21 place it appears and inserting "Facility for Rare Iso-
22 tope Beams".
23 (d) FACILITY FOR RARE ISOTOPE BEAMS.—
24 (1) IN GENERAL.—The Secretary shall provide
25 for a Facility for Rare Isotope Beams to advance the

1 understanding of rare nuclear isotopes and the evo-
2 lution of the cosmos.
3 (2) FACILITY CAPABILITY.—In carrying out
4 paragraph (1), the Secretary shall provide for, at a
5 minimum, a rare isotope beam facility capable of
6 400 kW of beam power.
7 (3) START OF OPERATIONS.—The Secretary
8 shall, to the maximum extent practicable, ensure
9 that the start of full operations of the facility under
10 this subsection occurs before June 30, 2022, with
11 early operation in 2018.
12 (4) FUNDING.—Out of funds authorized to be
13 appropriated under section 11 for Nuclear Physics,
14 there shall be made available to the Secretary to
15 carry out activities, including construction of the fa-
16 cility, under this subsection—
17 (A) $101,200,000 for fiscal year 2018; and
18 (B) $86,000,000 for fiscal year 2019.
19 **SEC. 10. SCIENCE LABORATORIES INFRASTRUCTURE PRO-**
20 **GRAM.**
21 (a) IN GENERAL.—The Director shall carry out a
22 program to improve the safety, efficiency, and mission
23 readiness of infrastructure at Office of Science labora-
24 tories. The program shall include projects to—

1 (1) renovate or replace space that does not
2 meet research needs;
3 (2) replace facilities that are no longer cost ef-
4 fective to renovate or operate;
5 (3) modernize utility systems to prevent failures
6 and ensure efficiency;
7 (4) remove excess facilities to allow safe and ef-
8 ficient operations; and
9 (5) construct modern facilities to conduct ad-
10 vanced research in controlled environmental condi-
11 tions.
12 (b) APPROACH.—In carrying out this section, the Di-
13 rector shall utilize all available approaches and mecha-
14 nisms, including capital line items, minor construction
15 projects, energy savings performance contracts, utility en-
16 ergy service contracts, alternative financing, and expense
17 funding, as appropriate.
18 **SEC. 11. AUTHORIZATION OF APPROPRIATIONS.**
19 (a) FISCAL YEAR 2018.—There are authorized to be
20 appropriated to the Secretary for the Office of Science for
21 fiscal year 2018 $6,259,903,000, of which—
22 (1) $2,090,000,000 shall be for Basic Energy
23 Science;
24 (2) $908,000,000 shall be for High Energy
25 Physics;

1 (3) $673,000,000 shall be for Biological and
2 Environmental Research;
3 (4) $684,000,000 shall be for Nuclear Physics;
4 (5) $810,000,000 shall be for Advanced Sci-
5 entific Computing Research;
6 (6) $532,111,000 shall be for Fusion Energy
7 Sciences;
8 (7) $257,292,000 shall be for Science Labora-
9 tories Infrastructure;
10 (8) $183,000,000 shall be for Science Program
11 Direction;
12 (9) $103,000,000 shall be for Safeguards and
13 Security; and
14 (10) $19,500,000 shall be for Workforce Devel-
15 opment for Teachers and Scientists.
16 (b) FISCAL YEAR 2019.—There are authorized to be
17 appropriated to the Secretary for the Office of Science for
18 fiscal year 2019 $6,600,000,000, of which—
19 (1) $2,129,233,000 shall be for Basic Energy
20 Science;
21 (2) $1,004,510,000 shall be for High Energy
22 Physics;
23 (3) $673,000,000 shall be for Biological and
24 Environmental Research;
25 (4) $690,000,000 shall be for Nuclear Physics;

1 (5) $899,010,000 shall be for Advanced Sci-
2 entific Computing Research;
3 (6) $640,000,000 shall be for Fusion Energy
4 Sciences;
5 (7) $257,292,000 shall be for Science Labora-
6 tories Infrastructure;
7 (8) $181,345,000 shall be for Science Program
8 Direction;
9 (9) $106,110,000 shall be for Safeguards and
10 Security; and
11 (10) $19,500,000 shall be for Workforce Devel-
12 opment for Teachers and Scientists.

AMENDMENT TO DEPARTMENT OF ENERGY SCIENCE AND INNOVATION ACT OF 2018 OFFERED BY MR. WEBER OF TEXAS

Page 44, line 17, insert the following new subsection (and redesignate succeeding subsections accordingly):

1 (e) MODELING RESEARCH.—As part of the activities
2 described in subsection (a), the Director is authorized to
3 carry out research to develop multiscale computational
4 models that incorporate and examine interactions among
5 human and earth systems.

Page 47, strike lines 1 through 4 (and redesignate succeeding subsections accordingly).

Page 49, strike lines 1 through 14 (and redesignate the succeeding subsection accordingly).

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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To provide directors of the National Laboratories signature authority for certain agreements, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. HULTGREN introduced the following bill; which was referred to the Committee on _____

A BILL

To provide directors of the National Laboratories signature authority for certain agreements, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Innovation Modernization by Laboratory Empowerment Act" or the "NIMBLE Act".

SEC. 2. DEFINITIONS.

In this Act:

1 (1) DEPARTMENT.—The term "Department"
2 means the Department of Energy.
3 (2) NATIONAL LABORATORY.—The term "Na-
4 tional Laboratory" means a Department of Energy
5 nonmilitary national laboratory, including—
6 (A) Ames Laboratory;
7 (B) Argonne National Laboratory;
8 (C) Brookhaven National Laboratory;
9 (D) Fermi National Accelerator Labora-
10 tory;
11 (E) Idaho National Laboratory;
12 (F) Lawrence Berkeley National Labora-
13 tory;
14 (G) National Energy Technology Labora-
15 tory;
16 (H) National Renewable Energy Labora-
17 tory;
18 (I) Oak Ridge National Laboratory;
19 (J) Pacific Northwest National Labora-
20 tory;
21 (K) Princeton Plasma Physics Laboratory;
22 (L) Savannah River National Laboratory;
23 (M) Stanford Linear Accelerator Center;
24 (N) Thomas Jefferson National Accel-
25 erator Facility; and

1 (O) any laboratory operated by the Na-
2 tional Nuclear Security Administration, but
3 only with respect to the civilian energy activities
4 thereof.
5 (3) SECRETARY.—The term "Secretary" means
6 the Secretary of Energy.

7 **SEC. 3. PUBLIC-PRIVATE PARTNERSHIPS FOR COMMER-**
8 **CIALIZATION.**

9 (a) IN GENERAL.—Subject to subsections (b) and (c),
10 the Secretary shall delegate to directors of the National
11 Laboratories signature authority with respect to any
12 agreement described in subsection (b) the total cost of
13 which (including the National Laboratory contributions
14 and project recipient cost share) is less than $1,000,000,
15 if such an agreement falls within the scope of—
16 (1) a strategic plan for the National Laboratory
17 that has been approved by the Department; or
18 (2) the most recent Congressionally approved
19 budget for Department activities to be carried out by
20 the National Laboratory.
21 (b) AGREEMENTS.—Subsection (a) applies to—
22 (1) a cooperative research and development
23 agreement;
24 (2) a non-Federal work-for-others agreement;
25 and

1 (3) any other agreement determined to be ap-
2 propriate by the Secretary, in collaboration with the
3 directors of the National Laboratories.
4 (c) ADMINISTRATION.—
5 (1) ACCOUNTABILITY.—The director of the af-
6 fected National Laboratory and the affected con-
7 tractor shall carry out an agreement under this sec-
8 tion in accordance with applicable policies of the De-
9 partment, including by ensuring that the agreement
10 does not compromise any national security, eco-
11 nomic, or environmental interest of the United
12 States.
13 (2) CERTIFICATION.—The director of the af-
14 fected National Laboratory and the affected con-
15 tractor shall certify that each activity carried out
16 under a project for which an agreement is entered
17 into under this section does not present, or mini-
18 mizes, any apparent conflict of interest, and avoids
19 or neutralizes any actual conflict of interest, as a re-
20 sult of the agreement under this section.
21 (3) AVAILABILITY OF RECORDS.—Within 30
22 days of entering an agreement under this section,
23 the director of a National Laboratory shall submit
24 to the Secretary for monitoring and review all

1 records of the National Laboratory relating to the
2 agreement.
3 (4) RATES.—The director of a National Lab-
4 oratory may charge higher rates for services per-
5 formed under a partnership agreement entered into
6 pursuant to this section, regardless of the full cost
7 of recovery, if such funds are used exclusively to
8 support further research and development activities
9 at the respective National Laboratory.
10 (d) EXCEPTION.—This section does not apply to any
11 agreement with a majority foreign-owned company.
12 (e) CONFORMING AMENDMENT.—Section 12 of the
13 Stevenson-Wydler Technology Innovation Act of 1980 (15
14 U.S.C. 3710a) is amended—
15 (1) in subsection (a)—
16 (A) by redesignating paragraphs (1) and
17 (2) as subparagraphs (A) and (B), respectively,
18 and indenting the subparagraphs appropriately;
19 (B) by striking "Each Federal agency"
20 and inserting the following:
21 "(1) IN GENERAL.—Except as provided in para-
22 graph (2), each Federal agency"; and
23 (C) by adding at the end the following:
24 "(2) EXCEPTION.—Notwithstanding paragraph
25 (1), in accordance with section 3(a) of the NIMBLE

1 Act, approval by the Secretary of Energy shall not
2 be required for any technology transfer agreement
3 proposed to be entered into by a National Labora-
4 tory of the Department of Energy, the total cost of
5 which (including the National Laboratory contribu-
6 tions and project recipient cost share) is less than
7 $1,000,000."; and
8 (2) in subsection (b), by striking "subsection
9 (a)(1)" each place it appears and inserting "sub-
10 section (a)(1)(A)".

11 **SEC. 4. SAVINGS CLAUSE.**

12 Nothing in this Act or an amendment made by this
13 Act abrogates or otherwise affects the primary responsibil-
14 ities of any National Laboratory to the Department.

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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To amend the America COMPETES Act to establish Department of Energy policy for Advanced Research Projects Agency-Energy, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. LUCAS introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the America COMPETES Act to establish Department of Energy policy for Advanced Research Projects Agency-Energy, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "ARPA-E Act of 2018".

SEC. 2. ADVANCED RESEARCH PROJECTS AGENCY-ENERGY.

(a) ESTABLISHMENT.—Section 5012(b) of the America COMPETES Act (42 U.S.C. 16538(b)) is amended

1 by striking "development of energy technologies" and in-
2 serting "development of transformative science and tech-
3 nology solutions to address energy, environmental, eco-
4 nomic, and national security challenges".
5 (b) GOALS.—Section 5012(c) of such Act (42 U.S.C.
6 16538(c)) is amended—
7 (1) by striking paragraph (1)(A) and inserting
8 the following:
9 "(A) to enhance the economic and energy
10 security of the United States through the devel-
11 opment of energy technologies that—
12 "(i) reduce imports of energy from
13 foreign sources;
14 "(ii) reduce energy-related emissions,
15 including greenhouse gases;
16 "(iii) improve the energy efficiency of
17 all economic sectors;
18 "(iv) provide transformative solutions
19 to improve the management, clean-up, and
20 disposal of—
21 "(I) low-level radioactive waste;
22 "(II) spent nuclear fuel; and
23 "(III) high-level radioactive
24 waste;

"(v) improve efficiency and reduce the environmental impact of all forms of energy production;

"(vi) improve the resiliency, reliability, and security of the electric grid; and

"(vii) address other challenges within the mission of the Department as determined by the Secretary; and"; and

(2) in paragraph (2) by striking "energy technology projects" and inserting "advanced technology projects".

(c) RESPONSIBILITIES.—Section 5012(e)(3)(A) of such Act (42 U.S.C. 16538(e)(3)(A)) is amended by striking "energy".

(d) STRATEGIC VISION ROADMAP.—Section 5012(h)(2) of such Act (42 U.S.C. 16538(h)(2)) is amended to read as follows:

"(2) STRATEGIC VISION ROADMAP.—In the report required under paragraph (1), the Director shall include a roadmap describing the strategic vision that ARPA-E will use to guide the choices of ARPA-E for future technology investments over the following 2 fiscal years.".

1 (e) COORDINATION AND NONDUPLICATION.—Section
2 5012(i)(1) of such Act (42 U.S.C. 16538(i)(1)) is amend-
3 ed to read as follows:
4 "(1) IN GENERAL.—To the maximum extent
5 practicable, the Director shall ensure that—
6 "(A) the activities of ARPA–E are coordi-
7 nated with, and do not duplicate the efforts of,
8 programs and laboratories within the Depart-
9 ment and other relevant research agencies; and
10 "(B) ARPA–E does not provide funding
11 for a project unless the prospective grantee
12 demonstrates—
13 "(i) sufficient attempts to secure pri-
14 vate financing; or
15 "(ii) that the project is not independ-
16 ently commercially viable.".
17 (f) EVALUATION.—Section 5012(l) of such Act (42
18 U.S.C. 16538(l)) is amended—
19 (1) by striking paragraph (1) and inserting the
20 following:
21 "(1) IN GENERAL.—Not later than 3 years
22 after the date of enactment of the ARPA-E Act of
23 2018, the Secretary may offer to enter into a con-
24 tract with the National Academy of Sciences under
25 which the National Academy shall conduct an eval-

1 uation of how well ARPA-E is achieving the goals
2 and mission of ARPA-E."; and
3 (2) in paragraph (2)—
4 (A) by striking "shall" and inserting
5 "may"; and
6 (B) by striking "the recommendation of
7 the National Academy of Sciences" and insert-
8 ing "a recommendation".
9 (g) PROTECTION OF PROPRIETARY INFORMATION.—
10 Section 5012 of such Act (42 U.S.C. 16538) is amended—
11 (1) by redesignating subsection (n) as sub-
12 section (o); and
13 (2) by inserting after subsection (m) the fol-
14 lowing new subsection:
15 "(n) PROTECTION OF PROPRIETARY INFORMA-
16 TION.—
17 "(1) IN GENERAL.—The following categories of
18 information collected by ARPA-E from recipients of
19 awards under this section shall be considered privi-
20 leged and confidential and not subject to disclosure
21 pursuant to section 552 of title 5, United States
22 Code:
23 "(A) Plans for commercialization of tech-
24 nologies developed under the award, including
25 business plans, technology-to-market plans,

1 market studies, and cost and performance mod-
2 els.
3 "(B) Investments provided to an awardee
4 from third parties (such as venture capital
5 firms, hedge funds, and private equity firms),
6 including amounts and the percentage of owner-
7 ship of the awardee provided in return for the
8 investments.
9 "(C) Additional financial support that the
10 awardee—
11 "(i) plans to invest, or has invested,
12 into the technology developed under the
13 award; or
14 "(ii) is seeking from third parties.
15 "(D) Revenue from the licensing or sale of
16 new products or services resulting from re-
17 search conducted under the award.
18 "(2) EFFECT OF SUBSECTION.—Nothing in this
19 subsection shall be construed to affect—
20 "(A) the authority of the Secretary to use
21 information without publicly disclosing such in-
22 formation; or
23 "(B) the responsibility of the Secretary to
24 transmit information to Congress as required
25 by law.".

1 (h) FUNDING.—Section 5012(o)(4) of such Act (42
2 U.S.C. 16538(o)(4)), as redesignated by subsection (f)(1),
3 is amended by striking "during the 5-year period begin-
4 ning on the date of enactment of this Act".
5 (i) TECHNICAL AMENDMENTS.—
6 (1) Section 5012(g)(3)(A)(iii) of such Act (42
7 U.S.C. 16538(g)(3)(A)(iii)) is amended by striking
8 "subpart" each place it appears and inserting "sub-
9 paragraph".
10 (2) Section 5012(o)(2) of such Act (42 U.S.C.
11 16538(o)(2)), as redesignated by subsection (f)(1),
12 is amended by striking "paragraphs (4) and (5)"
13 and inserting "paragraph (4)".

AMENDMENT TO ARPA-E ACT OF 2018
OFFERED BY MR. LUCAS OF OKLAHOMA

Page 4, strike lines 10 through 16, and insert the following:

1 (B) ARPA–E does not provide funding for
2 a project unless the prospective grantee dem-
3 onstrates sufficient attempts to secure private
4 financing or indicates that the project is not
5 independently commercially viable.

Page 4, line 23 strike "may offer" and insert "is authorized".

Page 5, line 5 strike "may" and insert "is authorized to".

PROCEEDINGS OF THE FULL COMMITTEE MARKUPS: H.R. 6227, NATIONAL QUANTUM INITIATIVE ACT; H.R. 6229, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY REAUTHORIZATION ACT OF 2018; AND H.R. 6226, AMERICAN SPACE SAFE MANAGEMENT ACT

WEDNESDAY, JUNE 27, 2018

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:11 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order. Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee rule 2(e) and House rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes.

Today, we meet to consider H.R. 6227, the *National Quantum Initiative Act*; H.R. 6229, the *National Institute of Standards and Technology Reauthorization Act of 2018*; and H.R. 6226, the *American Space SAFE Management Act*. I'll recognize myself for an opening statement.

The first bill we consider, H.R. 6227, the *National Quantum Initiative Act*, supports a much more concentrated, coordinated Federal effort to accelerate quantum research and technology development for the economic and national security of the United States. Let me thank Ranking Member Eddie Bernice Johnson and the 28 other Members of the Committee for cosponsoring this bipartisan legislation.

The second bill is H.R. 6229, the *National Institute of Standards and Technology Reauthorization Act of 2018*. This legislation, sponsored by Research and Technology Subcommittee Chairwoman Barbara Comstock, authorizes NIST's research and technology programs for 2 years. The bill provides for increased fundamental scientific and technical research and investments in emerging technology areas. This will ensure continued U.S. innovation leadership in quantum science, artificial intelligence and big data science, cybersecurity, the Internet of Things and sustainable infrastruc-

ture. Chairwoman Comstock's bill also directs NIST to use its cybersecurity expertise to assist Federal agencies in improving critical infrastructure cybersecurity.

The final bill is H.R. 6226, the *American Space SAFE Management Act*. This landmark legislation, cosponsored by Space Subcommittee Chairman Brian Babin, Ranking Member Ami Bera, and Congressman Ed Perlmutter, establishes a space traffic management framework that will ensure a safe operating environment in outer space.

PREPARED STATEMENT OF CHAIRMAN SMITH

Today we meet to consider three bills. The first is H.R. 6227, the *National Quantum Initiative Act*. This legislation supports a much more concentrated, coordinated Federal effort to accelerate quantum research and technology development for the economic and national security of the United States.

Let me thank Ranking Member Eddie Bernice Johnson and the 28 other members of the committee for co-sponsoring this bipartisan legislation. The second bill is H.R. 6229, the *National Institute of Standards and Technology (NIST) Reauthorization Act of 2018*. This legislation, sponsored by Research and Technology Subcommittee Chairwoman Barbara Comstock, authorizes NIST's research and technology programs for two years.

The bill provides for increased fundamental scientific and technical research and investments in emerging technology areas. This will ensure continued U.S. innovation leadership in quantum science, artificial intelligence and big data science, cybersecurity, the internet of things and sustainable infrastructure.

Chairwoman Comstock's bill also directs NIST to use its cybersecurity expertise to assist federal agencies in improving critical infrastructure cybersecurity. The final bill is H.R. 6226, the *American Space SAFE Management Act*. This landmark legislation, co-sponsored by Space Subcommittee Chairman Brian Babin, Ranking Member Ami Bera and Congressman Ed Perlmutter, establishes a space traffic management framework that will ensure a safe operating environment in outer space.

Chairman SMITH. I'll recognize the Ranking Member, the gentlewoman from Texas, Eddie Bernice Johnson, for her opening statement.

Ms. JOHNSON. Thank you very much, Chairman Smith, for holding today's markup of three bills. The first bill we are considering is the *National Quantum Initiative Act*. This is a good bill, and I'm happy to urge my colleagues to join me in cosponsoring the legislation. I'll speak more on this bill in a little while. So let me just say that I'm very happy the Science Committee is taking the lead here in this cutting-edge field.

I also want to thank the Chair for working closely with us to draft a bipartisan bill that I think will also be widely supported by industry and academia. This bill really is a good example of what the Science Committee does best, and I look forward to its passage.

The second bill we are considering, the *National Institute of Standards and Technology Reauthorization Act of 2018* is another good bill which I'm cosponsoring. This bill reauthorizes one of our most important but underappreciated agencies in the Federal Government. NIST is a vital partner for American industry in fields as diverse as infrastructure construction to cybersecurity. They're also an essential collaborator with American manufacturing.

I want to thank the Chairman for working with us to address some concerns we had with the original draft of the bill, and I support the manager's amendment that is intended to address several of those concerns. I look forward to advancing this bill through the House and working with the Senate to get it enacted.

Finally, we're marking up the *American Space SAFE Management Act*. Unfortunately, I must reluctantly oppose this bill today. I want to be clear. I strongly support efforts to establish a civilian space situational awareness capacity. However, I do not support our Committee rubberstamping the half-baked efforts of the Trump Administration to address the issue.

Currently, the Department of Defense handles space situational awareness for the U.S. Government. There's been a growing recognition that the civilian side of this work would be more appropriate outside DOD. The Obama Administration began to plan for this and work was underway to place this function at the Department of Transportation, which currently is the body that promotes and regulates commercial space launch and reentry.

Then, the Trump Administration came in and decided it wanted to move this function to the Department of Commerce instead. This is in spite of the fact that Commerce has no existing infrastructure or expertise to support this important work. In fact, no credible reason has been articulated for why the Commerce Department is the best place to house the function. The only discernible motivation for reversing course is that they didn't want to endorse something Obama had started. This is no way to govern, and it wouldn't be the first time this Administration has acted that way.

I'll have an amendment later to do this oversight Congress should have demanded. I've been in hearings in other Committees on this very same subject. Let's have the Academies look at the issue and give us guidance on what civilian agency is best suited to shoulder this new responsibility. Maybe they decide Commerce is the right one, or maybe they will decide that our $21 billion civilian space agency would be best. Then, we can come back and make an informed decision instead of just rubberstamping the ill-formed ideas coming from the Trump Administration.

Thank you, and I yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith, for holding today's markup of three bills.

The first bill we are considering is the *National Quantum Initiative Act*. This is a good bill, and I am happy to urge my colleagues to join me in cosponsoring the legislation. I will speak more on this bill in a minute, so let me just say that I am very happy the Science Committee is taking the lead here in a cutting-edge field. I also want to thank the Chairman for working closely with us to craft a bipartisan bill that I think will also be widely supported by industry and academia. This bill really is a good example of what the Science Committee does best, and I look forward to its passage.

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I'll have an amendment later to do the oversight Congress should have demanded when the Trump Administration first started pushing this agenda. Let's have the Academies look at the issue and give us guidance on what civilian agency is best suited to shoulder this new responsibility. Maybe they decide Commerce is. Or maybe they will decide that our 21 billion dollar civilian space agency would be best. Then we can come back and make an informed decision, instead of just rubber stamping the ill-formed ideas coming from the Trump Administration. I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

H.R. 6227

Chairman SMITH. Pursuant to notice, I now call up H.R. 6227, the *National Quantum Initiative Act*. And the clerk will report the bill.

The CLERK. H.R. 6227, a bill to provide for coordinated Federal program to accelerate quantum research and development for the economic and national security of the United States.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point, and I'll recognize myself to speak on the bill.

Sixty years ago, the first commercial computer was almost the size of this room. Today, we hold more computing power in our hand with an iPhone. Just as classical computing redefined the 20th century, quantum has posed—seems poised to redefine the next generation of scientific breakthroughs.

Conventional computing uses a series of tiny, electronic on-off switches within a processing chip. Technological advances have made possible supercomputers that can perform series of on-off operations at astonishing speeds. But classical computing technology is nearing its limits. Quantum computing is different. Quantum computers rely on q-bits. These are subatomic particles that are both on and off at the same time. This will enable quantum computers to perform complex calculations at speeds that are potentially millions of times faster than today's most advanced supercomputers.

Quantum will create exciting new opportunities in areas like cybersecurity, medicine, communications, financial services and transportation. But the potential threat to America's security is sobering. The nation that develops quantum communications technology first may be able to decode, in a matter of seconds, other countries' sensitive national security information, proprietary technologies, and personal information.

Last October, the Science Committee held a hearing on American leadership in quantum technology. Experts testified that, as other nations around the word are rapidly advancing quantum programs, the United States faces the threat of falling behind. China and the

European Union are investing billions of dollars in new research facilities and equipment for quantum computing. China, in particular, has Stated publicly its national goal of surpassing the United States during the next decade. Now is the time to compose a national quantum strategy and preserve America's dominance in the scientific world.

The *National Quantum Initiative Act* will meet these challenges by forming a 10-year program to advance quantum science development and technology applications in the United States. The bill leverages the expertise and resources of U.S. industry, academia, and government to move quantum information science to the next level of research and development.

The legislation establishes a National Quantum Coordination Office within the White House Office of Science and Technology Policy. The office will oversee interagency coordination and strategic planning, serve as a central point of contact for stakeholders, conduct outreach, and promote commercialization of Federal research by the private sector.

The bill also supports basic research, education, and standards development at the National Institute of Standards and Technology, the National Science Foundation, and the Department of Energy. Two hundred and twenty-five million dollars a year of these agencies' baseline funding will now be directed to new quantum research centers and laboratory research. Their activities will address fundamental research gaps, create a stronger work force, and develop revolutionary knowledge and transformative innovations to give U.S. companies and workers an enduring competitive advantage.

The bill ensures that U.S. high-tech companies, which are investing heavily in quantum research, and a surge of quantum technology startups will contribute their knowledge and resources to a national effort.

H.R. 6227 was developed with input from industry, academia, national laboratories, Federal agencies, and the Administration. It was an open and bipartisan process. The input of those stakeholders has yielded a good consensus bill. We have received broad support, including letters from the National Photonics Initiative, the Quantum Industry Coalition—which I think consists of about 15 members—IBM, Intel, Google, Harris Corporation, Yale, Harvard, the University of Maryland, and the Optical Society, among many others.

I thank Ranking Member Johnson for joining me in introducing this bill and the many Members of the Committee who have signed on as original cosponsors.

I would also like to acknowledge that Senator Thune and Senator Nelson, the Chairman and Ranking Member of the Senate Commerce Committee, have introduced a companion bill in the Senate. With bipartisan, bicameral support and the backing of the Administration, I believe this bill could become law by the end of the year.

Winning this scientific race requires a new moonshot for the 21st century. This bill will align ongoing Federal, academic, and private sector research for a quantum leap in the right direction.

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Winning this scientific race requires a new moonshot for the 21st Century. This bill will align ongoing federal, academic and private sector research for a quantum leap in the right direction.

Chairman SMITH. That concludes my statement, and now, the Ranking Member Ms. Johnson is recognized for hers.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

I appreciate the fact that you've introduced H.R. 6227, the *National Quantum Initiative Act*, on which I'm happy to be a cosponsor.

This legislation will establish a national program to accelerate progress in research and technology development related to quantum information science. Research in this area promises to revolutionize the way we solve problems by leveraging quantum effects such as superposition and entanglement.

Many believe quantum computing technology has the potential to accelerate progress on some of our most pressing challenges, including how to address climate change and understand complex diseases like cancer. The race is on to build the world's first quantum computer capable of solving problems that have long eluded conventional computers. Not unlike the space race in the 1960's, the stakes in today's quantum race are high.

Global leadership in quantum computing brings with it a military and intelligence edge, as well as a competitive advantage in what many expect to be a massive industry for decades to come. The National Quantum Initiative authorized in this bill enables coordinated activities at the Department of Education, the National Science Foundation, and the National Institute of Standards and Technology, as well as many other important Federal agencies that will have a role in developing and benefiting from these technologies.

Along with sustaining support for research in this area in general, DOE and NSF will fund new national centers to bring together preeminent experts in quantum science, hardware and software development, and education at NIST will lead the way in developing the measurement and standards infrastructure vital to the emerging industry.

By promoting access to the products of these activities across the Federal Government and to academia and the private sector, the National Quantum Initiative enables—ensures that we will maximize the return on this investment. We must invest more in this research. We need to ensure that we are educating and training the next generation of top quantum scientists and engineers, and we should do more to encourage partnerships between government, academia, and industry.

This is good legislation, and this will let us—or put us on the right track, and I urge my colleagues to join me in supporting its passage.

Chairman SMITH. And you yield back? The gentlewoman yields back, and her statement is appreciated.

We will now go to amendments on this particular bill, and the first one is going to be offered by the gentleman from Illinois, Mr. Hultgren, and he is recognized for that purpose.

Mr. HULTGREN. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. And the—I'm sorry. The clerk will report the amendment.

The CLERK. Amendment to H.R. 6227, offered by Mr. Hultgren of Illinois, amendment number 002.

Chairman SMITH. OK. Without objection, the amendment will be considered as read, and the gentleman is recognized.

Mr. HULTGREN. Thank you, Mr. Chairman.

My amendment adds a provision to the duties of the National Quantum Coordination Office tasking it with and ensuring that the Federal research agencies, through their quantum research programs and the new NSF and DOE centers, are utilizing existing quantum computers and communication systems for federally funded research.

Several U.S. companies, universities, and laboratories have developed or are developing functioning quantum systems. It's important that the government not duplicate those efforts already underway but tap those resources to further basic research and application development.

DOE, NSF, and NIST have all supported research grants in the past, utilizing private supercomputer and cloud computing systems, and this will ensure that they continue to do the same thing for quantum systems.

Again, I want to thank Chairman Smith and Ranking Member Johnson for working with me and the external stakeholders on this amendment, and I yield back.

Chairman SMITH. Thank you, Mr. Hultgren.

I support the amendment and recommend our colleagues support it as well.

Is there any further discussion?

Mr. LIPINSKI. Move to strike the last word?

Chairman SMITH. Who seeks recognize? Oh, I'm sorry. Mr. Lipinski is recognized.

Mr. LIPINSKI. Thank you, Mr. Chairman.

I support the amendment, and I thank the Chairman for working in a bipartisan way on this bill. I think it's very important that what we—we do what we aim to accomplish in this bill: Invest significant Federal resources in a promising technology whose benefits may be a long way off but where there's fierce international competition.

It's going to be through strategic decisions like these that we will become the world's economic, scientific, and technical leader in this as we start out now, and we can only maintain that position through continuous significant investment in cutting-edge basic research. We know other countries are increasing their investments in quantum technology, in some cases guided by long-term strategies, and this bill will make sure that we develop a coherent strategy of our own.

Mr. Hultgren and I were—both come from the Chicago area, and I think it's important to highlight and commend the research partnership from Chicago that's been instrumental in contributing to the Committee's understanding of quantum information science, including testifying at hearings, participating in roundtables, and reviewing drafts of this legislation.

Chicago Quantum Exchange, the partnership between University of Chicago, Argonne National Lab, and Fermi National Accelerator Lab, Chairman Weber had a codel out to the—these labs a few weeks ago, and a number of Members of the Committee got to hear more about what they're doing when it comes to quantum.

The Exchange was created to develop and grow interdisciplinary collaborations for the exploration and development of new quantum-enabled technologies and to help educate a new generation of quantum information scientists and engineers.

Partnership with the private sector is also an important element of the Exchange. Chicago Quantum Exchange may be a model for the future of R&D in quantum information science, and this bill will help that and help our country when it comes to moving ahead with quantum.

With that, I yield—my colleagues to support the amendment and the bill, and I yield back.

Chairman SMITH. OK. Thank you, Mr. Lipinski.

Is there any further discussion?

If not, the question is on the Hultgren amendment.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

The next amendment is going to be offered by the gentleman from California, Mr. Rohrabacher, and he's recognized for that purpose.

Mr. ROHRABACHER. I have an amendment at the desk, Mr. Chairman.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to H.R. 6227, offered by Mr. Rohrabacher of California, amendment number 057.

Chairman SMITH. Without objection, the amendment will be considered as read, and the gentleman is recognized to explain his amendment.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman.

Ronald Reagan, who I once worked for, once said, "No government ever voluntarily reduces itself in size. So government's programs, once launched, never disappear. Actually, they're the nearest thing to eternal life we'll ever see on this earth," end of quote. My amendment would end the National Nanotechnology Initiative by transitioning the duties and activities to the appropriate Federal agencies and offices as we stand up the National Quantum Initiative.

Since the passage of the *21st Century Nanotechnology Research and Development Act of 2003*, which I supported, the Nanotechnology Initiative, which I—which is the NTI—has helped make the United States a global leader in nanotechnology. From Fiscal Year 2001 through Fiscal Year 2015, the Federal Government has spent approximately $20 billion, close to $21 billion actually, in this—in nanoscale research, engineering technology through the NNI.

After years of nanotechnology research, Federal agencies have well-established this research, nanotechnology research, and regulatory activities. Nanotechnology is not some new morphous thing that we are trying to get a handle on and build a strategy around. We have been successful at that. And while I am certain some level

of cross-collaboration will continue to be useful in this area, there is no longer any necessity for this overreaching program. The NNI is 15 years old this year. The Manhattan Project lasted 5 years. The Human Genome Project—and I—again, which I supported, lasted 13 years.

There is clearly more research to be done in nanotechnology, and this proposal doesn't stop Federal agencies from pursuing nanotechnology in their specific areas, but this type of overarching coordination and spending has reached its logical endpoint. The NNI has been a great catalyst to bring our Nation to the next level, but continuing it requires the use of limited resources, which threatens new initiatives like the National Quantum Initiative, which is critical for America's future. We should not continue to subsidize our focus. It is important to sunset these things, and they should not just go on in perpetuity.

I would not the Quantum Initiative and the base bill sunsets, what we are about to pass, sunsets after 10 years. And I know some will oppose what I'm suggesting here as a reflexive refusal to end any government program, to close any government office, no matter how clearly it has outlived its usefulness. But I would note that the NNI was never intended to be a never-ending entitlement. That—and again, I voted for that initiative when we started it, but it wasn't meant to be a never-ending program. The program has succeeded in helping push the United States to the next frontier of nanotechnology. It did its job, and now it's time to move on to the next phase, which is the Quantum Initiative.

And the Quantum Initiative is a proper way for Congress to coordinate and support pioneering scientific research over the next decade by establishing a 10-year framework, which is what our bill does, for moving quantum past this point and into the next stage of development, just—which is to maintain scientific leadership in the—for the United States.

All things being said, I have no interest in derailing this agreement that our Chairman and others have worked so hard to put in place. So I expect to withdraw this amendment once everyone has had an opportunity to discuss it, and I thought I would add these thoughts so people can basically understand the dynamics of why we have a $20 trillion bill that we're passing on to future generations. We need to be able to end programs as well as begin them. We cannot create endless programs and initiatives that—with no end dates included.

John Kennedy set the goal of landing a man on the moon before the decade was out. Deadlines focus minds and efforts. End points for our programs can be just as important as starting points. And so I will be withdrawing my amendment if there's no other discussion. But I thank the leadership for the initiative that you're showing today. And let us be responsible when we create new initiatives that are important for our country.

I yield back.

Chairman SMITH. Mr. Rohrabacher, thank you for your good points. As you suggested, we'll see if there's any further discussion, but I appreciate your willingness to withdraw the amendment and let us advance the legislation.

But is there any further discussion on this particular amendment?

If not, without objection, the amendment will be——

Mr. ROHRABACHER. I withdraw my amendment.

Chairman SMITH. Without objection, so ordered. Thank you, Mr. Rohrabacher.

The last amendment is by the gentleman from Illinois, Mr. Foster, and he is recognized to offer the amendment.

Mr. FOSTER. Thank you, Mr.—Chairman Smith. I'd like to also thank my colleague, Congresswoman Esty, for——

Chairman SMITH. OK. And the clerk will report the amendment first.

Mr. FOSTER. Oh.

The CLERK. Amendment to H.R. 6227, offered by Mr. Foster of Illinois, amendment number 110.

Chairman SMITH. And, without objection, the amendment is considered as read. And the gentleman is recognized to explain his amendment.

Mr. FOSTER. Thank you, Chairman Smith.

I'd like to thank my colleague, Congresswoman Esty, for cosponsoring this amendment, which I intend to withdraw at the conclusion of the debate.

This was a very—a few months ago we held a joint Subcommittee hearing on American leadership in quantum technology, and this was a very productive and bipartisan discussion, and I'm glad that the Committee followed up with outreach to many stakeholders on this important issue.

I join my Republican and Democratic colleagues in supporting the National Quantum Initiative. I appreciate that this bill instructs the coordination of quantum research and development across agencies and with industry and academic partners. I believe this is key to ensuring the success of this effort.

I would like to emphasize that this is a technically risky endeavor, and neither technological success nor practical—nor great practical relevance is assured. But I'm proud that Congress is operating on the advice of top scientists is willing to take that risk.

There's a famous quote that's attributed to two great scientists—Michael Faraday and Benjamin Franklin—when asked about new technologies such as electricity and what the practical relevance is, and their response was "Of what use is a newborn baby?" And this I think really is a fair description of quantum technology at this point.

However, given the bipartisan support for this initiative, I was disappointed to see that this bill explicitly does not fund the participating agencies to start several new activities. And my amendment today corrects this problem by striking language in the bill that States that no additional funds are authorized to carry out the National Quantum Initiative.

The decision to legislative new activities without new funding would inevitably mean that other valuable research in these agencies would suffer. I'm also concerned that the Director of National Quantum Coordination Office is appointed by the Director of the Office of Science and Technology Policy, a position that President Trump has not filled almost 2 years into his term of office.

Now, I understand that the Chair is opposed to this amendment, so as a courtesy to him, I will withdraw it, but I do hope to work with my Republican colleagues to increase funding for the participating agencies so that the National Quantum Initiative can be properly funded without damage to other activities.

And with that, I'd like to yield 1 minute to my colleague, Ms. Esty.

Ms. ESTY. Thank you. And I, too—and I know from our hearings that quantum has enormous potential for this country, and other countries are leaning in hard, allocating lots of resources. And I think it would be pennywise and pound foolish for us to try to support in name this initiative and not actually secure vital funding. We know China is investing massive resources in basic R&D, and again, for us to remain on the cutting edge, we need to actually back that up with some resources.

So I join my colleague Mr. Foster and thank him for raising this amendment, and I think it's important, and I hope moving forward we can look to find a way to ensure that this critically important initiative receives the funding—not just the titles but the funding it's going to need to, again, keep the United States on that cutting edge of research and allow us to be competitive in the world.

Thank you, and I yield back.

Mr. FOSTER. Thank you. And I——

Chairman SMITH. OK.

Mr. FOSTER [continuing]. Withdraw the amendment.

Chairman SMITH. OK. Thank you, Mr. Foster. And thank you, Ms. Esty, as well.

Let me say that I know you all are aware of the constraints we sometimes operate under, and under House rules, we can't increase the funding right now. But let me reassure both of you that I do support an increase in funding and will look for ways to try to achieve that.

And, Mr. Foster, I appreciate the courtesy, and without objection, the amendment is withdrawn.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 6227 to the House, as amended, with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 6227 to the House, as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it. The bill is ordered reported favorably.

And without objection, the motion to reconsider is laid upon the table. H.R. 6227 is ordered reported to the House. I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. And without objection, so ordered.

H.R. 6229

Chairman SMITH. Pursuant to notice, we now go to H.R. 6229, the *National Institute of Standards and Technology Reauthorization Act of 2018*. And the clerk will report the bill.

The CLERK. H.R. 22—6229, a bill to authorize the programs of the National Institute of Standards and Technology and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point.

And I understand we will now go to the gentleman from Oklahoma, Mr. Lucas, for a statement.

Mr. LUCAS. Thank you, Mr. Chairman, for the opportunity to speak on behalf of Subcommittee Chairman Comstock's bill, H.R. 6229, the *National Institute of Standards and Technology Reauthorization Act of 2018*.

NIST works to promote innovation and industry competitiveness by advancing measurement science, standards, and technology. This legislation authorizes NIST's Industrial Technology Services account, construction accounts, and bolsters the Science and Technical Research and Services lab account for fiscal years of 2018 and 2019.

NIST has the mission and capabilities to contribute to areas critical to the United States' global competitiveness. To this end, for Fiscal Year 2019, this legislation authorizes increased investments in four emerging technology areas: Quantum science, artificial science, data science, advanced communications, and the Internet of Things and composites research and standards development.

As we've just heard during our consideration of the *National Quantum Initiative Act of 2018*, an international race to claim quantum supremacy has begun. And it is not just in quantum that we are racing our international rivals to develop. By facilitating NIST's development of tools to address performance and reliability concerns of artificial intelligence, NIST will develop—will accelerate I should say the implementation of AI systems and give U.S. industries a competitive edge. The discoveries and technological advances that will stem from these investments will significantly affect the Nation's economy in decades to come.

One of the great challenges of the 21st century is cybersecurity, and this legislation helps NIST address growing cyber threat landscape by providing for the increase of its fundamental and applied cyber research to address key questions relating to the measurement of privacy, security, and the vulnerability of software tools and communication networks.

This Committee has held multiple hearings on cybersecurity since the news that the Office of Personnel Management, OPM, was the target of two massive data breaches, exposing the sensitive information of over 21 million Americans, and yes, many of our constituents.

Last month, the office of OMB published the Federal Cybersecurity Risk Determination Report and Action Plan in accordance with Trump Executive Order 13800. The report identifies that 74 percent of Federal agencies participating in the risk assessment process have cybersecurity programs that are either at risk or high risk. The report also confirms the need to take bold approaches to improve Federal cybersecurity.

NIST plays a very important role in protecting from cyber threats through its ongoing cybersecurity research, including the applications of blockchain technology and by providing guidelines

and standards to help reduce cyber risk in Federal agencies and critical infrastructure. This legislation requires NIST to enhance and expand its guidance and assist Federal agencies to help them to effectively use the NIST-authored Framework for Improving Critical Infrastructure Cybersecurity. The President's executive order directed each agency to use the framework. It is my hope that this language will prompt agencies to rely on NIST's expertise in order to adopt these best risk management practices within their agencies.

This Committee has a long, bipartisan record of support for NIST and its contribution to research and development. It is my hope that all of my colleagues on the Committee will continue that tradition and support this bill.

Thank you again, Mr. Chairman, for bringing this important piece of legislation up for consideration. Thank you, Ranking Member Johnson, Ranking Member Lipinski, and other Members of the Committee for your work with the Chairwoman and supporting this bill.

I yield back the balance of my time, Mr. Chairman.

PREPARED STATEMENT OF MR. LUCAS

Thank you Mr. Chairman for the opportunity to speak on behalf of my bill, H.R. 6229, the *National Institute of Standards and Technology (NIST) Reauthorization Act of 2018*.

NIST works to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards and technology. This legislation authorizes NIST's Industrial Technology Services account, construction accounts, and bolsters the Scientific and Technical Research and Services lab account for fiscal years 2018 and 2019.

NIST has the mission and capabilities to contribute to areas critical to the United States' global competitiveness. To this end, for fiscal year 2019, this legislation authorizes increased investments in four emerging technology areas: Quantum science, artificial intelligence and data science, advanced communications and the internet of things and composites research and standards development.

As we've just heard during our consideration of the *National Quantum Initiative Act of 2018*, an international race to claim quantum supremacy has begun. And it is not just in quantum that we are racing our international rivals to develop. By facilitating NIST's development of tools to address performance and reliability concerns of artificial intelligence (AI), NIST will accelerate the implementation of AI systems and give U.S. industries a competitive edge.

The discoveries and technological advances that will stem from these investments will significantly affect the nation's economy in the coming decades.

One of the great challenges of the 21st Century is cybersecurity. This legislation helps NIST address the growing cybersecurity threat landscape by providing for the increase of its fundamental and applied cybersecurity research to address key questions relating to the measurement of privacy, security and the vulnerability of software tools and communication networks.

This committee has held multiple hearings on cybersecurity since the news that the Office of Personnel Management (OPM) was the target of two massive data breaches-exposing the sensitive information of over 21 million Americans, including me and many of my constituents.

Last month the Office of Management and Budget (OMB) published its "Federal Cybersecurity Risk Determination Report and Action Plan" in accordance with Trump Executive Order 13800. The report identifies that 74 percent of federal agencies participating in the risk assessment process have cybersecurity programs that are either at risk or high risk. The report also confirms the need to take bold approaches to improve federal cybersecurity.

NIST plays a very important role in protecting from cyber threats through its ongoing cybersecurity research, including the applications of blockchain technology, and by providing guidelines and standards to help reduce cyber risks in federal agencies and critical infrastructure. This legislation requires NIST to enhance and expand its guidance and assistance to Federal Agencies to help them to effectively

use the NIST-authored "Framework for Improving Critical Infrastructure Cybersecurity."

The President's Executive Order directed each agency to use the framework. It is my hope that this language will prompt agencies to rely on NIST's expertise in order to adopt these best risk management practices within their agencies.

This committee has a long, bipartisan record of support for NIST and its contributions to research and development. It is my hope that all of my colleagues on the committee will continue that tradition and support this bill. Thank you again Mr. Chairman for bringing this important piece of legislation up for consideration, and thank you to Ranking Member Johnson, Ranking Member Lipinski and the many other members of this committee for working with me and supporting this bill. I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Lucas.

I also want to mention that the sponsor of the bill, Barbara Comstock, is at a funeral and appreciate the gentleman from Oklahoma stepping in for her.

Mr. LIPINSKI. Mr. Chairman?

Chairman SMITH. The gentleman from Illinois, Mr.——

Mr. LIPINSKI. Move to strike the last word.

Chairman SMITH [continuing]. Lipinski. The gentleman from Illinois is recognized.

Mr. LIPINSKI. Thank you. I appreciate the majority moving this bill and happy to cosponsor it with the assurances of the manager's amendment, which I believe will momentarily be passing. We really need—this really helps to put NIST in a good position to carry out its work through the end of Fiscal Year 2019. And, as we all know, NIST expertise across many fields is critical to our economy, our research enterprise, and our manufacturing sector.

And I want to particularly highlight the strong support for the Hollings Manufacturing Extension Partnership and the Manufacturing USA programs, which received robust authorization under the Industrial Technology Services account. And I thank the majority for their willingness to increase the Fiscal Year 2019 authorization level to match the agency request.

I have a strong relationship with the Manufacturing USA Institute for Digital Manufacturing located just outside my district in Chicago. Through partnerships with universities, manufacturers, nonprofits, and government entities, they work to develop the technology-enabled manufacturing tools industry needs, pilot them on the factory floor, and train the manufacturing work force.

Beyond manufacturing, I also want to highlight the critical position pay authority this bill gives NIST to hire talented cybersecurity and quantum information science professionals. It is often difficult for Federal agencies to attract top-level talent in these fields because the Federal pay scale cannot compete with the private sector. This bill grants a limited exemption to the Federal pay scale to ensure that NIST will have access to the right people to lead the Nation in cybersecurity and quantum information science. This is an issue that has been raised before this Committee in hearings, and so I'm very happy that we do this in the bill. It will certainly be very helpful to hire the people that we need. So I want to urge my colleagues to support the bill and yield back.

Chairman SMITH. Thank you, Mr. Lipinski.

We will now proceed with amendments, and the first one up is the manager's amendment that will be offered by the gentleman from Oklahoma, Mr. Lucas. And he's recognized for that purpose.

Mr. LUCAS. Mr. Chairman, I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 6229, offered by Mr. Lucas of Oklahoma on behalf of Mrs. Comstock of Virginia, amendment number 01.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman from Oklahoma is recognized to explain the amendment.

Mr. LUCAS. Thank you, Mr. Chairman. I offer today a manager's amendment on behalf of Chair Comstock that makes a few changes in the bill, responding to feedback from Members of the Committee. The amendment authorizes the current level for NIST's Industrial Technology Services account in the fiscal years of 2018 and 2019. It also clarifies NIST's role in assisting Federal agencies and their staffs with using NIST's framework for improving critical infrastructure cybersecurity.

I want to thank the Chairman, the Ranking Member, and Ranking Member Lipinski for working with the Chairwoman on this manager's amendment, and I urge my colleagues to support the amendment and reserve the balance of my time.

Chairman SMITH. Thank you, Mr. Lucas.

Is there any further discussion on the amendment?

The gentleman from New York, Mr. Tonko, is recognized.

Mr. TONKO. Mr. Chairman, I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. TONKO. Thank you, Mr. Chairman.

I move to strike the last word because I'm relieved that we were able to work in a bipartisan manner to restore level funding for the Fiscal Year 2019 funding for the Industrial Technology Service's activities, which include important manufacturing programs such as NNMI and MEP.

Manufacturing is critical to the American economy, to jobs, and our national security. Our manufacturing sector employs nearly 1 in 10 of our workers, makes up some 12 percent of our GDP.

Reports have confirmed that, on average, each manufacturing job creates additional three to four jobs due to the required research, development, and process design and needed supply chain and post-sales services, as well as boosting the service sector as a result of high-paying manufacturing jobs with an average annual compensation of about $80,000.

Personally, I strongly believe that the government should be a partner in working to revitalize and strengthen the U.S. manufacturing sector and that NIST plays a vital role in this endeavor. As a Representative for the capital region of New York, I realize that moving toward an innovation economy is the key to economic growth. With that in mind, I am pleased to witness our Nation's renewed desire to invest in a high-tech manufacturing effort and in an innovation economy.

I was proud when we came together as a Nation and made a commitment to invest in manufacturing when we created the first-ever national network of manufacturing hubs or National Network

of Manufacturing Initiative, NNMI, through the overwhelming bipartisan package of the *Revitalize American Manufacturing and Innovation, or RAMI, Act*. I see great hope for these efforts if we have continued support and sustained long-term funding, as we see in other countries.

NNMIs help accelerate Innovation by investing in industrially relevant manufacturing technologies with broad applications and by supporting manufacturing technology commercialization, by bridging the gap between the laboratory and the market.

They also support the work of MEPs. The MEP program is a nationwide network of proven resources that enables manufacturers to complete—or to compete rather globally, supports greater supply chain integration, and provides access to information, training, and technologies that improve efficiency, productivity, and profitability.

The MEP program's well-documented impact is substantial. In Fiscal Year 2016 alone MEP projects with small and medium-size manufacturers created or retained some 68,477 jobs, generated more than $8 billion in new and retained sales, and provide cost savings of more than $1.2 billion.

I thank this Committee for continued support of NNMIs and MEPs, which are both vital to revitalizing and supporting American manufacturing. While I support visionary investments that include increases and sustained long-term funding, I am relieved that at least this funding has been restored to Fiscal Year 2019.

And with that, Mr. Chair, I yield back.

Chairman SMITH. All right. Thank you, Mr. Tonko, for those comments.

If there's no further discussion, the question is on the Lucas amendment.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

Mr. Tonko, after that last great statement, do you still want to offer an amendment?

Mr. TONKO. Well, I have an amendment at the desk, Mr. Chair, but because of the manager's amendment, I don't know if there's anyone that wants to speak to my amendment, but if not, I would withdraw.

Chairman SMITH. OK. I appreciate that. Without objection, the amendment is withdrawn.

Mr. TONKO. Thank you.

Chairman SMITH. OK.

Mr. ROHRABACHER. Mr. Chairman?

Chairman SMITH. The gentleman from California, Mr. Rohrabacher, seeks recognition. What——

Mr. ROHRABACHER. As we move forward with this reauthorization, let us note that in the Constitution of the United States at article 1, section 8 of the Constitution establishes what authorities we have in our—what we are dealing from, the legal authority we started and where we're at. And in article 1, section 8, it says that the Federal Government shall have the power to fix standards and weights and measures. And I think that what we're doing today, I think—when we're—when we have such a massive debt that we're having to deal with, we need to go back and understand that

when we are doing things that are fundamental and are important and fixing the standards and weights and measures for our country is exactly what NIST is all about and exactly what science is all about.

And this I believe I would just like to remind our colleagues that we're doing something that our Founding Fathers could envision us doing, but it's up to us to do so in a responsible manner.

Thank you very much.

Chairman SMITH. Good reminder, Mr. Rohrabacher. Thank you for that.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 6229 to the House, as amended, with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 6229 to the House.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 6229 is ordered reported to the House. I ask unanimous consent that the staff be authorized to make any necessary technical and conforming changes. And without objection, so ordered.

H.R. 6226

Chairman SMITH. Great. We now go to consideration of H.R. 6226, and pursuant to notice, I call up H.R. 6226, the *American Space SAFE Management Act*. And the clerk will report the bill.

The CLERK. H.R. 6226, a bill to direct the Secretary of Commerce to provide for civil space situational awareness services and information and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point. And I'll recognize myself to speak in favor of the legislation.

The world is on the cusp of an amazing revolution in space. Today, there are 1,100 active satellites in orbit. In a few years, there will be tens of thousands. And a variety of new and dynamic spacecraft will go into operation, such as private space stations, on-orbit repair and refueling satellites, and celestial resource prospectors. With this great increase in activity, it is time for our Nation to lead the world by establishing a space traffic management framework that will ensure a safe operating environment in outer space.

The *American Space SAFE Management Act* addresses this timely and important challenge facing spacefaring nations. It does so by addressing science and technology, space situational awareness, and space traffic management. First, this act directs the Administration to coordinate its Federal research and development investments in space traffic management. It also directs the Administration to work collaboratively with the private sector. Finally, it establishes a NASA Center of Excellence that will develop, lead, and promote research in space traffic management.

Second, this act creates a space situational awareness, or SSA, program within the Department of Commerce. Commerce will provide a basic level of SSA information and services, free of charge,

to the public. While the Department of Defense retains the tracking sources currently used to compile the catalog of space objects, Commerce will augment that with data from other sources, including the private sector and foreign partners.

Many stakeholders want access not only to SSA services but also to the underlying data, so this act establishes a space situational awareness testbed that complements the broader SSA program. This testbed will allow the public to access certain SSA data subject to relevant national security and foreign policy concerns.

Third, a space traffic management framework will be established. This framework will be built on top-down voluntary guidelines developed by the government, bottom-up standards developed by industry, and a pilot space traffic coordination program. The pilot program will allow the government and stakeholders to experiment and learn more about the best ways to manage space traffic. This framework is a commonsense first step in what will be a long-term process of developing a comprehensive space traffic management framework.

The *American Space SAFE Management Act* is the culmination of years of work that this Committee has undertaken. Over 4 years ago, this Committee held its first of several hearings on space traffic management followed by many hearings, roundtable events, and meetings with stakeholders. The *Space SAFE Management Act* has the full support of the President; Vice President; the National Space Council; and Secretaries of Defense, Transportation, and Commerce.

Original co-sponsors include Space Subcommittee Chairman Brian Babin, Representative Bera, Representative Lucas, Representative Perlmutter, and Representative Rohrabacher. Thanks go to the Committee Members and staff for developing this history-making, commonsense, bipartisan bill.

PREPARED STATEMENT OF CHAIRMAN SMITH

The world is on the cusp of an amazing revolution in space. Today, there are eleven hundred active satellites in orbit. In a few years, there will be tens of thousands. And, a variety of new and dynamic spacecraft will go into operation, such as private space stations, on-orbit repair and refueling satellites and celestial resource prospectors.

With this great increase in activity, it is time for our nation to lead the world by establishing a space traffic management framework that will ensure a safe operating environment in outer space.

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The *Space SAFE Management Act* has the full support of the president, vice-president, the National Space Council, and the Secretaries of Defense, Transportation and Commerce.

Original co-sponsors include Space Subcommittee Chairman Brian Babin, Rep. Bera, Rep. Lucas, Rep. Perlmutter and Rep. Rohrabacher. Thanks go to the committee members and staff for developing this history-making, common sense, bipartisan bill.

Chairman SMITH. At this time, I ask unanimous consent to enter in the record letters of support for the *American Space SAFE Management Act* from the following organizations: Commercial Spaceflight Federation, a trade association with over 80 members, companies, and organizations; Bigelow Aerospace; Maxar; and SpaceX.

SPACEX

June 25, 2018

The Honorable Lamar Smith
Chairman
Committee on Science, Space, and Technology
U.S. House of Representatives
2321 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Smith:

Thank you for your leadership on the *American Space SAFE Management Act*. This bill is an important step to ensuring continued safe and affordable access to space consistent with U.S. civil, commercial, and national security objectives.

SpaceX is committed to responsible stewardship of the space environment. As the number of operators in space continues to grow, the U.S. should develop an appropriate civil agency interface to share space situational awareness (SSA) information with the commercial sector to ensure a safe space environment. This legislation supports ongoing collaboration between the private sector and the government through the Department of Commerce to develop best practices and to share data.

SpaceX appreciates the Committee's engagement with industry throughout the legislative process and looks forward to continuing to work with the Committee as these issues evolve.

Sincerely,

Tim Hughes
Senior Vice President, Global Business & Government Affairs

1155 F Street, NW Suite 475 Washington, DC 20004
phone 202.649.2703 fax 202.649.2701
spacex.com

MAXAR
TECHNOLOGIES

June 26, 2018

The Honorable Lamar Smith
Chairman
Science, Space, and Technology Committee
U.S. House of Representatives
Washington DC 20515

Dear Chairman Smith:

As the United States continues to lead the way in the commercialization of space, we must also lead the way in managing space as a domain. Among the most important tasks at present are space situational awareness (SSA) and space traffic management (STM). The ability to track objects in space and to plan our activities to minimize damage to assets and the creation of debris is critical to our endeavors.

You and your colleagues on the House Science, Space, and Technology Committee understand this well. Your American Space SAFE Management Act is an important contribution to this vital effort. The bill promotes SSA and STM research and development, which will help modernize the nation's capabilities as tracking and management challenges grow more difficult. It creates a civil SSA program to provide SSA information and to relieve the US Air Force of the burden it currently carries. It creates a pathway for a STM framework with voluntary guidelines, practices, and standards, which will help arrive at best practices without rushing to regulate. And it creates a civil space coordination pilot program that will help improve spaceflight safety by serving as a testbed for communication and coordination among operators.

As one of the world's leading manufacturers, operators, and users of satellites and other space assets, Maxar Technologies supports the objectives of the bill. Thank you for your leadership on this important matter. We look forward to working with you and the Senate as the American Space SAFE Management Act advances.

Sincerely,

Marcy A. Steinke
Senior Vice President
Government Relations & Public Policy

2107 Wilson Boulevard, Suite 110, Arlington, VA 22201 +1 703.480.9589

MADE IN SPACE

Made In Space, Inc.
8226 Philips Hwy
Suite 102
Jacksonville, FL 32256

June 26, 2018

The Honorable Lamar Smith
Chairman
Science, Space, and Technology Committee
U.S. House of Representatives
Washington DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member
Science, Space, and Technology Committee
U.S. House of Representatives
Washington DC 20515

Dear Chairman Smith and Ranking Member Johnson:

Made In Space sees a future where life and work in space are commonplace. As the space-based manufacturing company leading the way toward that future, we envision a space environment full of human activity: satellites, vehicles, habitats, factories, and tourist destinations.

A busy space environment requires good Space Situational Awareness (SSA) and Space Traffic Management (STM) in order to keep space free of conjunctions and resultant debris. Your American Space SAFE Management Act will help the United States develop the kinds of SSA and STM capabilities that will enable the future we envision, which is why Made In Space supports this legislation.

We appreciate the Science, Space, and Technology Committee's attention to this important issue and look forward to working with you as the bill proceeds.

Sincerely,
Made In Space, Inc.

Andrew Rush
President & CEO
andrew@madeinspace.us

SO WITT & ASSOCIATES

28 June 2018

Chairman Smith
US House or Representatives
Science, Space and Technology Committee

Subject: Support of American Space "SAFE" Management Act of 2018

Via: Dr. Mick Mineiro,

Attention: Chairman Smith

Today I rise in support of the American Space "SAFE" Management Act. The time has come for the US Government and industry to turn our telescope around and view the market in a different way. Times have changed and the market is rapidly shifting. A new and enlightening conversation regarding space traffic management is emerging because American industrial excellence has created an emerging need. That is a good problem to have and this bill enables a needed debate on several emerging regulatory matters which must be addressed as the industry accelerates to new heights.

Very Respectfully,

Stuart O. Witt

cc. Congressman Brian Babin, TX

760.382.5757 | STUART@WITTANDASSOC.COM

COMMERCIAL
SPACEFLIGHT
FEDERATION

727 15th Street, NW Suite 800
Washington, DC 20005
26 June 2018

The Honorable Lamar Smith
Chair, Committee on
Science, Space & Technology
U.S. House of Representatives
2320 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Smith:

I am writing to offer the support of the Commercial Spaceflight Federation of the American Space SAFE Management Act.

The 80+ member companies and organizations of CSF appreciate your and your staff's efforts to craft a measured, stepwise approach to "civilianizing" Space Situational Awareness, and taking steps to facilitate the development of technologies, standards, best practices, and voluntary guidelines for appropriate future space traffic coordination efforts.

This legislation represents a very good next step in the legislative process. Our members are continuing to review and provide meaningful input on the bill as it moves through Congress.

We would stress that this legislation, with appropriate minor changes, should be seen as a ceiling on what is appropriate for Congress to legislate at this time. It lays the foundation for focused research and development, consultative program initiation, and efforts to enable future coordination activities, as necessary. While it is important to define and assign initial roles and responsibilities in the relatively near term, Congress cannot effectively anticipate or prejudge how the future of space traffic issues will evolve. Therefore, it is not necessary to grant any agency broad authority to craft regulations when we have not yet defined the best practices, industry standards, and voluntary guidelines that must be shown to be insufficient before regulatory power is granted.

Thank you for the opportunity to express our views to the Committee on this important legislation.

Yours truly,

Eric W. Stallmer
President
Commercial Spaceflight Federation

cc: Hon. Eddie Bernice Johnson
Ranking Member
Committee on Science, Space
and Technology

June 26, 2018

The Honorable Lamar Smith
Chairman
Committee on Science, Space and Technology
U.S. House of Representatives
2321 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Smith,

Bigelow Aerospace (BA) and Bigelow Space Operations (BSO) applaud your efforts on the *American Space Situational Awareness and Framework for Entity Management Act (American Space SAFE Management Act)*. Thank you for continuing to work with the commercial industry on important issues that are vital to a successful space future.

BA and BSO are genuinely dedicated to facilitating commercial human spaceflight in low Earth orbit on commercial space stations. It is desperately necessary that there is a reliable cadence to access commercial platforms. Department of Commerce is appropriately suited to take responsibility of Space Situational Awareness services.

As this nascent industry takes shape, legislation and policy that are supportive of commercial activities are critical to its survival. The significance of space activities is higher than ever before, and ensuring the safety, sustainability and stability of U.S. space operations is of the upmost importance.

Respectfully,

Robert Bigelow

Robert T. Bigelow
President and Program Manager, B330

1899 W. Brooks Avenue N. Las Vegas, NV 89032 Tel: (702) 639-4440 Fax: (702) 688-6776

That concludes my statement.

And do you want to be recognized? No.

And we will now proceed with amendments in the order listed in the roster, and the first amendment on the roster is a manager's amendment, and I'll recognize myself to offer the amendment. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 6226, offered by Mr. Smith of Texas, amendment number 002.

Chairman SMITH. Without objection, the amendment is considered as read, and I recognize myself to explain the amendment.

This amendment represents a good-faith effort to incorporate constructive feedback received from Representative Bera and Representative Perlmutter and other stakeholders after the bill was noticed for markup.

This amendment directs the Secretaries of Commerce and Defense, in coordination with relevant agencies, to submit a plan outlining the transition of space situational awareness information and services program to the Department of Commerce and how a gap in providing SSA information and services will be prevented.

This amendment clarifies that the Secretary of Commerce may leverage existing work force and experience of other Federal agencies.

The amendment also makes it clear that the policy of the United States is to timely develop voluntary civil space traffic coordination guidelines, practices, and standards to ensure a safe operating environment and inform the development of a comprehensive space traffic management framework.

Finally, the Secretary of Commerce is directed to report biannually on recommendations to facilitate the development of a comprehensive space traffic management framework. I firmly believe this amendment improves and strengthens the policy of the *American Space SAFE Management Act*.

And I thank Representatives Bera and Perlmutter for their constructive engagement and negotiation of these policy provisions. It is a better bill as a result.

Is there further discussion?

The gentleman from California, Mr. Bera, the Ranking Member, is recognize for his——

Mr. BERA. Thank you, Mr. Chairman.

Chairman SMITH [continuing]. Comments.

Mr. BERA. As you've already noted, we've had multiple hearings on the complexity of space and the importance of space traffic management, and so I'm glad that this process continues to move forward.

As we discussed at the hearing last week in the Subcommittee, you know, it still remains to be seen what the best transition looks like, but we all agree that there does need to be a transition. And I'm glad that the Chairman was able to direct DOD and Commerce through the manager's amendment and improving the bill to come back to Congress for a report on what this would look like.

I think General Hyten said it best in—you know, when he described, you know, if you're walking on a wing and a wing-walker, you don't let go of one strut until you're firmly holding the next

strut. And, you know, let's make sure have a firm grip on that next strut before we let go of this—the current DOD strategy.

So, again, I thank the Chairman for, you know, accepting some of the suggestions that Mr. Perlmutter and I made, and I think it does make the bill a better bill. And I'll be supporting the bill.

Chairman SMITH. Thank you, Mr. Bera.

And the gentleman from Colorado, Mr. Perlmutter, is recognized.

I might warn the gentleman there's nothing about Mars in this amendment.

Mr. PERLMUTTER. Move to strike the last word.

Chairman SMITH. And the gentleman's recognized for 5 minutes.

Mr. PERLMUTTER. Thanks, Mr. Chairman. And I appreciate the Chairman's willingness to work with me and Congressman Bera in connection with this bill. I think this is an important bill. Obviously, from the testimony we heard last week from General Hyten, Administrator Bridenstine, and Secretary Ross, and we know on this Committee that as we continue to launch, as we continue to add satellites and CubeSats, as the debris continues to mount, we have to have management of the traffic up there.

And within this bill, we talk about space situational awareness. That's really knowing what is up there and where it is, and that would be primarily the Defense Department's responsibility to pinpoint. And then under the bill to have Commerce working with NASA, DOD, and other agencies develop this management plan in case of collisions and figuring out who's in what lane and the like.

And so one of the things that we've done—and I appreciate the majority's willing to work with us in this manager's amendment is to make sure that Commerce has sufficient personnel either through NASA's cooperation or Department of Defense's cooperation to be able to do this right.

And so we'll figure out as we develop this space situational awareness and space traffic management, you know, who's doing what, but we have to get busy. And I appreciate the Chairman's taking this bill and moving forward.

I do want us to continue to visit about this because I think there are some other sections we do need to talk about so that they aren't counterproductive, and that would be the section on immunity, which is found on page 9, lines 3 through 11. We ought to talk about that some more as the bill proceeds.

And then also as to the voluntary guidelines because at some point there needs to be the ability to enforce who's in what lane, who was negligent, who did what. And it's not just going to be a voluntary kind of a setting I don't think because I liken it to actual traffic management here on Earth, to make sure people know how things are being managed and who's in what lane.

But I think this is a—really a good approach. I'm prepared to support it. And I thank the Chairman for working with us in trying to figure out how best to implement this management program.

I yield back.

Chairman SMITH. OK. Thank you, Mr. Perlmutter, for your contributions to the bill through the amendment. And you mentioned liability, which we all know is a delicate balance, but we can continue to try to address that as well.

If there's no further discussion on the amendment, all in favor, say aye.

Those opposed, no.

The ayes have it, and the amendment is agreed to.

We'll now go to what I believe will be the last amendment of the day, and this will be an amendment offered by the Ranking Member, the gentlewoman from Texas, Ms. Johnson. She's recognized for that purpose.

Ms. JOHNSON. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment in the nature of a substitute to H.R. 6226, offered by Ms. Johnson of Texas, amendment number 001.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentlewoman is recognized to explain her amendment.

Ms. JOHNSON. Thank you, Mr. Chairman.

My amendment is very straightforward. It would direct NASA Administrator to enter into an arrangement with the National Academies to carry out an assessment of what capabilities are needed for the provision of civil Federal Government space situational awareness data, information, and services, as well as what capabilities currently exist at Federal agencies to meet these needs.

The assessment would provide a recommendation to Congress as to which agencies should be the lead in delivering the space situational awareness functions. The National Academies would deliver this assessment to Congress within 1 year.

The intent of my amendment is also very straightforward. It is intended to give Congress the information it will need to determine which government agency should be the lead for the provision of civil space situational awareness or SSA. Because we should not simply rubberstamp the Trump Administration's proposal to have the Department of Commerce be the lead agency any more than we should simply adopt the interagency consensus reached in the Obama Administration that FAA should be the lead.

As was strongly argued by at least one Member of the first of last Friday's hearing on SSA, the one we have held on the topic in more than 4 years, the Administration can propose its approach to civil SSA, but Congress then needs to do its job and engage in serious oversight, hold hearings in here from a broad array of stakeholders. Only after it has been done—it has done its own work on the issue and examined the Administration's proposals in depth can Congress make informed decisions about the best way to proceed.

This Committee has somehow found the time to hold at least five hearings under our Chairman on the search of alien life, an interesting topic to be sure, but with little legislative relevance. At the same time, we can't be bothered to seriously investigate the legislative and policy proposals put forth by the current Administration. We're once again rushing to a markup today without having first done our homework and our job as legislators, and so we will once again mark up a bill that has received very little serious scrutiny.

My amendment would allow the rush to be blindly fall in line—would slow the rush to the—blindly fall in line behind this Admin-

istration's plan and instead let us make sure the independent and objective analysis of the National Academies.

Some may say that we can't afford to wait a year to get the information we need, but I ask why not? The DOD is going to continue to provide their SSA services. It is not going to unilaterally walk away from that responsibility. We are not risking anything by taking time to do our job as Members of Congress.

I had planned to offer an amendment that would have assigned the lead SSA responsibility to our Nation's premiere space agency NASA to make the point that there are serious alternatives to Commerce that need to be considered by Congress. In many ways, it makes more sense to assign the role to NASA. NASA already works closely with DOD on SSA and on collision avoidance. It has a wealth of knowledge and experience and resources that it can bring to bear. NASA has demonstrated the ability to garner international support on past issues, and I believe it can do the same for SSA and space traffic management because it is trusted as an unbiased, neutral agency.

Some will say that while NASA is the most qualified civil agency to do the job, they're not a regulatory agency. I agree. NASA is not a regulatory agency. But as I read the bill, there are no regulatory responsibilities defined or mandated in the lead civil agency for SSA. But at the end of the day, I'm not prepared to say that NASA is the answer even if it appears to be an obviously better choice than Commerce.

We simply do not yet have enough information to make an informed decision. This is why we need the National Academies to help us understand these complex issues. We might not agree with the Academies' recommendation, but if in the meantime we are also doing our job as a Committee and holding hearings and getting input from experts and stakeholders, we will be far better prepared to legislate in this area after we get the Academies' assessment.

And there could be serious consequences if we get this wrong. In the past, when Congress has legislated haphazardly and assigned brand-new functions to agencies ill-equipped to deal with them, bad things have happened. Assigned SSA function to an unprepared agency could end up costing the Federal Government a lot of wasted money and time, and we stand up to what is essentially a new agency when other better alternatives may already exist.

In summary, my amendment is really a Science Committee do-your-job amendment, and I urge my colleagues to support it. And I thank you and yield back.

Chairman SMITH. Thank you, Ms. Johnson.

And I'll recognize myself in opposition to the amendment.

This amendment would direct the National Academy of Science to conduct an assessment and recommend a space traffic management framework. I don't think we need to wait for another study on this topic. Congress has asked and received similar studies. Pursuant to the *Commercial Space Launch Competitiveness Act* of 2015, NASA delivered to Congress over 18 months ago a report on, quote, "frameworks for the management of space traffic and orbital activities," end quote.

In addition, the Institute for Defense Analyses did a report, which is publicly available, for the Obama Administration in 2016 evaluating options for civil space situational awareness. It is time for us to act.

As General Hyten and Administrator Bridenstine testified last week, time is critical. The number of commercial satellites in space are predicted to grow from 1,300 active satellites today to more than 10,000 in just the next few years. If we don't develop a space traffic management framework immediately, we risk the safety of the space operational environment, so I have to oppose the amendment.

Is there any further discussion?

If not, the question is on agreeing to the amendment offered by Ms. Johnson.

All in favor, say aye.

Ms. JOHNSON. I ask for record vote.

Chairman SMITH. A recorded vote has been requested, and the clerk will call the roll. And let me say we may be leaving the vote open for a couple of minutes, too, depending on the result. No, I think we've got—I take it back. I think we've got good representation over here. OK.

The CLERK. Mr. Smith?

Chairman SMITH. No.

The CLERK. Mr. Smith votes no.

Mr. Lucas?

Mr. LUCAS. No.

The CLERK. Mr. Lucas votes no.

Mr. Rohrabacher?

Mr. ROHRABACHER. No.

The CLERK. Mr. Rohrabacher votes no.

Mr. Brooks?

Mr. BROOKS. No.

The CLERK. Mr. Brooks votes no.

Mr. Hultgren?

Mr. HULTGREN. No.

The CLERK. Mr. Hultgren votes no.

Mr. Posey?

Mr. POSEY. No.

The CLERK. Mr. Posey votes no.

Mr. Massie?

[No response.]

The CLERK. Mr. Weber?

[No response.]

The CLERK. Mr. Knight?

Mr. KNIGHT. No.

The CLERK. Mr. Knight votes no.

Mr. Babin?

[No response.]

The CLERK. Mrs. Comstock?

[No response.]

The CLERK. Mr. Loudermilk?

Mr. LOUDERMILK. No.

The CLERK. Mr. Loudermilk votes no.

Mr. Abraham?

[No response.]
The CLERK. Mr. Palmer?
Mr. PALMER. No.
The CLERK. Mr. Palmer votes no.
Mr. Webster?
[No response.]
The CLERK. Mr. Biggs?
Mr. BIGGS. No.
The CLERK. Mr. Biggs votes no.
Mr. Marshall?
Mr. MARSHALL. No.
The CLERK. Mr. Marshall votes no.
Mr. Dunn?
Mr. DUNN. No.
The CLERK. Mr. Dunn votes no.
Mr. Higgins?
Mr. HIGGINS. No.
The CLERK. Mr. Higgins votes no.
Mr. Norman?
Mr. NORMAN. No.
The CLERK. Mr. Norman votes no.
Mrs. Lesko?
Mrs. LESKO. No.
The CLERK. Mrs. Lesko votes no.
Ms. Johnson?
Ms. JOHNSON. Aye.
The CLERK. Ms. Johnson votes yes.
Ms. Lofgren?
[No response.]
The CLERK. Mr. Lipinski?
Mr. LIPINSKI. Aye.
The CLERK. Mr. Lipinski votes yes.
Ms. Bonamici?
Ms. BONAMICI. Aye.
The CLERK. Ms. Bonamici votes yes.
Mr. Bera?
Mr. BERA. No.
The CLERK. Mr. Bera votes no.
Ms. Esty?
Ms. ESTY. Aye.
The CLERK. Ms. Esty votes yes.
Mr. Veasey?
Mr. VEASEY. Aye.
The CLERK. Mr. Veasey votes yes.
Mr. Beyer?
[No response.]
The CLERK. Ms. Rosen?
Ms. ROSEN. Aye.
The CLERK. Ms. Rosen votes yes.
Mr. Lamb?
Mr. LAMB. Yes.
The CLERK. Mr. Lamb votes yes.
Mr. McNerney?
Mr. MCNERNEY. Yes.

The CLERK. Mr. McNerney votes yes.

Mr. Perlmutter?

Mr. PERLMUTTER. My Ranking Member makes a lot of good points, but no.

The CLERK. Mr. Perlmutter votes no.

Mr. Tonko?

Mr. TONKO. Aye.

The CLERK. Mr. Tonko votes yes.

Mr. Foster?

Mr. FOSTER. Aye.

The CLERK. Mr. Foster votes yes.

Mr. Takano?

Mr. TAKANO. Aye.

The CLERK. Mr. Takano votes yes.

Ms. Hanabusa?

Ms. HANABUSA. Aye.

The CLERK. Ms. Hanabusa votes yes.

Mr. Crist?

Mr. CRIST. Aye.

The CLERK. Mr. Crist votes yes.

Chairman SMITH. You got back. Thank you. Do we have some—who's on their way? The clerk will report the vote.

The CLERK. Mr. Chairman, 13 Members have voted yes, 17 Members have voted no.

Chairman SMITH. OK. And the amendment is not agreed to.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: June 27, 2018

Bill: H.R. 6226 AMENDMENT NO. 001
ROLL CALL NO. 1

Amendment Sponsor: Rep. Eddie Bernice Johnson (D-TX) DEFEATED

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* – *TX*		X		
2 Mr. LUCAS – *OK* **		X		
3 Mr. ROHRABACHER – *CA*		X		
4 Mr. BROOKS – *AL*		X		
5 Mr. HULTGREN – *IL*		X		
6 Mr. POSEY – *FL*		X		
7 Mr. MASSIE – *KY*				
8 Mr. WEBER – *TX*				
9 Mr. KNIGHT – *CA*		X		
10 Mr. BABIN – *TX*				
11 Mrs. COMSTOCK – *VA*				
12 Mr. LOUDERMILK – *GA*		X		
13 Mr. ABRAHAM – *LA*				
14 Mr. PALMER – *AL*		X		
15 Mr. WEBSTER – *FL*				
16 Mr. BIGGS – *AZ*		X		
17 Mr. MARSHALL – *KS*		X		
18 Mr. DUNN – *FL*		X		
19 Mr. HIGGINS – *LA*		X		
20 Mr. NORMAN – *SC*		X		
21 Mrs. LESKO – *AZ*		X		
22 VACANT				
1 Ms. JOHNSON, *Ranking* – *TX*	X			
2 Ms. LOFGREN – *CA*				
3 Mr. LIPINSKI – *IL*	X			
4 Ms. BONAMICI – *OR*	X			
5 Mr. BERA – *CA*		X		
6 Ms. ESTY – *CT*	X			
7 Mr. VEASEY – *TX*	X			
8 Mr. BEYER – *VA*				
9 Ms. ROSEN – *NV*	X			
10 Mr. LAMB – *PA*	X			
11 Mr. MCNERNEY – *CA*	X			
12 Mr. PERLMUTTER – *CO*		X		
13 Mr. TONKO – *NY*	X			
14 Mr. FOSTER – *IL*	X			
15 Mr. TAKANO – *CA*	X			
16 Ms. HANABUSA – *HI*	X			
17 Mr. CRIST – *FL*	X			
TOTALS	13	17		

** Vice Chair

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 6226, as amended, to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 6226 to the House, as amended.

All those in favor, say aye.

Mr. ROHRABACHER. Mr. Chairman?

Chairman SMITH. Who seeks to be recognized? The gentleman from California in the middle of a vote wants to be recognized.

Mr. ROHRABACHER. I tried to get your attention before you called the vote.

Chairman SMITH. OK. The gentleman is recognized.

Mr. ROHRABACHER. I'll make this very quick. I'd just like to express my strong support for this bill, H.R. 6226. Just to note that I've been working on legislation like this for about 20 years, and so I'm very gratified by your leadership and the unanimity that we have among our colleagues to actually provide a useful nonregulatory approach to dealing with very serious challenges of space debris, space situational awareness, and space traffic coordination.

This act lays the foundation for developing the technologies that will enable private industry and—as well as government and provide the development of the standards and the framework that will lead us to the best solutions of these very serious challenges that, as I say, for 15 years I've been talking about debris, and I'm gratified that we have taken it seriously and that this Administration is taking it seriously.

This is a major step in the right direction that will enable us to deal with roadblocks that if we do not deal with these roadblocks, we will be prevented from utilizing to its best degree the benefits of space for our country and for all mankind.

Thank you, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Rohrabacher, for those constructive comments.

And the gentlewoman from Texas, the Ranking Member, Ms. Johnson, is also recognized for her comments.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

That statement supports why I want us to do our work well, and I want to thank Mr. Rohrabacher for making my point. I will not object to the passing of this legislation, but I want the record to reflect that we have a responsibility to do the work that we were sent here to do for the good of the people of the Nation.

Chairman SMITH. OK. Thank you, too, Ms. Johnson.

The question is on favorably reporting H.R. 6226 to the House, as amended.

All those in favor, say aye.

All those opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 6227 is ordered reported to the House. I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

Before we adjourn, I just want to—this is probably the best turnout we've had of Members of this Committee, and I just appreciate

everybody's participation and presence. And I also want to especially thank the staff. We had staff on both sides of four Subcommittees involved with these three bills, and for some reason Chris Wydler always seems to be in the middle of everything. But anyway, we appreciate the work of all the staff on both sides.

And also, I think this—let me make a rough prediction here that when we finish our suspension votes on the floor this afternoon, I think the Committee will have successfully taken 33 bills to the floor, 30 of which were bipartisan, so it's a credit to Members of this Committee on both sides.

If there's no further discussion, that completes our business. This concludes the Science Committee markup. Without objection, the Committee stands adjourned.

[Whereupon, at 11:19 a.m., the Committee was adjourned.]

Appendix:

H.R. 6227, AMENDMENT ROSTER, H.R. 6229, H.R. 6226, AMENDMENT ROSTER

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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To provide for a coordinated Federal program to accelerate quantum research and development for the economic and national security of the United States.

IN THE HOUSE OF REPRESENTATIVES

Mr. SMITH of Texas introduced the following bill; which was referred to the Committee on _____

A BILL

To provide for a coordinated Federal program to accelerate quantum research and development for the economic and national security of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "National Quantum Initiative Act".

(b) TABLE OF CONTENTS.—

Sec. 1. Short title; table of contents.
Sec. 2. Definitions.
Sec. 3. Purposes.

TITLE I—NATIONAL QUANTUM INITIATIVE

Sec. 101. National Quantum Initiative Program.
Sec. 102. National Quantum Coordination Office.
Sec. 103. Subcommittee on Quantum Information Science.
Sec. 104. National Quantum Initiative Advisory Committee.
Sec. 105. Sunset.

TITLE II—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY QUANTUM ACTIVITIES

Sec. 201. National Institute of Standards and Technology activities and quantum workshop.

TITLE III—NATIONAL SCIENCE FOUNDATION AND MULTIDISCIPLINARY CENTERS FOR QUANTUM RESEARCH AND EDUCATION

Sec. 301. Quantum information science research and education program.
Sec. 302. Multidisciplinary Centers for Quantum Research and Education.

TITLE IV—DEPARTMENT OF ENERGY RESEARCH AND NATIONAL QUANTUM INFORMATION SCIENCE RESEARCH CENTERS

Sec. 401. Quantum Information Science Research program.
Sec. 402. National Quantum Information Science Research Centers.
Sec. 403. Spending limitation.

1 **SEC. 2. DEFINITIONS.**

2 In this Act, the following definitions apply:

3 (1) ADVISORY COMMITTEE.—The term "Advi-
4 sory Committee" means the National Quantum Ini-
5 tiative Advisory Committee established under section
6 104(a).

7 (2) COORDINATION OFFICE.—The term "Co-
8 ordination Office" means the National Quantum Co-
9 ordination Office established under section 102(a).

10 (3) INSTITUTIONS OF HIGHER EDUCATION.—
11 The term "institutions of higher education" has the
12 meaning given the term in section 101(a) of the
13 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

1 (4) PROGRAM.—The term "Program" means
2 the National Quantum Initiative Program imple-
3 mented under section 101(a).
4 (5) QUANTUM INFORMATION SCIENCE.—The
5 term "quantum information science" means the
6 storage, transmission, manipulation, or measurement
7 of information that is encoded in systems that can
8 only be described by the laws of quantum physics.
9 (6) SUBCOMMITTEE.—The term "Sub-
10 committee" means the Subcommittee on Quantum
11 Information Science of the National Science and
12 Technology Council established under section
13 103(a).
14 **SEC. 3. PURPOSES.**
15 The purposes of this Act are to ensure the continued
16 leadership of the United States in quantum information
17 science and its technology applications by—
18 (1) supporting research, development, dem-
19 onstration, and application of quantum information
20 science and technology in order to—
21 (A) expand the number of researchers,
22 educators, and students with training in quan-
23 tum information science and technology to de-
24 velop a workforce pipeline;

1 (B) promote the development and inclusion
2 of multidisciplinary curriculum and research op-
3 portunities for quantum information science at
4 the undergraduate, graduate, and postdoctoral
5 level;
6 (C) address basic research knowledge gaps;
7 (D) promote the further development of fa-
8 cilities and centers available for quantum infor-
9 mation science and technology research, testing
10 and education; and
11 (E) stimulate research on and promote
12 more rapid development of quantum-based tech-
13 nologies;
14 (2) improving the interagency planning and co-
15 ordination of Federal research and development of
16 quantum information science and technology and
17 maximizing the effectiveness of the Federal Govern-
18 ment's quantum information science and technology
19 research and development programs;
20 (3) promoting collaboration among government,
21 Federal laboratories, industry, and universities; and
22 (4) promoting the development of standards for
23 quantum information science and technology secu-
24 rity.

TITLE I—NATIONAL QUANTUM INITIATIVE

SEC. 101. NATIONAL QUANTUM INITIATIVE PROGRAM.

The President shall implement a 10-year National Quantum Initiative Program. In carrying out the Program, the President shall, acting through appropriate Federal agencies, councils, working groups, subcommittees, and the Coordination Office—

(1) establish the goals, priorities, and metrics for a 10-year plan to accelerate development of quantum information science and technology applications in the United States;

(2) invest in fundamental Federal quantum information science and technology research, development, demonstration, and other activities to achieve the goals established in paragraph (1);

(3) invest in activities to develop a quantum information science and technology workforce pipeline;

(4) provide for interagency coordination of Federal quantum information science and technology research, development, demonstration, and other activities undertaken pursuant to the Program;

(5) partner with industry and academia to leverage knowledge and resources; and

1 (6) leverage existing Federal investments effi-
2 ciently to advance Program goals and objectives.

3 **SEC. 102. NATIONAL QUANTUM COORDINATION OFFICE.**

4 (a) ESTABLISHMENT.—The President shall establish
5 a National Quantum Coordination Office, which shall
6 have—

7 (1) a Director appointed by the Director of the
8 Office of Science and Technology Policy, in consulta-
9 tion with the Secretary of Commerce, the Director
10 of the National Science Foundation, and the Sec-
11 retary of Energy; and

12 (2) staff that shall be comprised of employees
13 detailed from the Federal agencies that are members
14 of the Subcommittee.

15 (b) RESPONSIBILITIES.—The Coordination Office
16 shall—

17 (1) provide technical and administrative support
18 to—

19 (A) the Subcommittee; and

20 (B) the Advisory Committee;

21 (2) oversee interagency coordination of the Pro-
22 gram, including encouraging and supporting joint
23 agency solicitation and selection of applications for
24 funding of projects under the Program;

1 (3) serve as the point of contact on Federal ci-
2 vilian quantum information science and technology
3 activities for Government organizations, academia,
4 industry, professional societies, State governments,
5 and others to exchange technical and programmatic
6 information;
7 (4) ensure coordination between the Multidisci-
8 plinary Centers for Quantum Research and Edu-
9 cation established under section 302(b) and the Na-
10 tional Quantum Information Science Research Cen-
11 ters established under section 402(a);
12 (5) conduct public outreach, including dissemi-
13 nation of findings and recommendations of the Advi-
14 sory Committee, as appropriate; and
15 (6) promote access to and early application of
16 the technologies, innovations, and expertise derived
17 from Program activities to agency missions and sys-
18 tems across the Federal Government, and to United
19 States industry, including startup companies.
20 (c) FUNDING.—Funds necessary to carry out the ac-
21 tivities of the Coordination Office shall be made available
22 each fiscal year by the participating agencies of the Sub-
23 committee, as determined by the Director of the Office
24 of Science and Technology Policy.

1 **SEC. 103. SUBCOMMITTEE ON QUANTUM INFORMATION**
2 **SCIENCE.**
3 (a) ESTABLISHMENT.—The President shall establish,
4 through the National Science and Technology Council, a
5 Subcommittee on Quantum Information Science.
6 (b) MEMBERSHIP.—The Subcommittee shall in-
7 clude—
8 (1) the National Institute of Standards and
9 Technology;
10 (2) the National Science Foundation;
11 (3) the Department of Energy;
12 (4) the National Aeronautics and Space Admin-
13 istration;
14 (5) the Department of Defense;
15 (6) the Office of the Director of National Intel-
16 ligence;
17 (7) the Office of Management and Budget;
18 (8) the Office of Science and Technology Policy;
19 and
20 (9) any other Federal agency as considered ap-
21 propriate by the President.
22 (c) CHAIRS.—The Subcommittee shall be jointly
23 chaired by the Director of the National Institute of Stand-
24 ards and Technology, the Director of the National Science
25 Foundation, and the Secretary of Energy.
26 (d) RESPONSIBILITIES.—The Subcommittee shall—

1 (1) coordinate the quantum information science
2 and technology research and education activities and
3 programs of the Federal agencies;
4 (2) establish goals and priorities of the Pro-
5 gram, based on identified knowledge and workforce
6 gaps and other national needs;
7 (3) assess and recommend Federal infrastruc-
8 ture needs to support the Program; and
9 (4) evaluate opportunities for international co-
10 operation with strategic allies on research and devel-
11 opment in quantum information science and tech-
12 nology.
13 (e) STRATEGIC PLAN.—Not later than 1 year after
14 the date of enactment of this Act, the Subcommittee shall
15 develop a 5-year strategic plan, and 6 years after enact-
16 ment of the Act develop an additional 5-year strategic
17 plan, with periodic updates as appropriate to guide the
18 activities of the Program, meet the goals, priorities, and
19 anticipated outcomes of the participating agencies.
20 (f) REPORTS.—The Chairs of the Subcommittee shall
21 submit to the President, the Advisory Committee, the
22 Committee on Science, Space, and Technology of the
23 House of Representatives, the Committee on Commerce,
24 Science, and Transportation and the Committee on En-
25 ergy and Natural Resources of the Senate, and other ap-

1 propriate committees of Congress the strategic plans de-
2 veloped under subsection (e) and any updates to such
3 plans.

4 **SEC. 104. NATIONAL QUANTUM INITIATIVE ADVISORY COM-**
5 **MITTEE.**

6 (a) IN GENERAL.—The President shall establish a
7 National Quantum Initiative Advisory Committee.

8 (b) QUALIFICATIONS.—The Advisory Committee es-
9 tablished by the President under subsection (a) shall con-
10 sist of members from industry, academic institutions, and
11 Federal laboratories. The President shall appoint mem-
12 bers to the Advisory Committee who are qualified to pro-
13 vide advice and information on quantum information
14 science and technology research, development, demonstra-
15 tions, education, technology transfer, commercial applica-
16 tion, or national security and economic concerns.

17 (c) MEMBERSHIP CONSIDERATION.—In selecting an
18 Advisory Committee, the President may seek and give con-
19 sideration to recommendations from the Congress, indus-
20 try, the scientific community (including the National
21 Academy of Sciences, scientific professional societies, and
22 academia), the defense community, and other appropriate
23 organizations.

24 (d) DUTIES.—The Advisory Committee shall advise
25 the President and the Subcommittee and make rec-

1 ommendations that shall be considered in reviewing and
2 revising the Program. The Advisory Committee shall pro-
3 vide the President and the Subcommittee with an inde-
4 pendent assessment of—
5 (1) trends and developments in quantum infor-
6 mation science and technology;
7 (2) progress made in implementing the Pro-
8 gram;
9 (3) whether the Program activities, priorities,
10 and technical goals developed by the Subcommittee
11 are helping to maintain United States leadership in
12 quantum information science and technology;
13 (4) the management, coordination, implementa-
14 tion, and activities of the Program;
15 (5) the need to revise the Program;
16 (6) whether or not there are opportunities for
17 international cooperation with strategic allies on re-
18 search and development in quantum information
19 science and technology; and
20 (7) whether national security, societal, eco-
21 nomic, legal, and workforce concerns are adequately
22 addressed by the Program.
23 (e) REPORTS.—The Advisory Committee shall report,
24 not less frequently than once every 2 years, to the Presi-
25 dent on the assessments required under subsection (d) and

1 any recommendations to improve the Program. The first
2 report under this subsection shall be submitted not later
3 than 6 months after the date of enactment of this Act.
4 The Director of the Office of Science and Technology Pol-
5 icy shall transmit a copy of each report under this sub-
6 section to the Committee on Science, Space, and Tech-
7 nology of the House of Representatives, the Committee on
8 Commerce, Science, and Technology of the Senate, the
9 Committee on Energy and Natural Resources of the Sen-
10 ate, and other appropriate committees of the Congress.
11 (f) TRAVEL EXPENSES OF NON-FEDERAL MEM-
12 BERS.—Non-Federal members of the Advisory Committee,
13 while attending meetings of the Advisory Committee or
14 while otherwise serving at the request of the head of the
15 Advisory Committee away from their homes or regular
16 places of business, may be allowed travel expenses, includ-
17 ing per diem in lieu of subsistence, as authorized by sec-
18 tion 5703 of title 5, United States Code, for individuals
19 in the Government serving without pay. Nothing in this
20 subsection shall be construed to prohibit members of the
21 Advisory Committee who are officers or employees of the
22 United States from being allowed travel expenses, includ-
23 ing per diem in lieu of subsistence, in accordance with ex-
24 isting law.

1 (g) EXEMPTION.—The Advisory Committee shall be
2 exempt from section 14 of the Federal Advisory Com-
3 mittee Act (5 U.S.C. App.).

4 **SEC. 105. SUNSET.**

5 (a) IN GENERAL.—Except as provided for in sub-
6 section (b), the authority to carry out sections 101, 102,
7 103, and 104 shall terminate on the date that is 11 years
8 after the date of enactment of this Act.

9 (b) EXTENSION.—The President may continue the
10 activities under such sections if the President determines
11 that such activities are necessary to meet national eco-
12 nomic or national security needs.

13 TITLE II—NATIONAL INSTITUTE 14 OF STANDARDS AND TECH- 15 NOLOGY QUANTUM ACTIVI- 16 TIES

17 **SEC. 201. NATIONAL INSTITUTE OF STANDARDS AND TECH-**
18 **NOLOGY ACTIVITIES AND QUANTUM WORK-**
19 **SHOP.**

20 (a) NATIONAL INSTITUTE OF STANDARDS AND
21 TECHNOLOGY ACTIVITIES.—As part of the Program de-
22 scribed in title I, the Director of the National Institute
23 of Standards and Technology shall—

24 (1) continue to support and expand basic quan-
25 tum information science and technology research

1 and development of measurement and standards in-
2 frastructure necessary to advance commercial devel-
3 opment of quantum applications;
4 (2) use its existing programs, in collaboration
5 with other agencies, as appropriate, to train sci-
6 entists in quantum information science and tech-
7 nology to increase participation in the quantum
8 fields;
9 (3) establish or expand collaborative ventures or
10 consortia with other public or private sector entities,
11 including academia, National Laboratories, and in-
12 dustry for the purpose of advancing the field of
13 quantum information science and engineering; and
14 (4) have the authority to enter into and per-
15 form such contracts, including cooperative research
16 and development arrangements and grants and coop-
17 erative agreements or other transactions, as may be
18 necessary in the conduct of the work of the Institute
19 and on such terms as the Director considers appro-
20 priate, in furtherance of the purposes of this Act.
21 (b) QUANTUM WORKSHOP.—
22 (1) IN GENERAL.—Not later than 1 year after
23 the date of enactment of this Act, the Director of
24 the National Institute of Standards and Technology
25 shall convene a workshop of stakeholders to discuss

1 the future measurement, standards, cybersecurity,
2 and other appropriate needs for supporting the de-
3 velopment of a robust quantum information science
4 and technology industry in the United States. The
5 goals of the workshop shall be to—
6 (A) assess the current research on the
7 issues described in this paragraph;
8 (B) evaluate the research gaps relating to
9 such issues; and
10 (C) provide recommendations on how the
11 National Institute of Standards and Technology
12 and the Program can address the research
13 needs identified.
14 (2) REPORT TO CONGRESS.—Not later than 2
15 years after the date of enactment of this Act, the
16 Director of the National Institute of Standards and
17 Technology shall transmit to the Committee on
18 Science, Space, and Technology of the House of
19 Representatives and the Committee on Commerce,
20 Science, and Transportation of the Senate a sum-
21 mary report containing the findings of the workshop
22 convened under this section.
23 (c) FUNDING.—The Secretary of Commerce shall de-
24 vote $400,000,000 to carry out this section, which shall
25 include $80,000,000 for each of fiscal years 2019 through

2023, subject to the availability of appropriations, to come from amounts made available for the National Institute of Standards and Technology. This section shall be carried out using funds otherwise appropriated by law after the date of enactment of this Act.

TITLE III—NATIONAL SCIENCE FOUNDATION AND MULTI-DISCIPLINARY CENTERS FOR QUANTUM RESEARCH AND EDUCATION

SEC. 301. QUANTUM INFORMATION SCIENCE RESEARCH AND EDUCATION PROGRAM.

(a) IN GENERAL.—The Director of the National Science Foundation shall carry out a basic research and education program on quantum information science and engineering.

(b) PROGRAM COMPONENTS.—In carrying out the program required under subsection (a), the Director of the National Science Foundation shall carry out activities that continue to support basic interdisciplinary quantum information science and engineering research, and support human resources development in all aspects of quantum information science and engineering. Such activities shall include—

1 (1) using the existing programs of the National
2 Science Foundation, in collaboration with other Fed-
3 eral agencies, as appropriate, to—
4 (A) improve the teaching and learning of
5 quantum information science and engineering
6 at the undergraduate, graduate, and post-
7 graduate levels; and
8 (B) increase participation in the quantum
9 fields, including by individuals identified in sec-
10 tions 33 and 34 of the Science and Engineering
11 Equal Opportunities Act (42 U.S.C. 1885a; 42
12 U.S.C. 1885b);
13 (2) formulating goals for quantum information
14 science and engineering research and education ac-
15 tivities to be supported by the National Science
16 Foundation;
17 (3) leveraging the collective body of knowledge
18 from existing quantum information science and engi-
19 neering research and education activities;
20 (4) coordinating research efforts funded
21 through existing programs across the directorates of
22 the National Science Foundation; and
23 (5) engaging with other Federal agencies, re-
24 search communities, and potential users of informa-
25 tion produced under this section.

1 **SEC. 302. MULTIDISCIPLINARY CENTERS FOR QUANTUM**
2 **RESEARCH AND EDUCATION.**

3 (a) MULTIDISCIPLINARY CENTERS FOR QUANTUM
4 RESEARCH AND EDUCATION.—

5 (1) IN GENERAL.—The Director of the National
6 Science Foundation, in consultation with other Fed-
7 eral agencies as appropriate, shall award grants to
8 institutions of higher education or eligible nonprofit
9 organizations (or consortia thereof) to establish up
10 to 5 Multidisciplinary Centers for Quantum Re-
11 search and Education.

12 (2) COLLABORATIONS.—A collaboration receiv-
13 ing an award under this subsection may include in-
14 stitutions of higher education, eligible nonprofit or-
15 ganizations, and private sector entities.

16 (3) PURPOSE.—The purpose of the Centers
17 shall be to conduct basic research and education ac-
18 tivities in support of the goals and priorities of the
19 Program as determined in title I, to—

20 (A) continue to advance quantum informa-
21 tion science and engineering;

22 (B) support curriculum and workforce de-
23 velopment in quantum information science and
24 engineering; and

25 (C) foster innovation by bringing industry
26 perspectives to quantum research and workforce

1 development, including by leveraging industry
2 resources and research capacity.
3 (4) REQUIREMENTS.—An institution of higher
4 education or an eligible nonprofit organization (or a
5 consortium thereof) seeking funding under this sec-
6 tion shall submit an application to the Director at
7 such time, in such manner, and containing such in-
8 formation as the Director may require. The applica-
9 tion shall include, at a minimum, a description of—
10 (A) how the Center will work with other
11 research institutions and industry partners to
12 leverage expertise in quantum science, edu-
13 cation and curriculum development, and tech-
14 nology transfer;
15 (B) how the Center will promote active col-
16 laboration among researchers in multiple dis-
17 ciplines involved in quantum research including
18 physics, engineering, mathematics, computer
19 science, chemistry, and material science;
20 (C) how the Center will support long-term
21 and short-term workforce development in the
22 quantum field;
23 (D) how the Center can support an innova-
24 tion ecosystem to work with industry to trans-
25 late Center research into applications; and

1 (E) a long-term plan to become self-sus-
2 taining after the expiration of Foundation sup-
3 port.
4 (5) SELECTION AND DURATION.—
5 (A) IN GENERAL.—The Centers selected
6 and established under this section are author-
7 ized to carry out activities for a period of 5
8 years.
9 (B) REAPPLICATION.—An awardee may
10 reapply for an additional, subsequent period of
11 5 years on a competitive, merit-reviewed basis.
12 (C) TERMINATION.—Consistent with the
13 existing authorities of the Foundation, the Di-
14 rector of the National Science Foundation may
15 terminate an underperforming Center for cause
16 during the performance period.
17 (6) FUNDING.—The Director of the National
18 Science Foundation shall devote $250,000,000 to
19 carry out this section, which shall include
20 $50,000,000 for each of fiscal years 2019 through
21 2023, subject to the availability of appropriations, to
22 come from amounts made available for Research and
23 Related Activities and Education and Human Re-
24 sources. This section shall be carried out using

1 funds otherwise appropriated by law after the date
2 of enactment of this Act.
3 (b) GRADUATE TRAINEESHIPS.—The Director of the
4 National Science Foundation may establish a program to
5 provide traineeships to graduate students at institutions
6 of higher education within the United States who are citi-
7 zens of the United States and who choose to pursue mas-
8 ters or doctoral degrees in quantum information science.

9 TITLE IV—DEPARTMENT OF EN-
10 ERGY RESEARCH AND NA-
11 TIONAL QUANTUM INFORMA-
12 TION SCIENCE RESEARCH
13 CENTERS

14 SEC. 401. QUANTUM INFORMATION SCIENCE RESEARCH
15 PROGRAM.

16 (a) IN GENERAL.—The Secretary of Energy shall
17 carry out a basic research program on quantum informa-
18 tion science.
19 (b) PROGRAM COMPONENTS.—In carrying out the
20 program required under subsection (a), the Secretary
21 shall—
22 (1) formulate goals for quantum information
23 science research to be supported by the Department
24 of Energy;

1 (2) leverage the collective body of knowledge
2 from existing quantum information science research;
3 (3) coordinate research efforts funded through
4 existing programs across the Office of Science; and
5 (4) engage with other Federal agencies, re-
6 search communities, and potential users of informa-
7 tion produced under this section.

8 **SEC. 402. NATIONAL QUANTUM INFORMATION SCIENCE RE-**
9 **SEARCH CENTERS.**

10 (a) IN GENERAL.—The Secretary of Energy shall en-
11 sure that the Office of Science carries out a program, in
12 consultation with other Federal agencies, as appropriate,
13 to establish and operate up to 5 National Quantum Infor-
14 mation Science Research Centers to conduct basic re-
15 search to accelerate scientific breakthroughs in quantum
16 information science and technology and to support re-
17 search conducted under section 401. Such centers shall
18 be established through a competitive, merit-reviewed proc-
19 ess, and consider applications from National Laboratories,
20 institutions of higher education, research centers, multi-
21 institutional collaborations, and other appropriate entities.
22 (b) COLLABORATIONS.—A collaboration receiving an
23 award under this subsection may include multiple types
24 of research institutions and private sector entities.

1 (c) REQUIREMENTS.—To the maximum extent prac-
2 ticable, the Centers developed, constructed, operated, or
3 maintained under this section shall serve the needs of the
4 Department of Energy, industry, the academic commu-
5 nity, and other relevant entities to create and develop
6 processes for the purpose of advancing basic research in
7 quantum information science and improving the competi-
8 tiveness of the United States.
9 (d) COORDINATION.—The Secretary shall ensure the
10 coordination of, and avoid unnecessary duplication of, the
11 activities of each Center with the activities of—
12 (1) other research entities of the Department,
13 including the Nanoscale Science Research Centers,
14 the Energy Frontier Research Centers, and the En-
15 ergy Innovation Hubs; and
16 (2) industry.
17 (e) SELECTION AND DURATION.—
18 (1) IN GENERAL.—The centers selected and es-
19 tablished under this section are authorized to carry
20 out activities for a period of 5 years.
21 (2) REAPPLICATION.—An awardee may reapply
22 for an additional, subsequent period of 5 years on a
23 competitive, merit-reviewed basis.
24 (3) TERMINATION.—Consistent with the exist-
25 ing authorities of the Department, the Secretary

1 may terminate an underperforming Center for cause
2 during the performance period.
3 (f) FUNDING.—The Secretary of Energy shall devote
4 $625,000,000 to carry out this section, which shall include
5 $125,000,000 for each of fiscal years 2019 through 2023,
6 subject to the availability of appropriations, to come from
7 amounts made available for the Office of Science. This
8 section shall be carried out using funds otherwise appro-
9 priated by law after the date of enactment of this Act.
10 **SEC. 403. SPENDING LIMITATION.**
11 No additional funds are authorized to be appro-
12 priated to carry out this Act and the amendments made
13 by this Act, and this Act and such amendments shall be
14 carried out using amounts otherwise available for such
15 purpose.

AMENDMENT TO H.R. _____

OFFERED BY MR. HULTGREN OF ILLINOIS

Page 7, line 14, strike "and".

Page 7, line 19, strike the period and insert "; and".

Page 7, after line 19, insert the following:

1 (7) promote access, through appropriate Gov-
2 ernment agencies, to existing quantum computing
3 and communication systems developed by industry,
4 academia, and Federal laboratories to the general
5 user community in pursuit of discovery of the new
6 applications of such systems.

AMENDMENT TO H.R. _____

OFFERED BY MR. ROHRABACHER OF CALIFORNIA

At the end of the bill add the following (and update the table of contents accordingly):

TITLE V—ADMINISTRATIVE PROVISIONS

SEC. 501. NATIONAL NANOTECHNOLOGY PROGRAM TRANSITION.

(a) FINDINGS.—Congress finds the following:

(1) Since the passage of the 21st Century Nanotechnology Research and Development Act in 2003, the National Nanotechnology Initiative (referred to in this section as "NNI") has helped make the United States the global leader in nanotechnology.

(2) From fiscal year 2001 through fiscal year 2015, the Federal Government invested approximately $20.9 billion in nanoscale science, engineering, and technology through the NNI.

(3) After 15 years of the NNI, Federal agencies have well established nanotechnology research and regulatory activities.

1 (4) NNI has helped enabled future United
2 States leadership in quantum information science by
3 supporting research that has been vital to the devel-
4 opment of quantum technologies.
5 (b) SENSE OF CONGRESS.—It is the sense of Con-
6 gress that—
7 (1) the United States should continue to sup-
8 port nanotechnology research and development; and
9 (2) the Federal Government should continue
10 successful nanotechnology activities.
11 (c) TRANSITION.—Not later than 18 months after the
12 date of enactment of this Act, the Director of the Office
13 of Science and Technology Policy shall submit to Congress
14 a plan to continue research in nanotechnology while
15 transitioning the duties and activities of the National
16 Nanotechnology Program and the National Nanotechnol-
17 ogy Coordination Office, established in sections 2 and 3
18 of the 21st Century Nanotechnology Research and Devel-
19 opment Act (15 U.S.C. 7501; 15 U.S.C. 7502), to the ap-
20 propriate Federal agencies and offices.
21 (d) SUNSET OF 21ST CENTURY NANOTECHNOLOGY
22 RESEARCH AND DEVELOPMENT ACT PROVISIONS.—
23 (1) IN GENERAL.—The 21st Century Nanotech-
24 nology Research and Development Act (15 U.S.C.

1 7501 et seq.) is amended by adding at the end the
2 following:

3 **"SEC. 11. SUNSET.**

4 "The authority to carry out sections 2 through 5 shall
5 terminate on the date that is 2 years after the date of
6 enactment of the National Quantum Initiative Act.".

7 (2) CONFORMING AMENDMENTS.—

8 (A) DEPARTMENT OF COMMERCE PRO-
9 GRAMS.—Section 7(a)(1) of the 21st Century
10 Nanotechnology Research and Development Act
11 (15 U.S.C. 7506(a)(1)) is amended by striking
12 "as part of the Program activities under section
13 2(b)(7),".

14 (B) ADDITIONAL CENTERS.—Section 9 of
15 the 21st Century Nanotechnology Research and
16 Development Act (15 U.S.C. 7508) is amended
17 by striking "The Program" each place it ap-
18 pears and inserting "The President".

19 (C) EFFECTIVE DATE.—The amendments
20 made by this paragraph shall take effect on the
21 date that is 2 years after the date of enactment
22 of this Act.

AMENDMENT TO H.R. _____

OFFERED BY MR. FOSTER OF ILLINOIS

Strike section 403 of the bill.

☒

.....
(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To authorize the programs of the National Institute of Standards and Technology, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M._____ introduced the following bill; which was referred to the Committee on _____

A BILL

To authorize the programs of the National Institute of Standards and Technology, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Institute of Standards and Technology Reauthorization Act of 2018".

SEC. 2. AUTHORIZATION OF APPROPRIATIONS.

(a) FISCAL YEAR 2018.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce

1 $1,198,500,000 for the National Institute of Stand-
2 ards and Technology for fiscal year 2018.
3 (2) SPECIFIC ALLOCATIONS.—Of the amount
4 authorized by paragraph (1)—
5 (A) $724,500,000 shall be for scientific
6 and technical research and services laboratory
7 activities;
8 (B) $319,000,000 shall be for the con-
9 struction and maintenance of facilities; and
10 (C) $155,000,000 shall be for industrial
11 technology services activities, of which
12 $140,000,000 shall be for the Manufacturing
13 Extension Partnership program under sections
14 25 and 26 of the National Institute of Stand-
15 ards and Technology Act (15 U.S.C. 278k and
16 278l) and $15,000,000 shall be for the Net-
17 work for Manufacturing Innovation Program
18 under section 34 of the National Institute of
19 Standards and Technology Act (15 U.S.C.
20 278s).
21 (b) FISCAL YEAR 2019.—
22 (1) IN GENERAL.—There are authorized to be
23 appropriated to the Secretary of Commerce
24 $1,115,000,000 for the National Institute of Stand-
25 ards and Technology for fiscal year 2019.

1 (2) SPECIFIC ALLOCATIONS.—Of the amount
2 authorized by paragraph (1)—
3 (A) $850,000,000 shall be for scientific
4 and technical research and services laboratory
5 activities, of which—
6 (i) $109,900,000 shall be for the ad-
7 vanced communications, networks, and sci-
8 entific data systems mission area;
9 (ii) $103,200,000 shall be for the
10 cybersecurity and privacy mission area;
11 (iii) $234,000,000 shall be for the
12 fundamental measurement, quantum
13 science and measurement dissemination
14 mission area; and
15 (iv) $89,800,000 shall be for the
16 physical infrastructure and resilience mis-
17 sion area;
18 (B) $120,000,000 shall be for the con-
19 struction and maintenance of facilities; and
20 (C) $145,000,000 shall be for industrial
21 technology services activities, of which—
22 (i) $140,000,000 shall be for the
23 Manufacturing Extension Partnership pro-
24 gram under sections 25 and 26 of the Na-
25 tional Institute of Standards and Tech-

1 nology Act (15 U.S.C. 278k and 278l);
2 and
3 (ii) $5,000,000 shall be for the Net-
4 work for Manufacturing Innovation Pro-
5 gram under section 34 of the National In-
6 stitute of Standards and Technology Act
7 (15 U.S.C. 278s).

8 **SEC. 3. QUANTUM INFORMATION SCIENCE.**

9 (a) RESEARCH ACTIVITIES AND ENGAGEMENT.—The
10 Secretary, acting through the Director, shall—
11 (1) continue to support and expand basic quan-
12 tum information science and technology research
13 and development of measurement and standards in-
14 frastructure necessary to advance commercial devel-
15 opment of quantum applications;
16 (2) use the programs of the Institute, in col-
17 laboration with other relevant Federal agencies, as
18 appropriate, to train scientists in quantum informa-
19 tion science and technology to increase participation
20 in the quantum fields;
21 (3) establish or expand collaborative ventures or
22 consortia with other public or private sector entities,
23 including other Federal agencies engaged in quan-
24 tum information science research and development,
25 institutions of higher education, National Labora-

1 tories, and industry, for the purpose of advancing
2 the field of quantum information science and engi-
3 neering; and
4 (4) have the authority to enter into and per-
5 form such contracts on such terms as the Secretary,
6 acting through the Director, considers appropriate,
7 including cooperative research and development ar-
8 rangements and grants and cooperative agreements
9 or other transactions, as may be necessary in the
10 conduct of the work of the Institute with respect to
11 quantum information science and technology.
12 (b) QUANTUM WORKSHOP.—
13 (1) IN GENERAL.—Not later than 1 year after
14 the date of the enactment of this Act, the Secretary,
15 acting through the Director, shall convene a work-
16 shop of stakeholders to discuss the future measure-
17 ment, standards, cybersecurity, and other issues that
18 relate to development of quantum information
19 science in the United States. The goals of the work-
20 shop shall be—
21 (A) assessment of the Institute's quantum
22 information science and technology research
23 work, including areas that may need additional
24 Institute investment in order to support devel-

1 opment of quantum information science and
2 technology in the United States; and
3 (B) consideration of recommendations and
4 priority issues for the Institute's participation
5 in the proposed National Quantum Initiative
6 Program.
7 (2) REPORT TO CONGRESS.—Not later than 2
8 years after the date of enactment of this Act, the
9 Secretary, acting through the Director, shall trans-
10 mit to the Committee on Science, Space, and Tech-
11 nology and the Committee on Appropriations of the
12 House of Representatives and the Committee on
13 Commerce, Science, and Transportation and the
14 Committee on Appropriations of the Senate a sum-
15 mary report containing the findings of the workshop
16 convened under this subsection.
17 (c) FUNDING.—The Secretary of Commerce shall de-
18 vote $80,000,000 to carry out this section for fiscal year
19 2019, subject to the availability of appropriations, to come
20 from amounts made available pursuant to section
21 2(b)2(A)(iii) of this Act. This section shall be carried out
22 using funds otherwise appropriated by law after the date
23 of enactment of this Act.

SEC. 4. CYBERSECURITY.

(a) ASSISTANCE TO FEDERAL AGENCIES.—The Secretary, acting through the Director, shall enhance and expand the Institute's guidance and assistance to Federal agencies to help such agencies effectively use the Framework, including by providing technical guidance and education and training of—

(1) agency staff responsible for cybersecurity, consultative services, and other assistance at such agencies; and

(2) individual inspectors general and staff of such agencies who are responsible for the annual independent evaluation required under section 3555 of title 44, United States Code.

(b) REPORT.—Not later than 12 months after the date of the enactment of this Act, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report describing the implementation of the activities described in this section in as much detail as possible, including the identification of Federal agencies assisted pursuant to subsection (a) and the types of consultative services, education, guidance, assistance, and training provided to such agencies and inspectors general of such agencies pursuant to such subsection.

1 (c) RESEARCH.—The Secretary, acting through the
2 Director, shall expand the fundamental and applied re-
3 search carried out by the Institute to address key ques-
4 tions relating the measurement of privacy, security, and
5 vulnerability of software tools and communications net-
6 works, including through—
7 (1) the development of research and engineering
8 capabilities to provide practical solutions, including
9 measurement techniques and engineering toolkits, to
10 solve cybersecurity challenges such as human fac-
11 tors, identity management, network security, pri-
12 vacy, and software;
13 (2) investment in tools to help private and pub-
14 lic sector organizations measure their cybersecurity,
15 manage their risks and ensure workforce prepared-
16 ness for new cybersecurity challenges; and
17 (3) investment in programs to prepare the
18 United States with strong cybersecurity and
19 encryption technologies to apply to emerging tech-
20 nologies such as artificial intelligence, the internet of
21 things, and quantum computing.
22 (d) AUTHORITY.—The Secretary, acting through the
23 Director, shall have the authority to enter into and per-
24 form such contracts on such terms as the Secretary con-
25 siders to be appropriate, including cooperative research

1 and development arrangements, grants, and cooperative
2 agreements or other transactions, as may be necessary in
3 the conduct of the work of the Institute with respect to
4 cybersecurity.

5 **SEC. 5. COMPOSITES RESEARCH.**

6 (a) RESEARCH.—The Secretary, acting through the
7 Director, shall implement the recommendations contained
8 in the December 2017 report entitled "Road Mapping
9 Workshop Report on Overcoming Barriers to Adoption of
10 Composites in Sustainable Infrastructure", as appro-
11 priate, to help facilitate the adoption of composite tech-
12 nology in infrastructure in the United States. In imple-
13 menting such recommendations, the Secretary, acting
14 through the Director shall, with respect to the use of com-
15 posite technology in infrastructure—

16 (1) not later than 6 months after the date of
17 enactment of this Act, establish a design data clear-
18 inghouse to identify, gather, validate, and dissemi-
19 nate existing design criteria, tools, guidelines, and
20 standards; and

21 (2) develop methods and resources required for
22 testing an evaluation of safe and appropriate uses of
23 composite materials for infrastructure, including—

24 (A) conditioning protocols, procedures and
25 models;

1 (B) screening and acceptance tools; and
2 (C) minimum allowable design data sets
3 that can be converted into design tools.
4 (b) STANDARDS COORDINATION.—The Secretary,
5 acting through the Director, shall assure that the appro-
6 priate Institute staff consult regularly with standards de-
7 velopers, members of the composites industry, institutions
8 of higher education, and other stakeholders in order to fa-
9 cilitate the adoption of standards for use of composite ma-
10 terials in infrastructure that are based on the research and
11 testing results and other information developed by the In-
12 stitute.
13 (c) FUNDING.—The Secretary of Commerce shall de-
14 vote $11,000,000 to carry out this section for fiscal year
15 2019, subject to the availability of appropriations, to come
16 from amounts made available pursuant to section
17 2(b)(2)(A)(iv) of this Act. This section shall be carried out
18 using funds otherwise appropriated by law after the date
19 of enactment of this Act.
20 **SEC. 6. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE.**
21 The Secretary, acting through the Director, shall con-
22 tinue to support the development of artificial intelligence
23 and data science, including through—
24 (1) the expansion of the Institute's capabilities,
25 including scientific staff and research infrastructure;

1 (2) the implementation of rigorous scientific
2 testing to support the development of trustworthy
3 and safe artificial intelligence and data systems; and
4 (3) the development of machine learning and
5 other artificial intelligence applications to support
6 measurement science research programs and take
7 steps to modernize the Institute's research infra-
8 structure.

9 **SEC. 7. INTERNET OF THINGS.**

10 The Secretary, acting through the Director, shall con-
11 tinue to conduct research with respect to and support the
12 expanded connectivity, interoperability, and security of
13 interconnected systems and other aspects of the internet
14 of things, including through—
15 (1) the development of new tools and meth-
16 odologies for cybersecurity of the internet of things;
17 (2) the development of technologies to address
18 network congestion and device interference, such as
19 the development of testing tools for next generation
20 wireless communications, internet of things proto-
21 cols, coexistence of wireless communications systems,
22 and spectrum sharing;
23 (3) convening experts in the public and private
24 sectors to develop recommendations for accelerating
25 the adoption of sound interoperability standards,

1 guidelines, and best practices for the internet of
2 things; and
3 (4) the development and publication of new
4 cybersecurity tools, encryption methods, and best
5 practices for internet of things security.

6 **SEC. 8. HIRING AND MANAGEMENT.**

7 (a) APPOINTMENTS.—The Secretary, acting through
8 the Director shall have the authority to—
9 (1) make appointments of scientific, engineer-
10 ing, and professional personnel without regard to the
11 civil service laws as the Secretary, acting through
12 the Director determines necessary for carrying out
13 research and development functions which require
14 the services of specially qualified personnel relating
15 to cybersecurity and quantum information science
16 and technology and such other areas of national re-
17 search priorities as the Secretary, acting through the
18 Director may determine; and
19 (2) fix the basic pay of such personnel at a rate
20 to be determined by the Secretary, acting through
21 the Director at rates not in excess of the basic rate
22 of pay of the Vice President under section 104 of
23 title 3, United States Code, without regard to the
24 civil service laws.

1 (b) LIMITATION.—The Director may appoint not
2 more than 10 individuals under this section.

3 **SEC. 9. DEFINITIONS.**

4 In this Act:

5 (1) The term "Director" means the Director of
6 the National Institute of Standards and Technology.

7 (2) The term "Framework" means the Frame-
8 work for Improving Critical Infrastructure
9 Cybersecurity developed by the National Institute of
10 Standards and Technology and referred to in Execu-
11 tive Order 13800 issued on May 11, 2017 (82 Fed.
12 Reg. 22391 et seq.).

13 (3) The term "Institute" means the National
14 Institute of Standards and Technology.

15 (4) The term "institution of higher education"
16 has the meaning given such term in section 101 of
17 the Higher Education Act of 1965 (20 U.S.C.
18 1001).

19 (5) The term "Secretary" means the Secretary
20 of Commerce.

AMENDMENT TO _____

OFFERED BY MRS. COMSTOCK OF VIRGINIA

[Page and line numbers refer to NIST_2018_005 posted to Science, Space, and Technology committee website with timestamp of June 22, 2018 at 2:03PM.]

Page 2, line 11, strike "activities, of which" and all that follows through the period on line 20, and insert "activities.".

Page 2, line 24, strike "$1,115,000,000" and insert "$1,125,000,000".

Page 3, line 20, strike "$145,000,000" and insert "$155,000,000".

Page 3, line 21, strike "activities, of which—" and all that follows through the period on page 4, line 7, and insert "activities.".

Page 6, line 21, strike "2(b)2(A)(iii)" and insert "2(b)(2)(A)(iii)".

Page 7, line 8, strike "cybersecurity," and all that follows through "; and" on line 10, and insert "cybersecurity; and".

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.....
(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To direct the Secretary of Commerce to provide for civil space situational awareness services and information, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. SMITH of Texas introduced the following bill; which was referred to the Committee on _____

A BILL

To direct the Secretary of Commerce to provide for civil space situational awareness services and information, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "American Space Situational Awareness and Framework for Entity Management Act" or the "American Space SAFE Management Act".

SEC. 2. DEFINITIONS.

In this Act:

1 (1) APPROPRIATE COMMITTEES OF CON-
2 GRESS.—The term "appropriate committees of Con-
3 gress" means the Committee on Science, Space, and
4 Technology of the House of Representatives and the
5 Committee on Commerce, Science, and Transpor-
6 tation of the Senate.
7 (2) NASA.—The term "NASA" means the Na-
8 tional Aeronautics and Space Administration.

9 **SEC. 3. NATIONAL CIVIL SPACE SITUATIONAL AWARENESS**
10 **AND SPACE TRAFFIC MANAGEMENT SCIENCE**
11 **AND TECHNOLOGY PLAN.**

12 (a) POLICY.—It is the policy of the United States to
13 encourage the coordination of public and private sector
14 science and technology activities to improve space situa-
15 tional awareness and space traffic management.
16 (b) PLAN.—Not later than 180 days after the date
17 of enactment of this Act, the Administrator of NASA, in
18 consultation with other Federal departments and agencies,
19 as appropriate, shall develop and submit to the appro-
20 priate committees of Congress a national civil space situa-
21 tional awareness and space traffic management science
22 and technology plan.
23 (c) PURPOSE.—The Plan developed under subsection
24 (b) shall carry out the policy set forth under subsection
25 (a) by identifying and prioritizing civil space situational

1 awareness and space traffic management research and de-
2 velopment activities in support of the activities to be con-
3 ducted pursuant to sections 4 and 5.
4 (d) CONTENTS.—The plan developed under sub-
5 section (b) shall include recommendations—
6 (1) to improve coordination among Federal de-
7 partments and agencies on civil space situational
8 awareness and space traffic management research
9 and development;
10 (2) to promote and facilitate private investment
11 in civil space situational awareness and space traffic
12 management research and development;
13 (3) to identify current and project future pri-
14 vate investment in civil space situational awareness
15 and space traffic management research and develop-
16 ment;
17 (4) to work proactively with the private sector
18 to avoid competing with, disincentivizing, or other-
19 wise discouraging private sector research and devel-
20 opment investment; and
21 (5) to prioritize Federal Government invest-
22 ments in civil space situational awareness and space
23 traffic management research and development to
24 occur over a 5-year funding period.

1 (e) AVAILABILITY.—The Administrator shall ensure
2 that the plan developed under subsection (b), and any up-
3 dates to such plan, are made available on a publicly acces-
4 sible website and published in the Federal Register.
5 (f) UPDATED PLAN.—Every 5 years, the Adminis-
6 trator shall update the plan and submit the updated plan
7 to the appropriate committees of Congress.
8 (g) ANNUAL BUDGET.—In submitting each annual
9 budget request to Congress, the President shall identify
10 activities to implement the plan.
11 (h) CENTER FOR CIVIL SPACE SITUATIONAL AWARE-
12 NESS AND SPACE TRAFFIC MANAGEMENT SCIENCE AND
13 TECHNOLOGY EXCELLENCE.—
14 (1) ESTABLISHMENT.—The Administrator of
15 NASA shall establish, through a competitive process,
16 a Center for Civil Space Situational Awareness and
17 Space Traffic Management Science and Technology
18 Excellence at a United States academic institution
19 or institutions.
20 (2) PURPOSE.—The purpose of the Center es-
21 tablished under paragraph (1), taking into account
22 the plan established in this section, shall be to de-
23 velop, lead, and promote research that furthers civil
24 space situational awareness, space traffic coordina-
25 tion, and space traffic management.

1 (3) FUNDING.—NASA shall devote not less
2 than $2,000,000 to carry out this subsection for
3 each of fiscal years 2019 through 2023, subject to
4 the availability of appropriations, to come from
5 amounts made available for NASA. This subsection
6 shall be carried out using funds otherwise appro-
7 priated by law after the date of enactment of this
8 Act.

9 **SEC. 4. CIVIL SPACE SITUATIONAL AWARENESS PROGRAM.**

10 (a) FINDINGS.—Congress finds that—

11 (1) commercial activity in space is accelerating
12 and the United States has a growing commercial
13 space market;

14 (2) the number of launches and satellites in
15 orbit will grow significantly in the near future, in-
16 creasing the number of objects, satellites, and de-
17 bris, and the risk of collisions; and

18 (3) responsible space operations has large impli-
19 cations for the sustainability of space activities, and
20 in turn the prosperity and national security of the
21 United States.

22 (b) POLICY.—It is the policy of the United States to
23 establish and maintain a civil space situational awareness
24 program that provides the public space situational aware-
25 ness information and services in order to facilitate a safe

1 operational environment. The Program established under
2 subsection (c) shall facilitate and promote opportunities
3 for United States private sector providers of space situa-
4 tional awareness data, information, and services to partici-
5 pate in and contribute to the Program. The Program shall
6 promote broad participation from both domestic and inter-
7 national spacecraft operators.

8 (c) ESTABLISHMENT.—No later than 1 year after the
9 date of enactment of this Act, the Secretary of Commerce
10 shall establish a civil space situational awareness program
11 (in this section, referred to as the "Program") to provide
12 space situational awareness services and information to,
13 and obtain space situational awareness data and informa-
14 tion from, eligible entities described under subsection (e),
15 in accordance with this section.

16 (d) CONSULTATION.—In developing the Program, the
17 Secretary of Commerce shall consult with—

18 (1) other Federal departments and agencies, as
19 the Secretary considers appropriate; and

20 (2) the United States private sector and aca-
21 demia.

22 (e) ELIGIBLE ENTITIES.—The Secretary may provide
23 services and information under the Program to, and may
24 obtain data and information from, an entity, including any
25 of the following:

1 (1) A State.
2 (2) A political subdivision of a State.
3 (3) A United States commercial entity.
4 (4) The government of a foreign country.
5 (5) A foreign commercial entity.
6 (f) USER FEES.—
7 (1) NO FEE FOR BASIC SET.—In providing
8 space situational awareness services and information
9 under the Program, the Secretary shall provide a
10 basic set of such services and information, as deter-
11 mined by the Secretary, without charging a user fee.
12 (2) ADDITIONAL SERVICES AND INFORMA-
13 TION.—The Secretary is authorized to charge a rea-
14 sonable user fee for any additional space situational
15 awareness services and information not provided
16 under paragraph (1).
17 (3) STATUTORY CONSTRUCTION.—Nothing in
18 this subsection shall be construed to preclude private
19 sector entities from charging a user fee for providing
20 space situational awareness services and informa-
21 tion.
22 (g) QUALITY OF SERVICES AND INFORMATION.—The
23 Program shall provide space situational awareness services
24 and information that are as good as or better than the
25 services and information provided pursuant to section

1 2274 of title 10, United States Code, as determined by
2 the Secretary.

3 (h) SPACE SITUATIONAL AWARENESS DATA
4 TESTBED.—In carrying out the Program, the Secretary
5 shall provide for a space situational awareness data
6 testbed to facilitate innovation in the use of space situa-
7 tional awareness data to support space situational aware-
8 ness services that may be provided by the Federal Govern-
9 ment or the private sector. The testbed shall allow the
10 public to access such space situational awareness data, in-
11 cluding United States Government data, as the Secretary
12 considers appropriate. The Secretary shall place condi-
13 tions on such data in consultation with appropriate Fed-
14 eral departments and agencies to protect United States
15 national security and foreign policy interests.

16 (i) PROMOTING PRIVATE SECTOR SOLUTIONS.—The
17 Secretary shall facilitate and promote opportunities for
18 United States private sector providers of space situational
19 awareness data, information, and services to participate
20 in and contribute to the Program.

21 (j) ROLE OF NASA.—In carrying out the Program,
22 the Secretary of Commerce may use, on a reimbursable
23 basis and to the greatest extent practicable, NASA's exist-
24 ing infrastructure, workforce, and experience relating to
25 space situational awareness, including conjunction assess-

1 ments that NASA provides for NASA robotic and crewed
2 operations.

3 (k) IMMUNITY.—The United States, any agencies and
4 instrumentalities thereof, including the Department of
5 Commerce and NASA, and any individuals, firms, cor-
6 porations, and other persons acting for the United States,
7 shall be immune from any suit in any court for any cause
8 of action arising from the provision or receipt of space
9 situational awareness services or information, whether or
10 not provided in accordance with this section, or any re-
11 lated action or omission.

12 (l) QUARTERLY BRIEFING.—The Department of
13 Commerce and NASA shall brief the appropriate commit-
14 tees of Congress quarterly, beginning on the date that is
15 3 months after the date of enactment of this Act, on the
16 status of, and all progress, changes, and other develop-
17 ments related to, carrying out the Program.

18 (m) PROGRAM USERS.—The Secretary shall, to the
19 maximum extent feasible and as soon as is practicable
20 after the establishment of the Program, engage with and
21 solicit feedback from stakeholders that are contributors to
22 or recipients of space situational awareness services and
23 information under the Program in order to, at a minimum,
24 receive practical information on the effectiveness of the

1 Program and receive recommendations on how to improve
2 the Program.
3 (n) STATUTORY CONSTRUCTION.—Nothing in this
4 section may be construed to modify any other authorities
5 for the Federal Government to provide space situational
6 awareness services and information to the public.
7 (o) FUNDING.—The Secretary shall devote no less
8 than $20,000,000 to carry out this section for each of fis-
9 cal years 2019 through 2023, subject to the availability
10 of appropriations, to come from amounts made available
11 for the Office of the Secretary. This section shall be car-
12 ried out using funds otherwise appropriated by law after
13 the date of enactment of this Act.
14 **SEC. 5. SPACE TRAFFIC MANAGEMENT FRAMEWORK.**
15 (a) FINDINGS.—Congress finds the following:
16 (1) The United States has the capability to rap-
17 idly develop voluntary civil space traffic coordination
18 guidelines, practices, and standards.
19 (2) It is in the national interest that the United
20 States leads the world in the development of vol-
21 untary civil space traffic coordination guidelines,
22 practices, and standards in cooperation with the pri-
23 vate sector in the United States.
24 (3) The United States should promote the
25 international adoption of such civil space traffic co-

1 ordination guidelines, practices, and standards devel-
2 oped in the United States.
3 (4) Establishing voluntary civil space traffic co-
4 ordination guidelines, practices, and standards is an
5 important first step in developing a comprehensive
6 space traffic management framework.
7 (b) POLICY.—It is the policy of the United States to
8 timely develop voluntary civil space traffic coordination
9 guidelines, practices, and standards to ensure a safe oper-
10 ational environment.
11 (c) VOLUNTARY CIVIL SPACE TRAFFIC COORDINA-
12 TION GUIDELINES, PRACTICES, AND STANDARDS.—
13 (1) IN GENERAL.—The Secretary of Commerce
14 shall, in consultation with appropriate governmental
15 and nongovernmental entities, promote the develop-
16 ment of voluntary civil space traffic coordination
17 guidelines, practices, and standards to ensure a safe
18 operational environment.
19 (2) GUIDELINES.—
20 (A) IN GENERAL.—Not later than 1 year
21 after the date of the enactment of this Act, the
22 Secretary of Commerce shall publish voluntary
23 civil space traffic coordination guidelines. Such
24 guidelines shall be developed in consultation
25 with other relevant Federal agencies, domestic

1 private entities (including entities in the com-
2 mercial sector and institutions of higher edu-
3 cation (as such term is defined in section 101
4 of the Higher Education Act of 1965 (20
5 U.S.C. 1001))).
6 (B) PUBLIC COMMENT.—To facilitate and
7 assure ample opportunity for input from domes-
8 tic private entities specified in subparagraph
9 (A), during the period in which the development
10 of the guidelines under such subparagraph oc-
11 curs, the Secretary of Commerce shall allow for
12 a public comment period to identify key issues,
13 trends, and needs that should be addressed dur-
14 ing the period of that development.
15 (C) USE OF GUIDELINES.—Federal agen-
16 cies operating spacecraft shall, to the extent
17 practicable and taking into account the national
18 security interests of the United States in oper-
19 ating such spacecraft, follow the guidelines
20 issued under subparagraph (A).
21 (d) PILOT PROGRAM.—
22 (1) IN GENERAL.—Not later than 18 months
23 after the date of enactment of this Act, the Sec-
24 retary of Commerce shall establish a civil space traf-
25 fic coordination pilot program under which the Sec-

1 retary will, using the guidelines, practices, and
2 standards developed under subsection (c) to the
3 greatest extent practicable, facilitate communication,
4 coordination, negotiation, and resolution among do-
5 mestic and international civil spacecraft operators
6 (including governmental and private entities oper-
7 ating such spacecraft) for the purposes of improving
8 the safety of spaceflight. The Secretary shall, to the
9 greatest extent practicable, incentivize participation
10 in the pilot program. Nothing in the preceding sen-
11 tence shall be construed as requiring a private entity
12 to participate in such pilot program.

13 (2) PUBLIC COMMENT.—Before establishing the
14 pilot program under this subsection, the Secretary of
15 Commerce shall publish information about the pro-
16 gram's details in the Federal Register and allow for
17 public comment for a reasonable period that ends
18 before the date of such establishment.

19 (3) DURATION.—The authority to carry out the
20 pilot program under this subsection shall terminate
21 on the date that is 5 years after the pilot program
22 under paragraph (1) is established.

23 (4) PILOT PROGRAM PARTICIPANTS.—The Sec-
24 retary shall, to the maximum extent feasible and as
25 soon as is practicable after the date on which the

1 pilot program is established under paragraph (1),
2 engage with and solicit feedback from pilot program
3 participants, in order to, at minimum, receive prac-
4 tical information on the effectiveness of the pilot
5 program and receive recommendations on how to im-
6 prove the pilot program.

7 (5) FUNDING.—The Secretary of Commerce
8 shall devote no less than $5,000,000 for each of fis-
9 cal years 2019 through 2023 to carry out this sub-
10 section, subject to the availability of appropriations,
11 to come from amounts made available for the Office
12 of the Secretary. This subsection shall be carried out
13 using funds otherwise appropriated by law after the
14 date of enactment of this Act.

15 (e) REPORTS.—

16 (1) SPACE TRAFFIC COORDINATION STAND-
17 ARDS.—Not later than 180 days after the date of
18 the enactment of this Act, the Secretary of Com-
19 merce shall submit to the appropriate committees of
20 Congress a report on the role the Department of
21 Commerce, including the National Institute of
22 Standards and Technology, will have in the develop-
23 ment of civil space traffic coordination standards for
24 purposes of promoting innovation and the competi-
25 tiveness of the United States.

1 (2) REPORT ON NEXT STEPS FOR SPACE TRAF-
2 FIC MANAGEMENT FRAMEWORK.—Beginning not
3 later than 1 year after the date of the enactment of
4 this Act and every 2 years thereafter, the Secretary
5 of Commerce shall submit to the appropriate com-
6 mittees of Congress a report on, for the period cov-
7 ered by the report—
8 (A) the state of domestic and international
9 civil space traffic management, including vol-
10 untary or legally binding guidelines, practices,
11 and standards; and
12 (B) the Secretary's recommendations on
13 what steps should be taken by the United
14 States to facilitate further development and
15 adoption of the guidelines, practices, and stand-
16 ards developed under subsection (c) and coordi-
17 nation carried out pursuant to subsection (d).

AMENDMENT TO H.R. _____

OFFERED BY MR. SMITH OF TEXAS

Page 6, line 14, strike "subsection (e)" and insert "subsection (f)".

Page 6, after line 21, insert the following (and redesignate accordingly):

1 (e) TRANSITION PLAN.—No later than 6 months
2 after the date of enactment of this Act, the Secretaries
3 of Commerce and Defense, in coordination with relevant
4 agencies, shall submit a plan to the appropriate commit-
5 tees of Congress outlining the transition of a space situa-
6 tional awareness information and services program to the
7 Department of Commerce and how a gap in providing
8 space situational awareness information and services will
9 be prevented. The Transition Plan shall identify the capa-
10 bilities the Department of Commerce will require to carry
11 out the space situational awareness responsibilities, in-
12 cluding workforce, facilities, and training; the cost of those
13 capabilities; and the estimated date when those capabili-
14 ties will be in place. In addition, the Transition Plan shall
15 describe how the Department of Commerce will structure

1 any partnerships with commercial and international enti-
2 ties.

Page 8, line 21, insert "implementing and" before "carrying out the Program".

Page 9, after line 2, insert the following (and redesignate accordingly):

3 (k) OTHER FEDERAL AGENCIES.—In implementing
4 and carrying out the Program, the Secretary of Commerce
5 may leverage existing workforce and experience of other
6 Federal agencies relating to space situational awareness
7 for the training of staff and other needs as determined
8 by the Secretary.

Page 11, line 10, insert "and inform development of a comprehensive space traffic management framework" before the period.

Page 15, strike lines 12 through 17 and insert the following:

9 (B) the Secretary's recommendations on
10 what steps should be taken by the United
11 States to facilitate—
12 (i) further development and adoption
13 of the guidelines, practices, and standards
14 developed under subsection (c);

(ii) coordination carried out pursuant to subsection (d); and

(iii) development of a comprehensive space traffic management framework.

☒

AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. _____ OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS

[Amendment drafted to version of SSA_001 posted on Science, Space, and Technology committee website with the timestamp of June 22, 2018 at 10:27AM)]

Strike all after the enacting clause and insert the following:

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the "Capabilities Assess-
3 ment for Space Situational Awareness and Space Safety
4 Support Act of 2018".

5 **SEC. 2. CAPABILITIES ASSESSMENT.**

6 (a) ASSESSMENT.—Subject to subsection (b), the Ad-
7 ministrator of the National Aeronautics and Space Admin-
8 istration (in this section referred to as the "Adminis-
9 trator") shall enter into an arrangement with the National
10 Academies of Sciences, Engineering, and Medicine to
11 carry out an assessment of the capabilities and skills of
12 civil Federal Government entities related to the provision
13 of space situational awareness data, information, and serv-
14 ices. The assessment shall—

1 (1) identify and assess such capabilities and
2 skills for managing and providing space situational
3 awareness data, information, and services to civil
4 Federal Government entities and any other relevant
5 entities, including commercial and foreign operators;
6 (2) identify the capabilities, skills, and facilities
7 needed for a civil Federal Government entity to pro-
8 vide nonregulatory space safety operational support;
9 (3) identify issues, including accountability, en-
10 forcement, insurance, and international governance,
11 and make recommendations related to a civil Federal
12 Government entity providing space safety support;
13 (4) identify and prioritize approaches for
14 transitioning the provision of civil space situational
15 awareness data, information, and services currently
16 with the Department of Defense to a civil Federal
17 Government entity;
18 (5) recommend a lead civil Federal Government
19 entity to carry out the provision of civil space situa-
20 tional awareness data, information, and services;
21 (6) identify the capabilities, skills, and facilities
22 needed for a civil Federal Government entity to pro-
23 vide regulatory space traffic coordination; and
24 (7) identify issues, including accountability, en-
25 forcement, insurance, and international governance,

1 and make recommendations for a framework or
2 strategy for the eventual provision by a civil Federal
3 Government entity of regulatory space traffic coordi-
4 nation.
5 (b) ARRANGEMENT.—
6 (1) IN GENERAL.—The Administrator shall re-
7 quest the National Academies of Science, Engineer-
8 ing, and Medicine to conduct the study required by
9 subsection (a) under an arrangement under which
10 the actual expenses incurred by such Academies in
11 conducting such study will be paid by the Adminis-
12 trator. If the Academies are willing to do so, the Ad-
13 ministrator shall enter into such an arrangement
14 with such Academies for the conduct of such study.
15 (2) REFUSAL.—If the National Academies of
16 Science, Engineering, and Medicine are unwilling to
17 conduct such study under such an arrangement,
18 then the Administrator shall enter into a similar ar-
19 rangement with other appropriate nonprofit private
20 groups or associations under which such groups or
21 associations will conduct such study and prepare and
22 submit the reports thereon as provided in subsection
23 (c).
24 (3) CONSULTATION.—The National Academies
25 of Science, Engineering, and Medicine or other

1 group or association conducting the study required
2 by subsection (a) shall conduct such study in con-
3 sultation with the Administrator.
4 (c) TRANSMITTAL.—Not later than 13 months after
5 the date of the enactment of this Act, the assessment con-
6 ducted under subsection (a) shall be transmitted to the
7 Committee on Science, Space, and Technology and the
8 Committee on Armed Services of the House of Represent-
9 atives and the Committee on Commerce, Science, and
10 Transportation and the Committee on Armed Services of
11 the Senate.
12 (d) DEFINITIONS.—In this section, the term "civil
13 Federal Government entity" refers to any Federal agency
14 (including any service, department, or other subdivision
15 thereof) other than the Department of Defense (or any
16 service, department, or other subdivision thereof).

PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 6398, DEPARTMENT OF ENERGY VETERANS' HEALTH INITIATIVE ACT

WEDNESDAY, JULY 18, 2018

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:09 a.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order. Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee rule 2(e) and House rule XI(2)(h)(4), the Chair announces that he may postpone roll call votes on the following bill, which we meet to consider, H.R. 6398, the *Department of Energy Veterans' Health Initiative Act*.

I now recognize myself for an opening statement.

Today, we consider H.R. 6398, the *Department of Energy Veterans' Health Initiative Act*, introduced by Energy Subcommittee Member Ralph Norman and co-sponsored by joint Veterans Affairs and Science Committee Members Neal Dunn and Clay Higgins, as well as 12 other Science Committee Members.

This legislation authorizes the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to solve complex, big-data challenges focused on veterans' health care and basic science.

Currently, DOE and the VA collaborate through the Million Veterans Program-Computational Health Analytics for Medical Precision to Improve Outcomes Now, or MVP-CHAMPION program, which is the longest acronym I've ever encountered. And I forgot to ask which staff Member came up with that. We'll talk later on. Oh, DOE, OK.

Through this initiative, the VA collects genomic and healthcare data from veterans who volunteer for the program. The VA then provides this data to DOE, where it is stored in a secure site at Oak Ridge National Laboratory. This partnership provides VA researchers access to DOE's high-performance computing research facilities, like the world's fastest supercomputer, the Summit computer at Oak Ridge. It also leverages DOE's expertise in complex modeling and data analysis, which can help the VA use their data

to learn more about the causes and warning signs of various diseases.

By giving DOE access to a large-scale data base, the VA will help the Energy Department develop next-generation computing, algorithms, and modeling capability. While these tools can help the VA develop quality health care for veterans, they can also be applied to computing efforts in support of DOE's core mission programs, such as materials science, physics, or nuclear weapons research.

This legislation will leverage DOE's world-leading computing capability to provide the VA with data analysis to improve veterans' quality of life.

Mr. Norman's bill also authorizes a 2-year, crosscutting research pilot program to advance research in artificial intelligence, data analytics, and computational research. This pilot program supports DOE's efforts to improve the analysis and interpretation of big-data challenges to meet the nuclear security, energy, and science mission goals of the Department. It will facilitate more collaborations like DOE's work with the VA, giving Federal agencies, academia, and industry the chance to benefit from the Department's expertise.

I thank the bill's sponsors for bringing this important legislation before us today.

And finally, we are postponing action on the other bill noticed for this morning to address jurisdictional concerns.

PREPARED STATEMENT OF CHAIRMAN SMITH

Today we will consider H.R. 6398, the *Department of Energy Veterans' Health Initiative Act*, introduced by Energy Subcommittee member Ralph Norman, and cosponsored by joint Veterans Affairs and Science Committee members Neal Dunn and Clay Higgins, as well as 12 other Science Committee members.

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While these tools can help the VA develop quality healthcare for veterans, they can also be applied to computing efforts in support of DOE's core mission programs, such as materials science, physics or nuclear weapons research.

This legislation will leverage DOE's world-leading computing capability to provide the VA with data analysis to improve veterans' quality of life.

Mr. Norman's bill also authorizes a two-year, cross-cutting research pilot program to advance research in artificial intelligence, data analytics and computational research. This pilot program supports DOE's efforts to improve the analysis and interpretation of big data challenges to meet the nuclear security, energy and science mission goals of the Department.

It will facilitate more collaborations like DOE's work with the VA, giving federal agencies, academia and industry the chance to benefit from the Department's expertise. I thank the bill's sponsors for bringing this important legislation before us today.

Finally, we are postponing action on the other bill noticed for this morning to address jurisdictional matters related to the bill. We plan to take action on the bill in the near future.

Chairman SMITH. With that, I'll yield to the Ranking Member, the gentlewoman from Texas, Ms. Johnson, for her opening statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman. And good morning to everyone.

Today, we are marking up the *Department of Energy's Veterans' Health Initiative Act*. This bill codifies actions that were proposed in the last budget request. The bill authorizes the Department of Energy or DOE to conduct collaborative research with Department of Veterans Affairs in order to address complex, large data-management challenges associated with veterans' healthcare issues.

This bill also directs DOE to carry out a 2-year research pilot program to advance research in artificial intelligence and data analytics for a broad range of potential applications. These are both worthy ideas, and I support both of these activities. For that reason, I will not oppose the passage of this bill today. However, I think these worthy activities could have been better addressed by our Committee if we had been a little bit more thoughtful in drafting this legislation.

When this bill was noticed for markup last Friday, the bill had still not been vetted by the VA or the Veterans' Affairs Committee. Given that the bill is about veterans' affairs, that seems like a pretty big oversight.

We're going to consider the manager's amendment to address some of the concerns that we have heard from them, and I understand that the VA has expressed concern about the bill in general. Perhaps if we really wanted to help the veterans at the heart of this bill, we should have legislated with a little bit more care because passing this bill out of Committee today doesn't accomplish anything if the bill ends up dying in the Veterans' Affairs Committee.

I would note that this bill has already been referred to the Veterans' Affairs Committee, so I think it is vitally important that we work collaboratively with them on this legislation as we move forward.

Thank you, and I yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith, and good morning to everyone. Today we are marking up the *Department of Energy Veterans' Health Initiative Act*. This bill codifies actions that were proposed in the last budget request. The bill authorizes the Department of Energy (DOE) to conduct collaborative research with the Department of Veterans Affairs (VA) in order to address complex, large data management challenges associated with veterans' health care issues.

This bill also directs DOE to carry out a two-year research pilot program to advance research in artificial intelligence and data analytics for a broad range of potential applications. These are both worthy ideas, and I support both of these activities. For that reason, I will not oppose passage of this bill today. However, I think these worthy activities could have been better addressed by our Committee if we had been a little more thoughtful in drafting this legislation. When this bill was noticed for markup last Friday, the bill had still not been vetted by the VA or the Veterans Affairs Committee. Given that the bill is about veterans affairs, that seems like a big oversight. We are going to consider a Manager's Amendment to address some of the concerns that we've now heard from them, but I understand that the VA has expressed concern about the bill in general.

Perhaps if we really wanted to help the veterans at the heart of this bill, we should have legislated with a little more care, because passing this bill out of Committee today doesn't accomplish anything if the bill ends up dying at the Veterans Affairs Committee. I would note that this bill has already been referred to the Veterans Affairs Committee. So I think it is vitally important that we work collaboratively with them on this legislation as we move forward.

I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

Pursuant to notice, I now call up H.R. 6398, the *Department of Energy Veterans' Health Initiative Act*, and the clerk will report the bill.

The CLERK. H.R. 6398, a bill to authorize the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to improve healthcare services for veterans in the United States and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point. And I'll recognize myself briefly to comment on the legislation.

H.R. 6398 maximizes the impact of Department of Energy resources, research, and expertise, and ensures that the Department of Veterans Affairs can provide the best possible care to our veterans.

I look forward to hearing from the bill's sponsors and encourage my colleagues to support this bill.

I now recognize the bill's sponsor, the gentleman from South Carolina, Mr. Norman, to speak on the legislation.

Mr. NORMAN. Thank you, Chairman Smith and Ranking Member Johnson.

I got an excited call this morning from a military vet who—and I didn't realize this, but Marcus Latrell, the lone survivor whose publicized brother is a vital part of this action that we've decided to take today, which adds more emphasis to it.

My bill—as has been said, my bill authorizes partnership between DOE and the Department of Veterans Affairs to advance research focused on artificial intelligence, big-data science, and the high-priority health care needs of the Veterans Administration.

Because of the millions of veterans that have received care over time, the VA hosts one of the world's largest and most valuable health and genomic data repositories. In order to learn from this data and provide better health care for veterans, the VA needs access to more advanced computing capabilities, expertise, and infrastructure than is currently available within the agency.

DOE is a world leader in high-performance computing and is well-suited to meet this need. With its national laboratory system, DOE has a unique set of cutting-edge research capabilities like six of the world's ten fastest computers, which were designed to solve a variety of complex big-data challenges in the physical sciences.

The interagency partnership authorizes in my bill combines DOE's big-data science expertise with VA clinical and population science expertise in order to solve critical healthcare challenges for veterans, while promising to advance big-data science tools for American researchers.

This partnership, called the Million Veterans Program-Computational Health Analytics for Medical Precision to Improve Outcomes Now or MVP-CHAMPION—the most valuable champion program—

will use DOE supercomputers to analyze VA health data, looking for patterns and symptoms to improve treatment for heart disease, traumatic brain injury, and cancer.

The bill also requires the Department to establish data enclaves to securely store and transmit data provided by the VA, making sure privacy and security are maintained for veterans involved in this program.

In addition, this legislation establishes a pilot program within DOE to implement a crosscutting research initiative in artificial intelligence, data analytics, and computational research. This program will help DOE scientists gain fundamental knowledge and improved understanding of big-data analytics tools in order to address big-data challenges. These tools will both help improve the existing DOE-VA partnership and will advance DOE mission goals in nuclear security, energy technology development, and innovative science research.

Ultimately, the goal of this legislation is for the DOE national laboratories to provide the VA with information it can use to improve healthcare services for veterans. The access to the breadth, depth, and complexity of the VA dataset will also advance the next generation of data science tools.

The *DOE Veterans' Health Initiative Act* promises to improve veterans' health care and advance DOE capabilities in computer science. Our veterans should have access to better healthcare services, and our scientists should remain on the cutting edge of big-data analytics and advanced computing.

Once again, I would like to thank Chairman Smith and the other Science Committee Members who cosponsored this legislation for supporting my bill. I encourage my colleagues to support this bill, and I yield back the balance of my time.

PREPARED STATEMENT OF MR. NORMAN

Thank you, Chairman Smith, for the opportunity to speak on behalf of my bill, H.R. 6398, the *Department of Energy Veterans' Health Initiative Act*.

My bill authorizes partnership between the Department of Energy (DOE) and the Department of Veterans Affairs (VA) to advance research focused on artificial intelligence, big data science and the high priority health care needs of the VA.

Because of the millions of veterans that have received care overtime, the VA hosts one of the world's largest and most valuable health and genomic data repositories.

In order to learn from this data and provide better health care for veterans, the VA needs access to more advanced computing capabilities, expertise and infrastructure than is currently available in the agency.

DOE is a world leader in high performance computing, and is well suited to meet this need. With its national laboratory system, DOE has a unique set of cutting-edge research capabilities-like six of the world's ten fastest supercomputers-designed to solve a variety of complex big data challenges in the physical sciences.

The interagency partnership authorized in my bill combines DOE's big data science expertise with VA clinical and population science expertise in order to solve critical health challenges for veterans, while promising to advance big data science tools for American researchers.

This partnership-called the Million Veterans Program-Computational Health Analytics for Medical Precision to Improve Outcomes Now or MVP-CHAMPION program-will use DOE supercomputers to analyze VA health data, looking for patterns and symptoms to improve treatment for heart disease, traumatic brain injury and cancer.

The bill also requires the Department to establish data enclaves to securely store and transmit data provided by the VA, making sure privacy and security are maintained for veterans involved in the program.

In addition, this legislation establishes a pilot program within DOE to implement a crosscutting research initiative in artificial intelligence, data analytics and computational research.

This program will help DOE scientists gain fundamental knowledge and improved understanding of big data analytics tools in order to address big data challenges.

These tools will both help improve the existing DOE-VA partnership, and will advance DOE mission goals in nuclear security, energy technology development and innovative science research.

Ultimately, the goal of this legislation is for the DOE national laboratories to provide the VA with information it can use to improve health care services for veterans. The access to the breadth, depth and complexity of the VA dataset will also advance the next generation of data science tools.

The *Department of Energy Veterans' Health Initiative Act* promises to improve veterans' health care and advance DOE capabilities in computer science.

Our veterans should have access to better health care services and our scientists should remain on the cutting edge of big data analytics and advanced computing.

Once again, I would like to thank Chairman Smith and the 13 other Science Committee members who cosponsored this legislation for supporting my bill. I encourage my colleagues to support this bill, and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Norman.

I understand the gentleman from California, Mr. Takano, has a comment on the bill, and he's recognized for that purpose.

Mr. TAKANO. Thank you, Chairman Smith and Ranking Member Johnson. I move to strike the last word.

I want to express my concerns for how this bill has been handled. I support the aims of the bill, and I think everyone here agrees that leveraging technology to improve the health of veterans is a good thing. However, the VA and the Department of Energy already have a reimbursement agreement in place to do this work. And Veterans' Affairs Committee staff have informed me that this bill might actually make it more difficult for the two departments to continue this work.

Now, I'm encouraged the manager's amendment seeks to address the VA's concerns, but in the future we need to be engaging agencies sooner and all the stakeholders involved sooner. While I think we should be devoting more resources for veterans' health care and research, it is essential that we spend the money effectively.

I know the VA has expressed concerns about how they would spend the money in this bill and the program's duplicative nature. Just yesterday, I presided over a hearing in Veterans' Affairs Committee where Federal employee representatives told us VA is struggling to find and retain high-quality staff. Now, when we write legislation that affects multiple agencies like this, it is important that we take time to consult all the stakeholders.

I'm very proud of the bipartisan manner in which we often work when it comes to veterans' issues, as many of my colleagues here know who serve on both Committees of jurisdiction. In the future, and as we move forward on this bill, I hope we can work together to make sure we get this right.

Thank you, and I yield back.

Chairman SMITH. Thank you, Mr. Takano.

We will now go to amendments, and the only amendment I'm aware of I believe will be offered by the gentleman from Florida, Mr. Dunn, and he's recognized for that purpose.

Mr. DUNN. Mr. Chairman, I have an amendment at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment to H.R. 6398, offered by Mr. Dunn of Florida, amendment number 01. Page 5, line 13, insert an order to carry out a reimbursable agreement after memorandum of understanding. Page 6, line 11, strike section 4 and all that follows through 2020 and line 12 and insert the following: "section during fiscal years 2019 through 2013."

Chairman SMITH. And without objection, the amendment is considered as read and the gentleman is recognized to explain his amendment.

Mr. DUNN. Thank you, Mr. Chairman, for the opportunity to introduce my amendment. This straightforward amendment makes technical changes requested by the Department of Veterans Affairs. My amendment reflects how the VA manages the research program authorized in the bill, and it includes language to ensure the appropriate structure for interagency cooperation between the VA and the Department of Energy.

As the Chairman of the Subcommittee on Health on Veterans Affairs, a Member of this Committee, Science, Space, and Technology, and as a veteran myself, I'm happy to be an original cosponsor of Mr. Norman's legislation. The collaborative research authorized in this bill provides the VA researchers access to the Department of Energy's high-performance computing systems, systems capable of making over 200,000 trillion calculations per second. That's properly 200 quintillion calculations per second. In turn, the Department of Energy receives an access to a massive treasure trove of rich, contextualized data from the Veterans Administration.

VA patients have volunteered for many years genomic and healthcare data that the Department of Energy transferred to a secure data site in Oak Ridge. Part of the data includes the most detailed DNA sequencing, allowing for high-quality genomic research. With a rich and expansive dataset, the VA's Million Veterans Program provides an incredible opportunity to use DOE's next-generation quantum computing capabilities to study and solve complex healthcare problems, problems that were previously beyond our reach.

My colleagues on this Committee and I first heard about this DOE-VA research partnership during a tour of Argonne National Laboratories in May. Not only were DOE researchers excited to develop new methods to help our veterans, but the DOE and the VA have potential to solve healthcare problems for all Americans by applying these analytical methods, models, and whatnot that are developed through this program.

I'm pleased that the Science Committee has worked so hard and so closely with the House Veterans' Affairs Committee in developing my amendment, which addresses the VA's technical changes and recommendations to improve this bill. I look forward to our continued collaboration on H.R. 6398 and hopefully many other similar projects in the future.

I want to thank Representative Ralph Norman and Chairman Lamar Smith and all of my Science Committee colleagues for their leadership and support of this important and exciting legislation. I encourage all of my colleagues to support this amendment, and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Dunn.

And the Ranking Member, the gentlewoman from Texas, is recognized for her comments.

Ms. JOHNSON. Thank you very much, Mr. Chairman. I move to strike the last word.

I support the adoption of this amendment. It addresses some of the concerns that we've heard from the VA and it makes the bill a better bill. However, as I noted in my opening statement, it would have made more sense to have consulted with the VA and the Veterans' Affairs Committee prior to announcing the markup. Then we probably wouldn't have needed this amendment, and more importantly, the bill would face such an—would not be facing such an uncertain future.

I thank you and yield back.

Chairman SMITH. Thank you, Ms. Johnson.

Is there any further discussion on the amendment?

If not, the question is on agreeing to the amendment offered by Mr. Dunn.

All in favor, say aye.

Opposed no.

The ayes have it, and the amendment is agreed to.

If there are no further amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 6398 to the House, as amended, with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 6398 to the House, as amended.

All those in favor, say aye.

Opposed, nay.

The ayes have it, and the bill is ordered reported favorably.

Without objection, the motion to reconsider is laid upon the table. H.R. 6398 is ordered reported to the House.

I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

And the gentlewoman from Texas seeks recognition.

Ms. JOHNSON. Mr. Chairman, I simply want to welcome our new Member, Mr. Cloud——

Chairman SMITH. No, no, wait a minute. Wait a minute.

Ms. JOHNSON. Oh, I'm sorry.

Chairman SMITH. I'm just getting ready to do that.

Ms. JOHNSON. OK.

Chairman SMITH. You can't——

Ms. JOHNSON. I'll wait.

Chairman SMITH. You—I—you can't get ahead of me on this.

And—you weren't looking at my notes or you would have seen——

Ms. JOHNSON. No, I didn't.

Chairman SMITH [continuing]. He was up next.

Ms. JOHNSON. I should have been looking over there.

Chairman SMITH. OK. And I would like to welcome and obviously recognize the newest Member of the Science Committee, the gentleman from Texas' 27th District, Michael Cloud. Michael, welcome.

There is absolutely no truth whatsoever to the rumor that we are stacking the Committee with Texans, but it just so happens this is

the newest Member. And we had a great position for him. His Subcommittees will be announced shortly.

Michael, thanks.

OK. If there's no further discussion, that completes our business. This concludes the Science Committee markup. Without objection, the Committee stands adjourned. Thank you all.

[Whereupon, at 10:23 a.m., the Committee was adjourned.]

Appendix:

H.R. 6398, Amendment Roster

.....
(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To authorize the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to improve healthcare services for veterans in the United States, and for other purpose.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To authorize the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to improve healthcare services for veterans in the United States, and for other purpose.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Department of Energy Veterans' Health Initiative Act".

SEC. 2. DEFINITIONS.

In this Act:

1 (1) DEPARTMENT.—The term "Department"
2 means the Department of Energy.
3 (2) NATIONAL LABORATORY.—The term "Na-
4 tional Laboratory" has the meaning given that term
5 in section 2 of the Energy Policy Act of 2005 (42
6 U.S.C. 15801).
7 (3) SECRETARY.—The term "Secretary" means
8 the Secretary of Energy.

9 **SEC. 3. PURPOSES.**

10 The purposes of this Act are to advance Department
11 of Energy expertise in artificial intelligence and high per-
12 formance computing in order to improve health outcomes
13 for veteran populations by—
14 (1) supporting basic research through the appli-
15 cation of artificial intelligence, high performance
16 computing, modeling and simulation, machine learn-
17 ing, and large scale data analytics to identify and
18 solve outcome-defined challenges in the health
19 sciences;
20 (2) maximizing the impact of health and
21 genomics data provided by the Department of Vet-
22 erans Affairs, as well as other sources, on science,
23 innovation, and health care outcomes through the
24 use and advancement of artificial intelligence and

1 high-performance computing capabilities of the De-
2 partment of Energy;
3 (3) promoting collaborative research through
4 the establishment of partnerships to improve data
5 sharing between Federal agencies, National Labora-
6 tories, institutions of higher education, and non-
7 profit institutions;
8 (4) establishing multiple scientific computing
9 user facilities to house and provision available data
10 to foster transformational outcomes; and
11 (5) driving the development of technology to im-
12 prove artificial intelligence, high performance com-
13 puting, and networking relevant to mission applica-
14 tions of the Department of Energy, including mod-
15 eling, simulation, machine learning, and advanced
16 data analytics.

17 **SEC. 4. DEPARTMENT OF ENERGY VETERANS HEALTH RE-**
18 **SEARCH AND DEVELOPMENT.**

19 (a) IN GENERAL.—The Secretary shall establish and
20 carry out a research program in artificial intelligence and
21 high performance computing, focused on the development
22 of tools to solve big data challenges associated with vet-
23 eran's healthcare, and to support the efforts of the De-
24 partment of Veterans Affairs to identify potential health
25 risks and challenges utilizing data on long term

1 healthcare, health risks, and genomic data collected from
2 veteran populations. The Secretary shall carry out this
3 program through a competitive, merit-reviewed process,
4 and consider applications from National Laboratories, in-
5 stitutions of higher education, multi-institutional collabo-
6 rations, and other appropriate entities.

7 (b) PROGRAM COMPONENTS.—In carrying out the
8 program established under subsection (a), the Secretary
9 may—

10 (1) conduct basic research in modeling and sim-
11 ulation, machine learning, large scale data analytics,
12 and predictive analysis in order to develop novel or
13 optimized algorithms for prediction of disease treat-
14 ment and recovery;

15 (2) develop methods to accommodate large data
16 sets with variable quality and scale, and to provide
17 insight and models for complex systems;

18 (3) develop new approaches and maximize the
19 use of algorithms developed through artificial intel-
20 ligence, machine learning, data analytics, natural
21 language processing, modeling and simulation, and
22 develop new algorithms suitable for high perform-
23 ance computing systems and large biomedical data
24 sets;

1 (4) advance existing and construct new data en-
2 claves capable of securely storing data sets provided
3 by the Department of Veterans Affairs, Department
4 of Defense, and other sources; and
5 (5) promote collaboration and data sharing be-
6 tween National Laboratories, research entities, and
7 user facilities of the Department by providing the
8 necessary access and secure data transfer capabili-
9 ties.
10 (c) COORDINATION.—In carrying out the program re-
11 quired under subsection (a), the Secretary is authorized
12 to—
13 (1) enter into a memorandum of understanding
14 with the Department of Veterans Affairs and other
15 entities in order to maximize the effectiveness of De-
16 partment of Energy research and development to im-
17 prove veterans' healthcare; and
18 (2) consult with the Department of Veterans
19 Affairs and other Federal agencies as appropriate.
20 (d) REPORT.—Not later than two years after the date
21 of the enactment of this Act, the Secretary shall submit
22 to the Committee on Science, Space, and Technology and
23 the Committee on Veterans' Affairs of the House of Rep-
24 resentatives, and the Committee on Energy and Natural

1 Resources and the Committee on Veterans' Affairs of the
2 Senate, a report detailing the effectiveness of—
3 (1) the interagency coordination between each
4 Federal agency involved in the research program
5 carried out under this section;
6 (2) collaborative research achievements of the
7 program; and
8 (3) potential opportunities to expand the tech-
9 nical capabilities of the Department.
10 (e) FUNDING.—The Secretary of Veterans Affairs
11 shall devote $27,000,000 to carry out this section for fis-
12 cal years 2019 and 2020, subject to the availability of ap-
13 propriations, to come from amounts made available for
14 medical and prosthetic research. This section shall be car-
15 ried out using funds otherwise appropriated by law after
16 the date of enactment of this Act.

17 **SEC. 5. ARTIFICIAL INTELLIGENCE, DATA ANALYTICS, AND**
18 **COMPUTATIONAL RESEARCH PILOT PRO-**
19 **GRAM.**

20 (a) IN GENERAL.—The Secretary shall carry out a
21 pilot program to develop tools for big data analytics by
22 utilizing data sets generated by Federal agencies, institu-
23 tions of higher education, nonprofit research organiza-
24 tions, and industry in order to advance artificial intel-
25 ligence technologies to solve complex, big data challenges.

1 The Secretary shall carry out this program through a com-
2 petitive, merit-reviewed process, and consider applications
3 from National Laboratories, institutions of higher edu-
4 cation, multi-institutional collaborations, and other appro-
5 priate entities.

6 (b) PROGRAM COMPONENTS.—In carrying out the
7 pilot program established under subsection (a), the Sec-
8 retary may—

9 (1) establish a cross-cutting research initiative
10 to prevent duplication and coordinate research ef-
11 forts in artificial intelligence and data analytics
12 across the Department;

13 (2) conduct basic research in modeling and sim-
14 ulation, artificial intelligence, machine learning,
15 large scale data analytics, natural language proc-
16 essing, and predictive analysis in order to develop
17 novel or optimized predictive algorithms suitable for
18 high performance computing systems and large bio-
19 medical data sets;

20 (3) develop multivariate optimization models to
21 accommodate large data sets with variable quality
22 and scale in order to visualize complex systems;

23 (4) establish multiple scientific computing user
24 facilities to serve as data enclaves capable of se-
25 curely storing data sets created by Federal agencies,

1 institutions of higher education, nonprofit organiza-
2 tions, or industry at National Laboratories; and
3 (5) promote collaboration and data sharing be-
4 tween National Laboratories, research entities, and
5 user facilities of the Department by providing the
6 necessary access and secure data transfer capabili-
7 ties.
8 (c) REPORT.—Not later than two years after the date
9 of the enactment of this Act, the Secretary shall submit
10 to the Committee on Science, Space, and Technology of
11 the House of Representatives and the Committee on En-
12 ergy and Natural Resources of the Senate a report evalu-
13 ating the effectiveness of the pilot program under sub-
14 section (a), including basic research discoveries achieved
15 in the course of the program and potential opportunities
16 to expand the technical capabilities of the Department
17 through the development of artificial intelligence and data
18 analytics technologies.
19 (d) FUNDING.—For purposes of carrying out this
20 section, the Secretary of Energy shall devote $52,000,000
21 to carry out this section, which shall include $26,000,000
22 for each fiscal years 2019 and 2020, subject to the avail-
23 ability of appropriations. This section shall be carried out
24 using funds otherwise appropriated by law after the date
25 of enactment of this Act.

1 **SEC. 6. SPENDING LIMITATION.**

2 No additional funds are authorized to be appro-
3 priated to carry out this Act and the amendments made
4 by this Act, and this Act and such amendments shall be
5 carried out using amounts otherwise available for such
6 purpose.

AMENDMENT TO H.R. _____

OFFERED BY M__. _____

[Page and line numbers refer to version of DOE_VETS posted to Science, Space, and Technology committee website dated July 13, 2018 with a timestamp of 1:55PM.]

Page 5, line 13, insert "in order to carry out a reimbursable agreement" after "memorandum of understanding".

Page 6, line 11, strike "section for" and all that follows through "2020" on line 12 and insert the following: "section during fiscal years 2019 through 2023".

PROCEEDINGS OF THE FULL COMMITTEE MARKUPS: S. 141, SPACE WEATHER RESEARCH AND FORECASTING ACT; AND H.R. 6468, IMPROVING SCIENCE IN CHEMICAL ASSESSMENTS ACT

TUESDAY, JULY 24, 2018

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 2:55 p.m., in room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order. Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Pursuant to Committee rule 2(e) and House rule XI(2)(h)(4), the Committee announces that he may postpone roll call votes.

Today, we meet to consider S. 141, the *Space Weather Research and Forecasting Act*; and H.R. 6468, the *Improving Science in Chemical Assessments Act*. And I'll recognize myself for an opening statement.

Today, we meet to consider two bills primarily referred to the Science Committee. One is S. 141, the *Space Weather Research and Forecasting Act*. The Committee will consider an amendment in the nature of a substitute by Representative Perlmutter as base text. The Perlmutter-Brooks substitute requires the establishment of roles and responsibilities for Federal agencies within the Nation's space weather enterprise. It codifies a formal approach to assessing and addressing the challenges posed by space weather in the areas of observation, forecasting, and response.

Broadly speaking, space weather is the way the behavior of the sun and the nature of the Earth's magnetic field and atmosphere interact. Space weather can affect the modern technology we rely upon daily.

The electric grid, oil pipelines, passengers on commercial airlines, and satellites that provide telecommunications and GPS services can all be impacted by space weather. Depending on the severity of the event, these impacts can prove disastrous. As with terrestrial weather, without thorough monitoring and accurate modeling, we simply have no good way to predict space weather events and,

in turn, no ability to ensure that life and property are protected if severe events occur.

While the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, and the U.S. Air Force currently monitor space weather, issue forecasts, and create other products to inform the public, space weather science, as a discipline, is still in its early stages. Without marked improvements in understanding the causes of space weather led by NASA and the ability to more accurately forecast and predict events, much of our modern technological infrastructure is at risk.

The Perlmutter-Brooks substitute creates, for the first time, a formal national framework to leverage the capabilities and expertise of the government, commercial sector, academic community, and international partners. By tasking the National Space Council with overseeing this framework, this amendment sets out a strategy that is consistent with the current Administration's approach to the management of space issues and raises the profile of space weather and the serious threat it poses.

Additionally, this amendment codifies the reality of the threat posed by space weather and requires the establishment and maintenance of a baseline capability for space weather observation and forecasting.

However, through the creation of a pilot program for the purchase of space weather data and services from the commercial sector, the substitute also ensures that innovative, cost-effective strategies can be pursued. And our burgeoning commercial space industry can help address the challenges posed by space weather. The Perlmutter-Brooks amendment will help us better prepare for, respond to, and recover from potential space weather events.

The other is H.R. 6468, the *Improving Science in Chemical Assessments Act*, introduced by Environment Subcommittee Chairman Andy Biggs, and cosponsored by Committee Vice Chairman Lucas, Environment Subcommittee Vice Chairman Norman, and Representatives Rohrabacher, Posey, Weber, Babin, Higgins, Lesko, Hultgren, Abraham, Webster, Marshall, and Dunn.

This legislation amends the *Environmental Research, Development, and Demonstration Act* to require any chemical hazard identification and dose response assessments previously conducted by the Integrated Risk Information System, or IRIS program, to be carried out by the relevant national program offices within the EPA.

Since 2009, the Government Accountability Office and the National Academy of Sciences have raised multiple reports criticizing the IRIS program for a lack of transparency, procedural flaws, and improper science. This Committee held a hearing last September examining many of these problems and learning more about their impact on industry. Committee staff have held two briefings with the EPA to learn more about the practices and procedures of the IRIS program.

Although much work has been done in recent years to address shortcomings in the program, the results just aren't there. The time is ripe for an overhaul to bring the chemical assessment process at EPA back to its core mission of conducting complete and transparent scientific research as the foundation for regulatory de-

cisions. This bill does just that by making agency science more useful to EPA program offices while increasing transparency and efficiency in the conduct of chemical assessments.

H.R. 6468 requires the EPA to follow strict scientific standards in conducting hazard identification and dose response assessments. The bill requires the EPA to ensure the underlying scientific data is complete, relevant, and reproducible. It also explicitly requires the EPA to integrate all lines of scientific evidence, a suggestion made by the National Academies of Sciences in 2014.

The EPA Office of Research and Development must certify that each chemical assessment completed by the relevant program offices meets the scientific standards in the legislation. Together, these improvements will increase the public's confidence in the EPA's chemical toxicity assessments by ensuring they are conducted using the best available science and are based on the weight of the evidence.

Taken together, the two bills we consider today prioritize key programs and vital reforms within the Science Committee's jurisdiction, though I should mention that the second bill also has joint jurisdiction with the Energy Committee, as John Shimkus just reminded me on the House floor a few minutes ago.

PREPARED STATEMENT OF CHAIRMAN SMITH

Today we meet to consider two bills primarily referred to the Science Committee.

One is S. 141, the *Space Weather Research and Forecasting Act*. The committee will consider an amendment in the nature of a substitute by Rep. Perlmutter as base text.

The Perlmutter-Brooks substitute requires the establishment of roles and responsibilities for federal agencies within the nation's space weather enterprise. It codifies a formal approach to assessing and addressing the challenges posed by space weather in the areas of observation, forecasting, and response.

Broadly speaking, space weather is the way the behavior of the sun and the nature of the Earth's magnetic field and atmosphere interact. Space weather can affect the modern technology we rely upon daily.

The electric grid, oil pipelines, passengers on commercial airlines, and satellites that provide telecommunications and GPS services can all be impacted by space weather. Depending on the severity of the event, these impacts can prove disastrous. As with terrestrial weather, without thorough monitoring and accurate modeling, we simply have no good way to predict space weather events and, in turn, no ability to ensure that life and property are protected if severe events occur.

While the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), and the U.S. Air Force currently monitor space weather, issue forecasts, and create other products to inform the public, space weather science, as a discipline, is in its early stages.

Without marked improvements in understanding the causes of space weather, led by NASA, and the ability to more accurately forecast and predict events, much of our modern technological infrastructure is at risk.

The Perlmutter-Brooks substitute creates, for the first time, a formal national framework to leverage the capabilities and expertise of the government, commercial sector, academic community, and international partners.

By tasking the National Space Council with overseeing this framework, this amendment sets out a strategy that is consistent with the current Administration's approach to the management of space issues, and raises the profile of space weather and the serious threat it poses.

Additionally, this amendment codifies the reality of the threat posed by space weather and requires the establishment and maintenance of a baseline capability for space weather observation and forecasting.

However, through the creation of a pilot program for the purchase of space weather data and services from the commercial sector, the substitute also ensures that innovative, cost-effective strategies can be pursued. And our burgeoning commercial space industry can help address the challenges posed by space weather.

The Perlmutter-Brooks amendment will help us better prepare for, respond to, and recover from potential space weather events.

The other is H.R. 6468, the *Improving Science in Chemical Assessments Act*, introduced by Environment Subcommittee Chairman Andy Biggs, and co-sponsored by Committee Vice Chairman Lucas, Environment Subcommittee Vice Chairman Norman, and Representatives Rohrabacher, Posey, Weber, Babin, Higgins, Lesko, Hultgren, Abraham, Webster, Marshall, and Dunn.

This legislation amends the *Environmental Research, Development, and Demonstration Act* to require any chemical hazard identification and dose response assessments previously conducted by the Integrated Risk Information System, or "IRIS" program, to be carried out by the relevant national program offices within the EPA.

Since 2009, the Government Accountability Office and the National Academy of Sciences have issued multiple reports criticizing the IRIS program for a lack of transparency, procedural flaws, and improper science.

This committee held a hearing last September examining many of these problems and learning more about their impact on industry. Committee staff have held two briefings with the EPA to learn more about the practices and procedures of the IRIS program.

Although much work has been done in recent years to address shortcomings in the program, the results just aren't there. The time is ripe for an overhaul to bring the chemical assessment process at EPA back to its core mission of conducting complete and transparent scientific research as the foundation for regulatory decisions. This bill does just that by making agency science more useful to EPA program offices while increasing transparency and efficiency in the conduct of chemical assessments.

H.R. 6468 requires the EPA to follow strict scientific standards in conducting hazard identification and dose response assessments. The bill requires the EPA to ensure the underlying scientific data is complete, relevant, and reproducible. It also explicitly requires the EPA to integrate all lines of scientific evidence, a suggestion made by the National Academies of Sciences in 2014.

The EPA Office of Research and Development must certify that each chemical assessment completed by the relevant program offices meets the scientific standards in the legislation.

Together, these improvements will increase the public's confidence in the EPA's chemical toxicity assessments by ensuring they are conducted using the best available science and are based on the weight of the evidence.

Taken together, the two bills we consider today prioritize key programs and vital reforms within the Science Committee's jurisdiction.

Chairman SMITH. I will now recognize the gentlewoman from Texas, the Ranking Member, for her opening statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman, and good afternoon to everyone.

Today, we are marking up two bills, the *Space Weather Research and Forecasting Act* and the *Improving Science in Chemical Assessments Act*. Before I speak on the specifics of the bills, I again want to take a moment to comment on the Committee's dramatic turnaway from regular order.

This markup was noticed on Friday afternoon when we left on Thursday, well after most Members were out of town. Moreover, since the markup is on a Tuesday, the amendment deadline was 2 p.m. on Monday, which is before most Members are back in Washington. This hardly seems conducive to a Member participation in a markup.

Then, on Saturday afternoon, another bill was added to the markup. This may be the least amount of notice I've ever received on a bill being marked up in the Science Committee. In fact, until last Congress, this would have broken the longstanding Committee notice requirements. However, Chairman Smith changed the rules to allow weekend days to count toward the notice requirements.

On top of these issues, our Committee rarely holds legislative hearings, and we haven't held a Subcommittee markup in years.

Bills are concocted in secret and thrown at the Committee Members with no real chance for meaningful review. The result is that Members are disenfranchised, and the work of this Committee suffers. We can do better than this.

The first bill up in the—is the *Space Weather Research and Forecasting Act*. I will speak more about this in a minute when we consider it. However, I want to note how ridiculous it is to jam the Members of this Committee by noticing this bill over the weekend.

The bill we are marking up, S. 141, was introduced in January 2017. It was referred to our Committee in May 2017, which is well over a year ago. Mr. Perlmutter's companion bill was introduced in June 2017. We could have considered these bills at any point in the past year instead of jamming the Members of this Committee with the late markup notice.

This bill has been referred to four additional House Committees, so I suspect it is going nowhere in a hurry. In fact, it seems like this entire markup is a complete waste of our Members' time.

The next bill we're marking up is a good example of the silliness that ensues when the Committee engages in these half-baked markups. We were supposed to mark this bill up last week. However, the majority had to pull the bill when it wasn't even referred to our Committee, so here we are again.

The bill appears to have been hastily drafted in secret without getting any feedback from the affected agencies or the affected community. On top of being sloppily drafted and poorly vetted, this bill is just plain bad. The bill would remove chemical assessments from EPA's IRIS program and shift them to the separate program offices within the agency. Essentially, it is shutting down IRIS without explicitly saying so. The end results, perhaps surprisingly, is that the chemical assessments will be delayed and of worse quality than under the IRIS program. Ultimately, though, my greatest concern is the harm that will come to the Americans if this chemical assessments are undermined.

That is why the bill is opposed by the Union of Concerned Scientists, the Natural Resources Defense Council, and the Environmental Defense Fund. They've written letters to the Committee expressing their opposition, and I ask that they may be made part of the record.

Union of Concerned Scientists
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1825 K Street NW, Suite 800, Washington, DC 20006-1232 t 202.223.6133 f 202.223.6162
2397 Shattuck Avenue, Suite 203, Berkeley, CA 94704-1567 t 510.843.1872 f 510.843.3785
One North LaSalle Street, Suite 1904, Chicago, IL 60602-4064 t 312.578.1750 f 312.578.1751

July 17, 2018

The Honorable Lamar Smith
Chair, House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Eddie Bernice Johnson
Ranking Member, House Committee on Science, Space, and Technology
394 Ford House Office Building
Washington, D.C. 20515

Dear Chairman Smith and Ranking Member Johnson:

The Union of Concerned Scientists, with more than 500,000 members and supporters throughout the country, strongly opposes proposed legislation to alter the chemical assessment process at the Environmental Protection Agency (EPA).

As drafted, the misleadingly named "Chemical Assessment Improvement Act" would eviscerate EPA's Integrated Risk Information System (IRIS) program, which conducts important risk assessments that represent the gold standard for chemical toxicity reviews. By essentially gutting the IRIS program through this ill-conceived legislative proposal, the committee would guarantee an information vacuum that would make it more difficult for federal, state, local, and international agencies to promulgate robust science-based public health policies and protections.

Shifting the work of IRIS from EPA's Office of Research and Development (ORD) to the program areas within the agency would decrease the relative independence and effectiveness of the office and could result in hazard assessments that are not fully inclusive of all routes of exposure. The environmental contaminants that IRIS reviews are typically not limited to one route of exposure, so placing the burden of reviewing chemicals in one program area, regardless of whether it is the Office of Water, Office of Air and Radiation, Office of Land and Emergency Management, or Office of Chemical Safety and Pollution Prevention, would likely result in a less than comprehensive toxicity review and assessment.

Further, Section 3 of this bill would introduce opportunities for a steering committee chaired by a political appointee at EPA to decide whether to employ a third-party assessment, and to choose the author of the assessment. This would politicize what should be a completely science-based process and could result in the reliance on these

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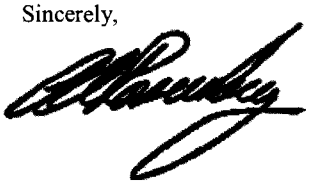
studies rather than completing rigorous in-house reviews which is what is already being done by the IRIS program. While there have been reports of political interference at IRIS,[1] this proposal would exacerbate the politicization of the chemical assessment process at EPA. The current structure of IRIS allows its scientific work to be independent of the influence of political appointees, and the program should remain that way to be the most effective.

In addition, this bill aims to play up uncertainty in the science by emphasizing the need for non-linear approaches to dose-response modeling. This has been a long-standing goal of regulated industry and would result future chemical assessments that could downplay the health effects of toxic chemicals. The legislation, if passed, would also restrict the scientific studies that EPA can include in its hazard identification and dose response assessments to those that are publicly available and able to be replicated or reproduced. The concerns we have with these provisions echo those with the EPA's Strengthening Transparency in Regulatory Science proposed rule: it would make it significantly harder for EPA to use the best available science to protect the public.[2]

EPA's IRIS program has constantly been under attack by industry and some members of Congress. However, it is a program that has been and remains vital in ensuring science-based safeguards and deserving of your support. Its work has been recently recognized and commended by two independent scientific bodies, the National Academy of Sciences[3] and the EPA Science Advisory Board.[4] UCS supports the conclusions of the National Academy of Sciences, specifically that the IRIS program's current systematic review process is both scientifically rigorous and transparent and that its current organizational structure at ORD is appropriate to maintain its independence. We urge you to reconsider this misguided legislative effort that would effectively end the IRIS program as we know it and vote no on the misguided "Chemical Assessment Improvement Act."

Sincerely,



Andrew A. Rosenberg, Ph.D.
Director, Center for Science and Democracy
Union of Concerned Scientists

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[1] https://www.politico.com/story/2018/07/06/epa-formaldehyde-warnings-blocked-696628

[2] https://blog.ucsusa.org/andrew-rosenberg/the-epa-should-not-restrict-the-science-they-use-to-protect-us

[3] https://www.nap.edu/catalog/25086/progress-toward-transforming-the-integrated-risk-information-system-iris-program

[4] https://yosemite.epa.gov/sab/sabproduct.nsf/A9A9ACCE42B6AA0E8525818E004CC597/$File/EPA-SAB-17-008.pdf

NRDC

July 17, 2018

Dear Representative,

On behalf of our millions of members and supporters, the Natural Resources Defense Council urges you to oppose the Chemical Assessment Improvement Act. Rather than improving EPA's information about toxic chemicals, this chemical industry supported bill would undermine the scope and reliability of EPA's chemical hazard assessments. It would replace the current robust, comprehensive and publicly vetted system with a fragmented and unprotective approach that will result in weaker protections from air pollution, contaminated drinking water and toxic chemicals in products.

The Chemical Assessment Improvement Act would dismantle EPA's Integrated Risk Information System (IRIS), which develops chemical hazard profiles using a credible and publicly vetted process that has earned it high praise from the Agency's Scientific Advisory Board and by the National Academies (NAS 2014; NAS 2018). Hazard is an inherent property of a chemical – that is, it doesn't change with changing context. Dynamite is explosive, asbestos causes cancer, mercury and lead are neurotoxic. This information is then paired with contextual information such as a site-specific superfund clean-up or a drinking water public health goal to generate meaningful risk estimates to protect the public.

With the IRIS assessment, regulators and others can ask many diverse questions relevant to individual EPA programs, non-regulatory programs, and even industry and non-government programs. Having a central IRIS Program to provide chemical hazard assessments to other EPA programs is thus a wise use of resources, avoids duplicating work, and most importantly – avoids incomplete or misleading assessments based on partial information or generated through a partial process. Dismantling IRIS would silo information and resources without ever completing a comprehensive chemical hazard profile, resulting in less information with which to protect the public.

The bill would take IRIS out of the EPA science office, and scatter its core functions among narrowly focused regulatory offices – exactly what the National Academies just cautioned against: "the IRIS teams involved in the systematic-review process should be independent of those involved in regulatory decision-making who use the products of the systematic-review teams. The committee notes that the current organizational structure of the IRIS program in the EPA Office of Research and Development is consistent with those best practices."(NAS, 2018)

In fact, the Office of Chemical Safety and Pollution Prevention – under the direction of a former chemical industry lobbyist -- is already proposing systematic review methods that, if adopted would put a thumb on the scale in support of disregarding chemical hazards.

NATURAL RESOURCES DEFENSE COUNCIL

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Finally, the bill requires consideration of "third party assessments" – meaning industry evaluations of its own chemical products. But requiring consideration of the chemical industry's self-assessments will not benefit EPA or the public. In fact, under President GW Bush the IRIS program did invite some third-party assessments (vinyl chloride, butadiene, styrene), and they all failed EPA review. The invitation was rescinded, and the EPA Science Advisor at the time was quoted saying that EPA staff was doing more work to try to fix the broken assessments than to generate them in the first place. " [I]t is taking staff as much or more time to work with the outside parties as it does to develop in house toxicological reviews, [Paul] Gilman said. To date, the process has not saved the time or resources it was designed to save." (Phibbs 2002; Sass et al. 2005)

Americans deserve to be safe from harmful chemicals at work and at home. To achieve this, they need complete and credible information. The Chemical Assessment Improvement Act would rob the public of this vital information, undermine independence and introduce bias against regulating toxic chemicals into a system that should be protecting Americans. The House Science Committee should be following the recommendations of the NAS, not the chemical industry. We urge you once again to oppose this bill.

Sincerely

Jennifer Sass,
Senior Scientist
Natural Resources Defense Council

July 24, 2018

The Honorable Lamar Smith
Chairman
Committee on Science, Space, and Technology
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Eddie Bernice Johnson
Ranking Member
Committee on Science, Space, and Technology
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairman Smith and Ranking Member Johnson,

Environmental Defense Fund (EDF) strongly opposes the Improving Science in Chemical Assessments Act being marked up by the full committee on July 24, 2018. This bill is an attempt to dismantle the vitally important Integrated Risk Information System (IRIS) program at the Environmental Protection Agency (EPA)—stripping away a core scientific function of the agency that serves to protect public health.

The IRIS program is a non-regulatory program within EPA's Office of Research and Development (ORD) National Center for Environmental Assessment (NCEA) that provides critical chemical hazard information to support a variety of public health decision-making needs inside and outside the agency. EPA program and regional offices as well as other federal, state, and local authorities rely on IRIS chemical human health hazard assessments, or toxicological reviews, to characterize and ultimately manage risks of toxic chemicals present in our air, water, land, and in the products we encounter in our everyday lives.

The Improving Science in Chemical Assessments Act would transfer the development of chemical toxicological reviews out of the IRIS program and into agency program offices that lack the full complement of specialized expertise provided by the scientific staff of the IRIS program and

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broader NCEA. Likewise, the bill gives no consideration to the substantial additional workload and resource drain the program offices would incur as a result.

Indeed, the bill appears to ignore key factors that motivated the inception of the IRIS program originally and that are still relevant today. These include creating efficiency in the development of chemical assessments at the agency, in part by playing a coordinating role; supporting scientific consistency in the development of chemical assessments; and providing independence between the scientific review of chemicals and regulatory decisions informed by those reviews.

With regard to efficiency, the bill would establish a "chemical hazard identification and dose response" steering committee to coordinate assessments and avoid duplication of efforts. However, the IRIS program currently provides this function from the scientifically advantageous and sensible vantage of ORD.

With regard to supporting scientific consistency, EPA's website notes, "The IRIS Program was created by EPA in 1985 to provide an internal database of human health assessments for chemicals found in the environment. The goal of the IRIS Program was to foster consistency in the evaluation of chemical toxicity across the Agency. Since then, the IRIS Program has become an important public resource as well."[1] It is worth nothing that the IRIS program is responsible for spearheading the advent of systematic review in the development of chemical assessments at EPA. Born out of the clinical sciences, systematic review employs structured approaches to evidence identification, evaluation, and synthesis in a manner that promotes scientific rigor, consistency, transparency, objectivity, and reduction of bias.[2] IRIS is a leader in the application of systematic review in environmental health, and through its assessments, IRIS is building institutional proficiency and capacity at the agency in this area.

With regard to the importance of scientific independence, EPA's website states, "The placement of the IRIS Program in ORD is intentional. It ensures that IRIS can develop impartial toxicity information independent of its use by EPA's program and regional offices to set national standards and clean up hazardous sites."[3]

This bill has a number of provisions that could result in a weakening of scientific independence and integrity in the development of chemical assessments. For instance, the bill allows third parties to submit covered chemical assessments, an opportunity that undoubtedly will be used primarily by industry, raising significant conflict of interest concerns. The bill also promotes the development of a range of toxicity values for a chemical, deviating from the current practice of single toxicity values. This provision would lead to disparate risk management decisions as different regulators could choose different toxicity values to inform their decisions. Moreover, effective use of ranges of toxicity values requires a level of expertise and expert judgment that risk managers on the ground may not have.

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[1] https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system
[2] https://ehp.niehs.nih.gov/1307175/
[3] https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system

Section 4 of the bill includes a list of scientific considerations to be used in the development of covered assessments. Many of these raise red flags. For example, sections 4(3) and 4(6) introduce the possibility that a high quality scientific study may be excluded from use in an assessment unless its underlying data are publicly available or unless the study has been repeated. Section 4(7) dictates expectations for how dose-response modeling is to be performed in a manner that is at odds with conventional, health protective approaches. These scientific considerations mirror troubling issues raised in EPA's "Strengthening Transparency in Regulatory Science" proposed rule,[4] a hugely problematic and widely criticized proposal.[5]

IRIS has received high marks from the National Academies in its most recent 2014[6] and 2018[7] reviews of the program. The program has also received praise from EPA's Scientific Advisory Board.[8] Despite this, and despite the enormous reliance on the program from all levels of government, there have been numerous attempts to dismantle IRIS by segments of industry, political leadership at EPA, and some members of Congress.

EDF has deep concerns with the bill you are marking up today, and we strongly affirm the significance of the IRIS program's work. The IRIS program serves the needs of not only program offices at EPA, but also the needs of its regional offices, other federal agencies, states, local government, and tribes. Indeed, a recent letter from the Environmental Council of States to Congress noted, "The IRIS Program's identification and characterization of chemical health hazards plays a vital role in states' efforts to protect their residents and environments against harmful toxic exposures."[9] IRIS plays a critical role in ensuring regulatory decisions are based on sound science, serving the best interests of the public. We strongly urge the committee to vote against the Improving Science in Chemical Assessments Act.

Sincerely,

Jennifer McPartland, PhD
Senior Scientist, Health Program
Environmental Defense Fund

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[4] https://www.epa.gov/osa/strengthening-transparency-regulatory-science
[5] http://blogs.edf.org/health/2018/07/17/edf-calls-on-epa-withdraw-censored-science/
[6] https://www.nap.edu/catalog/18764/review-of-epas-integrated-risk-information-system-iris-process
[7] http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=25086
[8] https://yosemite.epa.gov/sab/sabproduct.nsf/0/A9A9ACCE42B6AA0E8525818E004CC597/$File/EPA-SAB-17-008.pdf
[9] https://www.ecos.org/wp-content/uploads/2018/03/IRIS-Letter.pdf

This really is a bad bill that will ultimately result in bad science and sick people. I urge all of my colleagues to oppose it.

I thank you and yield back.

PREPARED STATEMENT OF MS. JOHNSON

Thank you, Chairman Smith, and good afternoon to everyone. Today we are marking up two bills: The *Space Weather Research and Forecasting Act* and the *Improving Science in Chemical Assessments Act*.

Before I speak on the specifics of the bills, I again want to take a moment to comment on the Committee's dramatic turn away from regular order. This markup was noticed on Friday afternoon, well after most Members had left town. Moreover, since the markup is on a Tuesday, the amendment deadline was at 2pm Monday- which is before most Members are back in Washington. This hardly seems conducive to Member participation in the markup.

Then on Saturday afternoon, another bill was added to the markup. This may be the least amount of notice I have ever received of a bill being marked up in the Science Committee. In fact, until last Congress, this would have broken the longstanding Committee notice requirements. However, Chairman Smith changed the rules to allow weekend days to count toward the notice requirements.

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The first bill up is the *Space Weather Research and Forecasting Act*. I will speak more about this in a minute when we consider it. However, I want to note how ridiculous it is to jam the Members of this Committee by noticing this bill over the weekend.

The bill we are marking up, S. 141, was introduced in January of 2017. It was referred to our Committee in May of 2017, which is well over a year ago. Mr. Perlmutter's companion bill was introduced in June of 2017. We could have considered these bills at any point in the past year instead of jamming the Members of this Committee with a late markup notice.

This bill has been referred to four additional House committees, so I suspect it is going nowhere in a hurry. In fact, it seems like this entire markup is a complete waste of our Members time. The next bill we are marking up is a good example of the silliness that ensues when the Committee engages in these half-baked markups. We were supposed to mark this bill up last week. However, the Majority had to pull the bill when it wasn't even referred to our Committee. So here we are to try again.

The bill appears to have been hastily drafted in secret, without getting any feedback from the affected agency or affected community. On top of being sloppily drafted and poorly vetted, this bill is just plain bad.

The bill would remove chemical assessments from the EPA's IRIS program and shift them to the separate program offices within the agency. Essentially, it shuts down IRIS without explicitly saying so. The end result, perhaps unsurprisingly, is that chemical assessments will be delayed and of worse quality than under the IRIS program.

Ultimately though, my greatest concern is the harm that will come to Americans if these chemical assessments are undermined. That is why the bill is opposed by the Union of Concerned Scientists, the Natural Resources Defense Council, and the Environmental Defense Fund. They have written letters to the committee expressing their opposition, and I ask that they be made a part of the record.

This is a bad bill that will ultimately result in bad science and sick people. I urge all of my colleagues to oppose it.

I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

I'll recognize myself for a minute.

I just want to give Members a complete picture about why we had a weekend notice of particularly the weather bill. Other Members can respond to the merits or demerits of the bills and the substance of the bills.

But the bill that we talked about over the weekend and I talked to Mr. Perlmutter about it at least once or twice and we exchanged other messages, I talked to Senator Peters about the space weather

bill over the weekend, and we exchanged several messages. And this was all in an effort to try to keep, frankly, a commitment I made to Mr. Perlmutter and the Senator to mark up this bill before we broke for our August recess. So we bent over backward over the weekend to make sure that we were ready for markup, and I'm a little surprised to hear the Ranking Member complain about a Democratic bill over which we put in a lot of—into which we put in a lot of effort so that we would be prepared to mark it up today. So I just want, again, Members to have a full picture of the space weather bill and why that weekend notice was necessary.

S. 141

Chairman SMITH. Pursuant to notice, I now call up S. 141, the *Space Weather Research and Forecasting Act*. And the clerk will report the bill.

The CLERK. S. 141, an act to improve understanding and forecasting of space weather events and for other purposes.

Chairman SMITH. Without objection, the bill is considered as read and open for amendment at any point. And we will now proceed with consideration of amendments in the order listed in the roster.

And I now recognize the gentleman from Colorado, Mr. Perlmutter, to offer an amendment in the nature of a substitute. And does the gentleman have an amendment at the desk?

Mr. PERLMUTTER. I have an amendment in the nature of a substitute to Senate Bill 141 at the desk.

Chairman SMITH. And the clerk will report the amendment.

The CLERK. Amendment in the nature of a substitute to S. 141 offered by Mr. Perlmutter of Colorado, amendment number ANS–01.

Chairman SMITH. Without objection, the amendment is considered as read and will serve as base text for purposes of amendment.

The gentleman from Colorado, Mr. Perlmutter, is recognized for 5 minutes on his amendment.

Mr. PERLMUTTER. Thank you, Mr. Chairman. And I am very pleased we're here today to finally mark up legislation on space weather. And the Ranking Member is correct. This has—this subject has been hanging around now for at least a year.

Space weather is electromagnetic activity from the sun. It's radiation, it's flares, it's eruptions, and it can have significant societal, economic, national security, and health implications both here on Earth, as well as in space.

Almost 3 years ago, Dr. Dan Baker from the University of Colorado Boulder testified in front of this Committee about the dangers of space weather events on our electrical grid. At that hearing, he said, "Had an observed July 2012 space weather event actually hit the Earth, we would still be picking up the pieces." That testimony stuck with me, and when Senators Gary Peters and Cory Gardner introduced a *Space Weather Research and Forecasting Act* a few months later, I was eager to start working on a House companion bill.

Last year, Senate Bill 141 passed the Senate by unanimous consent, and I introduced the House companion with a few additions

to that text with then-Representative Jim Bridenstine as my Republican cosponsor. Since last summer, I've been reminding and bugging the Chairman of my interest in the topic and calling for a hearing, and, good to his word, we had that hearing in April. And I thought all of the Members who participated in that hearing were engaged and interested in taking action.

After that hearing in April, I worked with Chairman Smith and my new lead Republican cosponsor, Representative Mo Brooks, to agree on legislative text the Chairman could support and which moves the ball forward on this subject. That is the text reflected in my amendment today.

This legislation will better coordinate Federal research investments with forecasters who provide warnings to affected industries and to ensure the academic community and commercial sector work hand-in-hand to improve space weather forecasting. This text takes a different approach about how to meet these goals than the Senate-passed bill, but with this shared goal in mind, it is another step toward getting space weather legislation signed into law this year.

This amendment builds upon the work done in 2015 under the Obama Administration and tasks the National Space Council and a newly created National Committee for Space Weather Observation and Forecasting with developing our national space weather priorities. It also requires the Office of Science and Technology Policy to develop a national space weather research roadmap to coordinate Federal research on space weather.

We found in the hearing—it showed that the commercial sector, the academic sector, and the Federal sector were all working kind of in silos and not collaborating in the way that would best serve all of us as Americans.

Throughout the bill, Federal agencies will be required to collaborate more with the academic community and the commercial sector, one of the driving factors behind the legislation. The bill also sets up formal mechanisms to help break down barriers between the research community and operational forecasters by encouraging sharing of information and requirements to improve the pipeline of new observations, technologies, models, and forecasts.

Today's markup is certainly not the end of the conversation. There were multiple referrals, and one of the desires—and I think as accomplished by the substitute—is to eliminate some if not all of the referrals.

Over the coming months, we will all have to work together, Chairman Smith, Ranking Member Johnson, Representative Brooks, along with the Senators Peters, Gardner, Thune, and Nelson from the Senate Commerce Committee. I'm confident we can take the two versions of this legislation and agree on a final text, which will pass the House and the Senate to be signed into law later this year.

I look forward to this continued dialog and the input we'll receive from the space weather community in the coming months.

I want to thank Representative Brooks for his help and for Chairman Smith for working with me.

I'd also like to thank the Ranking Member for her support of H.R. 3086 and strong collaborative legislation on space weather.

With that, I yield back.

Chairman SMITH. Thank you, Mr. Perlmutter.

The gentleman from Alabama, Mr. Brooks, is recognized for his comments on the amendment.

Mr. BROOKS. Thank you, Mr. Chairman, for bringing this legislation, the Perlmutter-Brooks amendment in the nature of a substitute up for Committee consideration today.

Space weather is an important issue because the consequences of a severe space weather event can be far-reaching and disastrous. The Perlmutter-Brooks amendment helps to establish a formal space weather observation and forecasting architecture that, hopefully, will help mitigate the harmful consequences of space weather to life and property on Earth and in space.

Space weather is a collection of physical processes, beginning at the sun with solar winds and ultimately affecting human activities on Earth and in space. Solar winds and their interaction with Earth's atmosphere are not as understood as they should be. Fortunately, numerous people and organizations are changing this. Scientists and engineers at Marshall Space Flight Center in my district have been at the forefront of this vital research for many years. Under the Perlmutter-Brooks amendment, their research will not only continue but improve so as to help advance the Nation's space weather knowledge to where it needs to be.

I thank my colleague, Mr. Perlmutter, for the leadership on space weather and his partnership on this amendment. I urge my colleagues to vote for it.

Mr. Chairman, I yield back.

PREPARED STATEMENT OF MR. BROOKS

Mr. Chairman, thank you for bringing this legislation and the Perlmutter-Brooks amendment in the nature of a substitute up for Committee consideration today. Space weather is an important issue because the consequences of a severe space weather event can be far-reaching and disastrous. The PerlmutterBrooks amendment helps to establish a formal space weather observation and forecasting architecture that, hopefully, will help mitigate the harmful consequences of space weather to life and property on Earth and in space.

Space weather is a collection of physical processes, beginning at the Sun with solar winds and ultimately affecting human activities on Earth and in space. Solar winds and their interaction with Earth's atmosphere are not as understood as they should be. Fortunately, numerous people and organizations are changing this. Scientists and engineers at Marshall Space Flight Center, in my district, have been at the forefront of this vital research for many years. Under the Perlmutter-Brooks amendment, their research will not only continue, but improve so as to help advance the nation's space weather knowledge to where it needs to be.

I thank my colleague, Mr. Perlmutter, for his leadership on space weather and his partnership on this amendment. I urge my colleagues to vote for it.

Chairman SMITH. Thank you, Mr. Brooks.

And I'll recognize myself to speak on the amendment as well.

And, first of all, I want to thank Mr. Perlmutter and Mr. Brooks for their hard work on this issue and urge my colleagues to support this bipartisan substitute to S. 141.

Their initiative for the safety and security of the American people and economy is welcome. The Perlmutter-Brooks amendment in the nature of a substitute will further the goals of S. 141 and better address the complex challenges posed by space weather and space weather events. By establishing a national coordinating framework and providing ways for the commercial sector, academic community, and international partners to contribute in innovative,

meaningful, and cost-saving ways, the amendment not only advances space weather observation and forecasting capabilities but also increases the vigor of the national space enterprise on the whole.

Again, I especially appreciate Mr. Perlmutter's efforts to move this legislation forward.

Does the gentleman from Colorado seek to be recognized again? With——

Mr. PERLMUTTER. I——

Chairman SMITH. With no objection, the gentleman is recognized.

Mr. PERLMUTTER. I have—I think this is where I do it. I have an amendment to the substitute amendment.

Chairman SMITH. If you'll give me 10 seconds——

Mr. PERLMUTTER. Oh, sorry.

Chairman SMITH [continuing]. We're on the way there.

The next amendment on the roster is a manager's amendment offered by the gentleman from Colorado, Mr. Perlmutter. And does the—I know the gentleman seeks to be recognized, and he is so recognized.

Mr. PERLMUTTER. Thanks, Mr. Chairman. I have an amendment to the substitute amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment to the Perlmutter amendment in the nature of a substitute to S. 141 offered by Mr. Perlmutter of Colorado, amendment number 002.

Chairman SMITH. Without objection, the amendment is considered as read, and the gentleman is recognized to explain that amendment.

Mr. PERLMUTTER. Thank you, Mr. Chairman.

And the Ranking Member was correct. Things were moving very quickly this weekend with conversations between me and the Chairman, Senators Gardner and Peters, about the changes that we have proposed in the substitute amendment. And we've got a couple other changes to the bill text that we worked on over the weekend.

So, in addition, there are technical changes to the amendment that will ensure that NOAA, NASA, and the NSF support both basic applied and research to improve the space weather forecasting. The amendment that I'm proposing now also requirements the priorities and plans under the bill to be reevaluated and updated at least every 4 years or more frequently, as deemed necessary by the Administration.

The amendment also makes clear the importance of space weather data and forecasting to successful deep-space exploration, which was suggested by Representative Brooks and is clearly a very important facet of the space weather legislation we're proposing.

I encourage all my colleagues to support the amendment to the substitute amendment, and I yield back.

Chairman SMITH. Thank you, Mr. Perlmutter.

And the gentleman from Alabama, Mr. Brooks, is recognized.

Mr. BROOKS. Mr. Chairman, I support the manager's amendment to the Perlmutter-Brooks amendment in the nature of a substitute. This amendment brings commonsense additions to the Perlmutter-Brooks amendment. One in particular merits emphasis. It's explic-

itly outlining the importance of space weather observation and forecasting to deep-space exploration. This manager's amendment makes it clear that not only can space weather impact us on the terrestrial frontier, Earth, but it can and will impact us in deep-space exploration as well.

I encourage my colleagues to vote for the manager's amendment, as well as the underlying Perlmutter-Brooks amendment in the nature of a substitute to Senate S. 141.

I yield back.

Chairman SMITH. And thank you, Mr. Brooks.

And the Ranking Member, Ms. Johnson, is recognized.

Ms. JOHNSON. Thank you, Mr. Chairman.

I do not oppose this manager's amendment. However, it is worth noting that we apparently need a 3-page manager's amendment to perfect an amendment in the nature of a substitute that was noticed 3 days ago. This just reinforces my opinion that our Committee has rushed to a poorly—to a markup of a poorly vetted piece of legislation.

I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

And the gentleman from California, Mr. Rohrabacher, is recognized.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman.

Today, we recognize the enormous impact that the sun has on the Earth, and today, we're focusing of course on the powerful danger that any type of hiccup on the sun could cause enormous damage here.

Let us just note the sun also—well, many of us believe has the—is the deciding factor as to what our climate will be like on the Earth. And this impact should not be ignored when we are debating the various issues that come before this Committee, and I just thought I would point out how important the sun is.

Thank you very much, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Rohrabacher.

The last amendment on the roster is an amendment in the nature of a substitute offered by the Ranking Member, Ms. Johnson, and she is recognized for that purpose.

Ms. JOHNSON. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman SMITH. The clerk will report the amendment.

The CLERK. Amendment in the nature of a substitute offered by Ms. Eddie Bernice Johnson of Texas to the amendment in the nature of a substitute offered by Mr. Perlmutter of Colorado, amendment number 035.

Chairman SMITH. Without objection, the amendment is considered as read and the Ranking Member is recognized to explain her amendment.

Ms. JOHNSON. Thank you, Mr. Chairman.

My amendment is very straightforward. The text of this amendment is drawn from the bipartisan *Space Weather Research and Forecasting Act*, H.R. 3086. This bill was introduced by my colleague from Colorado, Mr. Perlmutter, and I was the original cosponsor. It was also cosponsored by current NASA Administration, Mr. Jim Bridenstine, before he left the House.

The legislation was drafted in a bipartisan fashion with minority Committee staff involvement, unlike the amendment in the nature of a substitute being offered today by Mr. Perlmutter that neither I nor the staff saw until negotiations had already been completed.

This bill builds on the Senate-passed space weather legislation that we're marking up today with some additional improvements. These improvements include strengthening international, commercial, and academic collaboration and research to operations activities, incorporation of the National Academies' decadal survey recommendations, and providing for research in behavioral, economic, and social sciences for the improved national preparedness for space weather events.

In particular, this bill directs NOAA Administrator to enter into an agreement with the National Academies to establish a space weather government-industry-university roundtable to bring the various stakeholders together to facilitate communication and the transfer of knowledge, language that was widely supported by the community.

Many groups are supportive of H.R. 3086, including academia, scientific societies, and the commercial sector. I'd like to contrast this amendment with the amendment in the nature of a substitute noticed this past Saturday.

The text of my amendment has been vetted by the outside community for well over a year versus 3 days for the ANS. In fact, my staff found out that NOAA Legislative Affairs had not even been given a copy of the ANS until we reached out to them yesterday afternoon.

NOAA is one of the agencies most affected by this bill.

Our Committee held a hearing on space weather in April where H.R. 3086 was endorsed by the expert witnesses. We've had no hearings on the ANS because we've only just received it. My amendment also more closely resembles Senator Peters' Senate companion bill, which has already received unanimous support from the other body.

All of this suggests that my amendment represents a better and more rigorous thought-out policy choice than the ANS noticed this past weekend. Given the Senate's prior support of S. 141, I think adopting my amendment would also make it more likely that we can actually get a good bill enacted into law, which should be our goal as legislators.

I think we ought to be supporting the best policy in this Committee, and I hope my colleagues will do that today and support this amendment.

Thank you, and I yield back.

Chairman SMITH. Thank you, Ms. Johnson.

I'll recognize myself in opposition to the amendment.

On April 26, the Subcommittees on Environment and Space held a hearing titled "Surveying the Space Weather Landscape" in which Members learned about the potential negative impacts of space weather events and the current State of research, forecasting, and preparedness efforts related to space weather.

The Committee's position was always that more knowledge was needed before acting legislatively, and consideration of today's leg-

islation, which comes just over 3 months after the initial April hearing, is entirely consistent with that position.

Shortly after the April 26 hearing, Mr. Perlmutter began moving the ball forward on space weather legislation in a constructive, bipartisan manner. Mr. Perlmutter and his staff undertook proactive, good-faith negotiations and worked closely with the Committee in crafting the consensus text of the Perlmutter-Brooks amendment before us today. The Perlmutter-Brooks amendment in the nature of a substitute is a culmination of a rigorous bipartisan negotiation and represents a substantive good-faith effort to address a serious issue.

The amendment offered by the Ranking Member would reject those efforts, so I encourage my colleagues to vote against this amendment.

Does anyone else seek to be recognized?

The gentleman from Colorado.

Mr. PERLMUTTER. Thanks, Mr. Chairman.

And I can't dispute the Ranking Member's complaint that things really did accelerate over the course of the last few weeks, but on the other hand, we have been negotiating. My office has been negotiating with the Chairman and the Committee staff. We've been working on this. It really accelerated—all of this really accelerated over the weekend. Much of what's in House Resolution 3086 is in the substitute amendment, and there still is a long way to go to resolve this. And I appreciate the critiques by the Ranking Member, and I like 3086 better than my substitute amendment, but reality is that this is what we agreed on, and this is what I agreed on with Representative Brooks and with the Chairman and with the—Senator Peters so that we could advance this legislation and have it go through further conversation and negotiation as it goes through the process. So I like my bill, but I'll probably have to vote against it because I agreed on this substitute motion.

Chairman SMITH. Thank you, Mr. Perlmutter, for those comments.

Does anyone else seek to be recognized?

If not, we have a series of amendments to vote on. And if there are no further amendments, the question is on agreeing to the manager's amendment offered by the gentleman from Colorado, Mr. Perlmutter.

All in favor, say aye.

Opposed, no.

The ayes have it, and the amendment is agreed to.

The question is now on agreeing to the amendment in the nature of a substitute offered by the Ranking Member, Ms. Johnson.

Ms. JOHNSON. Record vote.

Chairman SMITH. All in favor, say aye.

Ms. JOHNSON. Record vote, please.

Chairman SMITH. I understand. The record vote has been requested, and the clerk will call the roll.

The CLERK. Mr. Smith?

Chairman SMITH. No.

The CLERK. Mr. Smith votes no.

Mr. Lucas?

Mr. LUCAS. No.

The CLERK. Mr. Lucas votes no.
Mr. Rohrabacher?
Mr. ROHRABACHER. No.
The CLERK. Mr. Rohrabacher votes no.
Mr. Brooks?
Mr. BROOKS. No.
The CLERK. Mr. Brooks votes no.
Mr. Hultgren?
Mr. HULTGREN. No.
The CLERK. Mr. Hultgren votes no.
Mr. Posey?
Mr. POSEY. No.
The CLERK. Mr. Posey votes no.
Mr. Massie?
[No response.]
The CLERK. Mr. Weber?
Mr. WEBER. No.
The CLERK. Mr. Weber votes no.
Mr. Knight?
Mr. KNIGHT. No.
The CLERK. Mr. Knight votes no.
Mr. Babin?
Mr. BABIN. No.
The CLERK. Mr. Babin votes no.
Mrs. Comstock?
Mrs. COMSTOCK. No.
The CLERK. Mrs. Comstock votes no.
Mr. Loudermilk?
Mr. LOUDERMILK. No.
The CLERK. Mr. Loudermilk votes no.
Mr. Abraham?
[No response.]
The CLERK. Mr. Palmer?
[No response.]
The CLERK. Mr. Webster?
Mr. WEBSTER. Nay.
The CLERK. Mr. Webster votes no? Thank you.
Mr. Biggs?
Mr. BIGGS. No.
The CLERK. Mr. Biggs votes no.
Mr. Marshall?
Mr. MARSHALL. No.
The CLERK. Mr. Marshall votes no.
Mr. Dunn?
Mr. DUNN. No.
The CLERK. Mr. Dunn votes no.
Mr. Higgins?
Mr. HIGGINS. No.
The CLERK. Mr. Higgins votes no.
Mr. Norman?
Mr. NORMAN. No.
The CLERK. Mr. Norman votes no.
Mrs. Lesko?
Mrs. LESKO. No.

The CLERK. Mrs. Lesko votes no.
Mr. Cloud?
[No response.]
The CLERK. Ms. Johnson?
Ms. JOHNSON. Aye.
The CLERK. Ms. Johnson votes yes.
Ms. Lofgren?
Ms. LOFGREN. Aye.
The CLERK. Ms. Lofgren votes yes.
Mr. Lipinski?
Mr. LIPINSKI. Aye.
The CLERK. Mr. Lipinski votes yes.
Ms. Bonamici?
[No response.]
The CLERK. Mr. Bera?
Mr. BERA. Yes.
The CLERK. Mr. Bera votes yes.
Ms. Esty?
Ms. ESTY. Aye.
The CLERK. Ms. Esty votes yes.
Mr. Veasey?
Mr. VEASEY. Aye.
The CLERK. Mr. Veasey votes yes.
Mr. Beyer?
Mr. BEYER. Aye.
The CLERK. Mr. Beyer votes yes.
Ms. Rosen?
Ms. ROSEN. Aye.
The CLERK. Ms. Rosen votes yes.
Mr. Lamb?
Mr. LAMB. Yes.
The CLERK. Mr. Lamb votes yes.
Mr. McNerney?
Mr. MCNERNEY. Yes.
The CLERK. Mr. McNerney votes yes.
Mr. Perlmutter?
Mr. PERLMUTTER. No.
The CLERK. Mr. Perlmutter votes no.
Mr. Tonko?
Mr. TONKO. Yes.
The CLERK. Mr. Tonko votes yes.
Mr. Foster?
[No response.]
The CLERK. Mr. Takano?
Mr. TAKANO. Yes.
The CLERK. Mr. Takano votes yes.
Ms. Hanabusa?
[No response.]
The CLERK. Mr. Crist?
Mr. CRIST. Yes.
The CLERK. Mr. Crist votes yes.
Chairman SMITH. The clerk will report the vote.
The CLERK. Mr. Chairman, 13 Members voted aye, 19 Members voted nay.

Chairman SMITH. The nays have it and the amendment is not agreed to.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th
Full Committee Roll Call
Working Quorum: 13 Reporting Quorum: 20

DATE: July 24, 2018

Bill: S. 141 AMENDMENT NO. 035
ROLL CALL NO. 1

Amendment Sponsor: Rep. Eddie Bernice Johnson DEFEATED

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* – *TX*		X		
2 Mr. LUCAS – *OK* **		X		
3 Mr. ROHRABACHER – *CA*		X		
4 Mr. BROOKS – *AL*		X		
5 Mr. HULTGREN – *IL*		X		
6 Mr. POSEY – *FL*		X		
7 Mr. MASSIE – *KY*				
8 Mr. WEBER – *TX*		X		
9 Mr. KNIGHT – *CA*		X		
10 Mr. BABIN – *TX*		X		
11 Mrs. COMSTOCK – *VA*		X		
12 Mr. LOUDERMILK – *GA*		X		
13 Mr. ABRAHAM – *LA*				
14 Mr. PALMER – *AL*				
15 Mr. WEBSTER – *FL*		X		
16 Mr. BIGGS – *AZ*		X		
17 Mr. MARSHALL – *KS*		X		
18 Mr. DUNN – *FL*		X		
19 Mr. HIGGINS – *LA*		X		
20 Mr. NORMAN – *SC*		X		
21 Mrs. LESKO – *AZ*		X		
22 Mr. CLOUD – *TX*				
1 Ms. JOHNSON, *Ranking* – *TX*	X			
2 Ms. LOFGREN – *CA*	X			
3 Mr. LIPINSKI – *IL*	X			
4 Ms. BONAMICI – *OR*				
5 Mr. BERA – *CA*	X			
6 Ms. ESTY – *CT*	X			
7 Mr. VEASEY – *TX*	X			
8 Mr. BEYER – *VA*	X			
9 Ms. ROSEN – *NV*	X			
10 Mr. LAMB – *PA*	X			
11 Mr. MCNERNEY – *CA*	X			
12 Mr. PERLMUTTER – *CO*		X		
13 Mr. TONKO – *NY*	X			
14 Mr. FOSTER – *IL*				
15 Mr. TAKANO – *CA*	X			
16 Ms. HANABUSA – *HI*				
17 Mr. CRIST – *FL*	X			
TOTALS	13	19		

** Vice Chair

* The vote was changed by unanimous consent to reflect a vote of No by Mr. Palmer and a vote of Aye by Ms. Bonamici.

The question is now on agreeing to the amendment in the nature of a substitute offered by the gentleman from Colorado, Mr. Perlmutter.

All in favor, say aye.

Those opposed, no.

The ayes have it and the amendment is agreed to.

A reporting quorum being present, I move that the Committee on Science, Space, and Technology report S. 141 to the House, as amended, with the recommendation that the bill be approved.

The question is on favorably reporting S. 141 to the House, as amended.

All in favor, say aye.

Those opposed, no.

The ayes have it, and S. 141, as amended, is ordered reportedly favorably to the House.

Without objection, the motion to reconsider is laid upon the table. S. 141, as amended, is ordered reported to the House with a favorable recommendation. I ask unanimous consent that the staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

H.R. 6468

Chairman SMITH. Pursuant to notice, I now call up H.R. 6468, the *Improving Science in Chemical Assessments Act*. And the clerk will report the bill.

The CLERK. H.R. 6468, a bill to direct that certain assessments with respect to toxicity of chemicals be carried out by the program offices of the Environmental Protection Agency and for other purposes.

Chairman SMITH. Without objection, the bill will be considered as read and open for amendment at any point, and I'll recognize myself to speak on the legislation.

Today, we are considering a bill that restores the scientific integrity of chemical toxicity assessments being conducted by the EPA. H.R. 6468 ensures that chemical hazard identification and dose response assessments will be transparent, complete, and tailored to the regulatory needs of EPA program offices.

I want to thank Chairman Biggs for his hard work on this legislation and urge my colleagues to support this bill.

And the bill's sponsor, the gentleman from Arizona, Mr. Biggs, is recognized to speak on the legislation.

Mr. BIGGS. Thank you, Mr. Chairman, for the opportunity to speak on behalf of my bill, the *Improving Science in Chemical Assessments Act*. This legislation ensures that chemical assessments conducted by the EPA will advance the Agency's core mission of protecting human health and the environment.

Specifically, the bill will eliminate EPA's flawed Integrated Risk Information System, or IRIS, and return the responsibility of conducting hazard identification and dose response assessments to the EPA's program offices, which are best situated to perform the work.

Without any foundation in law or direction from Congress, EPA administratively created the IRIS program in 1985 to "foster consistency" in chemical assessments conducted by EPA. Unfortu-

nately, IRIS has evolved into a program plagued by inefficiencies and a lack of transparency, resulting in questionable science that can have a significant impact on the marketplace.

When IRIS assigns a toxicity value to a chemical, Federal, State, and local regulatory authorities use it to make rules and regulations that can impact commerce. While in practice the program does not have any regulatory authority, the assessments produced by the program can still have a negative impact on the economy similar to the effect of regulation.

Over the past year, the Environment Subcommittee has conducted a hearing, hosted briefings with the EPA, met with stakeholders, and worked with our colleagues to learn more about the IRIS program. It has become very apparent that the program has lost its way. This bill will address the problems of the program by ensuring that any future chemical assessments performed are tailored to the regulatory need of the relevant EPA program office.

Let me be clear: Chemical toxicity assessments will still be performed by the Agency. They will just be performed by the program offices rather than IRIS. These future assessments will be stored in a publicly accessible chemical assessment data base, which will also retain the existing IRIS assessments.

Most importantly, this legislation promotes reliability in chemical hazard identification and dose response assessments by ensuring they will be carried out using the best available science and based on the weight of the scientific evidence.

The bill requires that the EPA meet stringent scientific standards when assessing any given chemical by considering the relevance of the data, the uncertainty in the scientific information, the extent to which it has been peer-reviewed, and whether the findings are reproducible.

Last, the bill creates a Chemical Hazard Identification and Dose Response Steering Committee, chaired by the Office of Research and Development, to prevent duplication of work performed by the program offices. The Steering Committee will also be authorized to consider third-party assessments as a supplement to the work being performed by the program offices, provided that the third-party assessments meet the scientific standards which are outlined in the bill. The *Chemical Assessment Improvement Act* is a commonsense effort to refocus EPA science back to its core mission.

I thank Chairman Smith, Vice Chairman Lucas, Environment Subcommittee Chairman Norman, Representatives Rohrabacher, Posey, Weber, Babin, Higgins, Lesko, Hultgren, Abraham, Webster, Marshall, and Dunn for cosponsoring this important legislation. I encourage the rest of my colleagues to support this bill.

PREPARED STATEMENT OF MR. BIGGS

Thank you, Mr. Chairman for the opportunity to speak on behalf of my bill, H.R. 6468, the *Improving Science in Chemical Assessments Act*.

This legislation ensures that chemical assessments conducted by the Environmental Protection Agency (EPA) will be transparent, reliable, and useful for program offices to carry out EPA's core mission of protecting human health and the environment.

Specifically, the bill will eliminate EPA's flawed Integrated Risk Information System, or IRIS, and return the responsibility of conducting hazard identification and dose response assessments to the agency's program offices, which are best situated to perform the work.

Without any foundation in law or direction from Congress, EPA administratively created the IRIS program in 1985 to "foster consistency" in chemical assessments conducted by EPA. Unfortunately, IRIS has evolved into a program plagued by inefficiencies and a lack of transparency, resulting in questionable science that can have a significant impact on the marketplace.

When IRIS assigns a toxicity value to a chemical, federal, state, and local regulatory authorities use it to make rules and regulations that can impact commerce. While in practice the program does not have any regulatory authority, the assessments produced by the program can still have a negative impact on the economy similar to the effect of regulation.

Over the past year, the Environment Subcommittee has conducted a hearing, hosted briefings with the EPA, met with stakeholders, and worked with our colleagues to learn more about the IRIS program. It has become very apparent that the program has lost its way.

H.R. 6468 will address the problems of the program by ensuring that any future chemical assessments performed are tailored to the regulatory need of the relevant EPA program office. Let me be clear: Chemical toxicity assessments will still be performed by the agency. They will just be performed by the program offices rather than IRIS. These future assessments will be stored in a publicly accessible Chemical Assessment Database, which will also retain the existing IRIS assessments.

Most importantly, this legislation promotes reliability in chemical hazard identification and dose response assessments by ensuring they will be carried out using the best available science and based on the weight of the scientific evidence. H.R. 6468 requires that the EPA meet stringent scientific standards when assessing any given chemical by considering the relevance of the data, the uncertainty in the scientific information, the extent to which it has been peer reviewed, and whether the findings are reproducible.

Lastly, the bill creates a chemical hazard identification and dose response steering committee, chaired by the Office of Research and Development, to prevent duplication of work performed by the program offices. The steering committee will also be authorized to consider third-party assessments as a supplement to the work being performed by the program offices provided that the third-party assessments meet the scientific standards outlined in the bill.

H.R. 6468 is common-sense legislation that will re-focus EPA science back to its core mission. I want to thank Chairman Smith, Vice Chairman Lucas, Environment Subcommittee Vice Chairman Norman, and Representatives Rohrabacher, Posey, Weber, Babin, Higgins, Lesko, Hultgren, Abraham, Webster, Marshall, and Dunn for cosponsoring this important legislation. I encourage the rest of my colleagues to support this bill, and I yield back the balance of my time.

Mr. BIGGS. Mr. Chairman, I also ask unanimous consent to enter into the record a letter from former Democratic Congressman Cal Dooley, the CEO of the American Chemistry Council, which represents more than 170 companies that do business in the field of chemistry, which supports the *Improving Science in Chemical Assessments Act*. This letter acknowledges that IRIS has had a, quote, "routine lack of transparency in the program, as well as failures in efficiency and direction that have mired the credibility of the program," close quote.

Furthermore, his letter asserts that the, quote, "legislation will ensure that EPA's program offices conduct chemical assessments in a timely manner consistent with the best available science," close quote.

So, Mr. Chairman, I ask that the—that that letter be incorporated into the record.

Chairman SMITH. OK. Without objection, so ordered.

Mr. BIGGS. And I encourage my colleagues to vote for this bill, and I yield back the balance of my time.

Chairman SMITH. OK. Thank you, Mr. Biggs.

The gentleman from New York, Mr. Tonko, is recognized.

Mr. TONKO. Mr. Chair, I move to strike the last word.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. TONKO. Thank you. I strongly oppose the bill, which would decimate the IRIS program. The IRIS program provides human health assessments of chemicals found in our environment. The IRIS program has reviewed hundreds of chemicals and supports programs across the entire agency. This is an important program that keeps us safe. We should not be gutting it; we should be ensuring that it has the resources and staff to thrive and continue to provide toxicity information. It does not make sense to tear apart this program and ignore research expertise.

By fragmenting the office, we would be creating a system where critical assessments would occur in other offices that lack the capacity and expertise to properly conduct these assessments. Instead, we would be giving an even louder voice to industry interests who would replace unbiased expertise. This would hurt public health and is a dangerous endeavor.

On EPA's own website it States the IRIS program is located within EPA's National Center for Environmental Assessment in the Office of Research and Development. The placement of the IRIS program in ORD is intentional. It ensures that IRIS can't develop impartial toxicity information independent of its use by EPA's programs and regional offices to set national standards and cleanup hazardous sites.

I'm also concerned by the secret science language in the bill. This type of language is thinly veiled campaign to limit serious and highly credible scientific research that supports critical regulatory action.

We also have seen a disturbing trend at EPA lately where science is being sidelined. I am extremely concerned by reports that the release of a study which detailed cancer risks from formaldehyde is being delayed, with the results kept hidden from the public. EPA's priority must be to protect public health and the environment. Weakening the IRIS program will likely delay other critical toxicity assessments, and some may never see the light of day.

In addition to my objections to the substance, I also have serious process concerns with this bill. Not only am I on this Committee, I also serve as the Ranking Member of the Energy and Commerce Subcommittee on the Environment. This bill meddles with existing regulatory and program requirements contained in the many public health statutes that EPA implements. These statutes are under the jurisdiction of the Committee on Energy and Commerce.

I understand that the majority has not had substantive discussions with the staff of Energy and Commerce Committee about this bill to avoid unintentional, overlapping, or adverse consequences in law and regulation.

Moreover, I am concerned by the process behind the first bill, H.R. 6399, the *Chemical Assessments Improvement Act*. That bill was introduced last Tuesday and noticed for a markup last Wednesday, but the House Parliamentarian determined that the bill was entirely within the jurisdiction of the Energy and Commerce Committee. The morning of the markup, the bill was abruptly pulled.

Before this bill is considered, the following questions should be answered: One, has Committee spoken with EPA, and have formal

comments from the Agency on this bill been received? If so, will the majority please share them?

Two, what other groups have been talked to about this bill? Can we see all the comments received from them on this bill.

Three, what is the cost estimate of this bill?

Four, what are the potential impacts of this bill on the programs and laws of EPA?

I do not believe we should be marking up this legislation at all. I will oppose this legislation and encourage my colleagues to do the same.

And with that, Mr. Chair, I yield back.

Chairman SMITH. Thank you, Mr. Tonko.

Are there other Members who wish to be heard?

Down here, the gentleman from Texas, Mr. Babin, is recognized.

Mr. BABIN. Yes, sir. Thank you, Mr. Chairman. I appreciate it.

Thank you for bringing forward this critical piece of legislation. I applaud the efforts of the Environmental Subcommittee Chairman Mr. Biggs of Arizona in introducing the *Improving Science in Chemical Assessments Act* to bring much-needed improvements to the way that EPA conducts dose response chemical assessments.

The mission of the EPA is protect human health and the environment, and this legislation will further empower the Agency to ensure that the assessments that it undertakes will do just that. The Committee has heard for too long about the issues facing the Integrated Risk Information System, or IRIS, program. In fact, the Committee held a hearing in which many concerns regarding scientific integrity and a lack of transparency in the IRIS process were raised. Similar concerns have also been raised by the National Academy of Sciences and the U.S. Government Accountability Office.

Given the shortcomings of the current program, it is necessary to make improvements to the way that chemicals are chosen and assessed. This legislation will improve coordination amongst the national program offices and regional offices by establishing a much-needed Steering Committee. This Committee will allow for chemicals to be appropriately selected for assessment, avoiding duplication, and ensuring that they meet a regulatory need.

Moreover, this legislation will ensure that EPA is using the best available science and rely on a weight-of-the-scientific evidence approach when performing these assessments. Together with the commonsense scientific standards further outlined in the bill, these principles will ensure greater certainty to the marketplace and to the American people.

As a cosponsor of H.R. 6468, the *Improving Science in Chemical Assessments Act*, I urge my colleagues to support this legislation. I want to thank you, and I yield back the balance of my time.

Chairman SMITH. Thank you, Mr. Babin.

And the gentlewoman from Oregon, Ms. Bonamici, is recognized.

Ms. BONAMICI. Thank you very much, Mr. Chairman. I move to strike the last word.

Chairman SMITH. The gentlewoman is recognized for 5 minutes.

Ms. BONAMICI. Thank you, Mr. Chairman.

I oppose the *Improving Science in Chemical Assessments Act* because it would effectively eliminate the Integrated Risk Informa-

tion System within the EPA's Office of Research and Development. The bill proposes a fragmented and weak system of conducting chemical assessments that would undermine the Agency's mission to protect human health.

The EPA created the IRIS back in 1985 to independently assess the toxicity of chemicals and to provide a consistent data base of human health assessments of chemicals that are found in our environment. It was specifically placed within ORD, so those tasked with protecting the public's health are able to make the best independent decisions they can by using the best available science to determine the potential harmful effects of chemical exposures.

The chemical assessment process requires advanced technical knowledge and expertise. Unfortunately, this bill would disperse the process across program offices within the EPA that do not have the scientific capacity to conduct the rigorous review required to provide a thorough chemical analysis. The bill would also allow for individual program offices to assign a range of toxicity values instead of a single toxicity value for chemical substances. This could allow regulated entities to essentially choose from a number of toxicity values that could lead to very disparate risk assessment decisions nationwide, and the consequences could be dangerous.

I'm also disappointed that, once again, this Committee chooses to ignore processes associated with an agency program. Both the National Academies and EPA's own Scientific Advisory Board, which is comprised of members selected by former Administrator Pruitt, have recently commended the IRIS program for its work conducting vital chemical assessments. In fact, the National Academies concluded that the EPA has been responsive to its previous recommendations regarding the IRIS program and has made substantial progress in their implementation.

Also, this bill was not written in a bipartisan fashion and is a shortsighted attempt by our majority to restrict science and allow for industry influence. It is imperative that these chemical assessments be conducted and the IRIS program should be placed in an impartial office like the ORD that has the scientific expertise required to provide critical toxicity information. Disassembling a program that relies on a science-based review process to conduct human health assessments and replacing it with a weakened substitute to placate industry is a disservice to the American public.

I oppose this dangerous bill. I align myself with Mr. Tonko's concerns about the Committee jurisdiction as well, and I urge my colleagues to vote no.

Thank you, Mr. Chairman. I yield back.

Chairman SMITH. Thank you, Ms. Bonamici.

And the gentleman from Florida, Mr. Dunn, is recognized for his comments.

Mr. DUNN. Thank you very much, Mr. Chairman, for bringing this important legislation markup, and thank you for your leadership on this, Chairman Biggs, introducing the *Improving Science in Chemical Assessments Act*.

This bill addresses many concerns raised by the National Academy of Sciences and the Government Accountability Office regarding the integrated risk program system that is the IRIS program at EPA. Both the National Academy of Sciences and the GAO have

been highly critical of the IRIS program and the process it uses to review chemicals. This bill improves the EPA's process for conducting these assessments.

In order to make these important changes, the *Improving Science in Chemical Assessments Act* will shift the responsibility of performing dose response chemical assessments to the national program offices at the EPA. These offices require such assessments to fulfill statutory requirements.

Moreover, the bill will codify the scientific principles that strengthen the quality of chemical assessments. Many of the scientific standards put forward in this legislation come directly from the EPA's own guidelines for undertaking assessments. These are commonsense standards that position the EPA to better protect human health and the environment.

As a cosponsor of H.R. 6468, the *Improving Science in Chemical Assessments Act*, I urge my colleagues to support this important bill.

Thank you, Mr. Chairman. I yield back.

Chairman SMITH. Thank you, Mr. Dunn.

And the gentleman from California, Mr. McNerney, is recognized.

Mr. MCNERNEY. Well, I thank the Chairman for yielding—or I move to strike the last word first.

Chairman SMITH. The gentleman is recognized for 5 minutes.

Mr. MCNERNEY. I want to thank the Chairman for giving me a few minutes here.

I'm going to oppose this purely partisan bill, H.R. 6468. Mr. Chairman, good legislation needs bipartisan input. We don't see that here. Second, I question the Committee's jurisdiction, again repeating what Mr. Tonko said. E&C, Energy and Commerce should be responsible to markup this bill. And third, of the many problems with this bill, I will focus on the politicization and introduction of conflict-of-interest influences in the chemical assessment process, as well as the overall degradation in the quality of chemical assessments if this bill were to become law.

H.R. 6468 sets up a Steering Committee that would be chaired by a political appointee and have the remainder of its membership appointed by the EPA Administrator, creating a highly politicized body that would be responsible for determining which assessments are carried out and by which program office. Additionally, the Steering Committee would have the ability to include third-party assessments and to choose the author of these assessments, essentially rolling out the welcome mat for further politicization of what should be inherently science-based process.

Moving chemical assessments conducted by the IRS—IRIS program out of the Office of Research and Development and into individual program offices at the EPA would offer gaps in scientific review process. Program offices use the toxicity information generated by the IRIS program to set national standards and cleanup hazardous sites. If only one program office is responsible for conducting an assessment on a given chemical, there's a danger that different routes of exposure could be ignored.

For example, under this bill, if more than one program office intends to conduct an assessment on a chemical, the previously described Steering Committee would choose which program office

would lead the chemical assessment. If this bill were to become law and a chemical assessment is needed to be conducted on lead, which program office would conduct it? If the Office of Air and Radiation took the lead, would it ignore the hazards of lead in water? Or if the Office of Water took charge, would it ignore the hazards of lead in the air?

Chemicals found in our environment don't always follow only one route of exposure and can be found across various media such as air, water, and soil. Relegating a chemical assessment to one program office would introduce bias in the way the assessments are conducted and lead to lower-quality assessments.

This bill would ultimately endanger human health. Dividing up chemical assessments among program offices is a recipe for problems as different routes of exposure to chemical hazards could be ignored or under-valuated and would allow for a bias to creep into these critical assessments. This is not acceptable for an agency charged with protecting human health. The IRIS program provides vital toxicity information that is relied upon by States, tribes, regions, and other Federal agencies, and they should continue to be housed in an impartial office of research and development that has the appropriate scientific expertise and capacity.

Mr. Chairman, I yield back, and I urge my colleagues to vote no on this bill.

Chairman SMITH. Thank you, Mr. McNerney.

And the gentleman from South Carolina, Mr. Norman, is recognized.

Mr. NORMAN. Thank you, Chairman Smith, for bringing this important legislation to a markup. And I also want to thank Environmental Subcommittee Chairman Andy Biggs for his leadership in sponsoring this *Improving Science in Chemical Assessments Act*, a bill that would increase transparency and efficiency in EPA's chemical toxicity assessment program.

H.R. 6468 is designed to refocus EPA science on its core mission of protecting humans and the—protecting human health and the environment. One of the priorities of President Trump's EPA has been to ensure that agency science is useful and relevant. This bill will make chemical toxicity data relevant for the regulatory needs of the EPA program offices and useful for States and localities, which will continue to have access to the data through the publicly available chemical assessments data base.

For years, the Internal—Integrated Risk Information System, or IRIS, program has been unresponsive to national programs office needs. The assessments take years, sometimes a decade to complete. Thus, by the time the assessments are complete, they're useless for the program offices, which must regulate within the statutory time limits.

This legislation guarantees that chemical assessments will be conducted efficiency—efficiently and will be valuable to national program offices to carry out their core functions. H.R. 6468 also creates a Steering Committee to coordinate functions and to prevent duplications of work among the program offices. EPA regional offices will sit on the Steering Committee and will thus continue to have a role in determining which assessments are needed for regulatory purposes.

Furthermore, this Steering Committee will be allowed to consider third-party assessments performed by academia, outside scientific bodies, foreign agencies, and industry, provided that these third-party assessments meet the stringent scientific standards in the legislation. This will increase the efficiency of the chemical assessment process by allowing program offices to use these third-party assessments as supplements and build off the work already done by others.

As a cosponsor of H.R. 6468, the *Improving Science in Chemical Assessments Act*, I urge my colleagues to support this bill.

Thank you, Mr. Chairman, and I yield back.

Chairman SMITH. Thank you, Mr. Norman.

If there are no other amendments, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 6468 to the House with the recommendation that the bill be approved.

The question is on favorably reporting H.R. 6468 to the House.

Ms. JOHNSON. Recorded.

Chairman SMITH. A recorded vote has been requested, and the clerk will call the roll.

The CLERK. Mr. Smith?

Chairman SMITH. No.

The CLERK. Mr. Smith votes no.

Chairman SMITH. I mean, thank you for looking up again. I was looking at Eddie Bernice Johnson. That's why I said no. I vote yes.

The CLERK. Mr. Smith votes yes.

Mr. Lucas?

[No response.]

The CLERK. Mr. Rohrabacher?

Mr. ROHRABACHER. I vote no but I'm going to change it to yes.

The CLERK. Mr. Rohrabacher votes yes.

Mr. Brooks?

Mr. BROOKS. Yes.

The CLERK. Mr. Brooks votes yes.

Mr. Hultgren?

[No response.]

The CLERK. Mr. Posey?

[No response.]

The CLERK. Mr. Massie?

[No response.]

The CLERK. Mr. Weber?

[No response.]

The CLERK. Mr. Knight?

Mr. KNIGHT. Yes.

The CLERK. Mr. Knight votes yes.

Mr. Babin?

Mr. BABIN. Yes.

The CLERK. Mr. Babin votes yes.

Mrs. Comstock?

[No response.]

The CLERK. Mr. Loudermilk?

[No response.]

The CLERK. Mr. Abraham?

Mr. ABRAHAM. Yes.

The CLERK. Mr. Abraham votes yes.
Mr. Palmer?
Mr. PALMER. Yes.
The CLERK. Mr. Palmer votes yes.
Mr. Webster?
Mr. WEBSTER. Yea.
The CLERK. Mr. Webster votes yes.
Mr. Biggs?
Mr. BIGGS. Aye.
The CLERK. Mr. Biggs votes yes.
Mr. Marshall?
Mr. MARSHALL. Yes.
The CLERK. Mr. Marshall votes yes.
Mr. Dunn?
Mr. DUNN. Yes.
The CLERK. Mr. Dunn votes yes.
Mr. Higgins?
Mr. HIGGINS. Yes.
The CLERK. Mr. Higgins votes yes.
Mr. Norman?
Mr. NORMAN. Yes.
The CLERK. Mr. Norman votes yes.
Mrs. Lesko?
Mrs. LESKO. Yes.
The CLERK. Mrs. Lesko votes yes.
Mr. Cloud?
[No response.]
The CLERK. Ms. Johnson?
Ms. JOHNSON. No.
The CLERK. Ms. Johnson votes no.
Ms. Lofgren?
Ms. LOFGREN. No.
The CLERK. Ms. Lofgren votes no.
Mr. Lipinski?
Mr. LIPINSKI. No.
The CLERK. Mr. Lipinski votes no.
Ms. Bonamici?
Ms. BONAMICI. No.
The CLERK. Ms. Bonamici votes no.
Mr. Bera?
Mr. BERA. No.
The CLERK. Mr. Bera votes no.
Ms. Esty?
Ms. ESTY. No.
The CLERK. Ms. Esty votes no.
Mr. Veasey?
Mr. VEASEY. No.
The CLERK. Mr. Veasey votes no.
Mr. Beyer?
Mr. BEYER. No.
The CLERK. Mr. Beyer votes no.
Ms. Rosen?
Ms. ROSEN. No.
The CLERK. Ms. Rosen votes no.

Mr. Lamb?
Mr. LAMB. No.
The CLERK. Mr. Lamb votes no.
Mr. McNerney?
Mr. MCNERNEY. No.
The CLERK. Mr. McNerney votes no.
Mr. Perlmutter?
Mr. PERLMUTTER. No.
The CLERK. Mr. Perlmutter votes no.
Mr. Tonko?
Mr. TONKO. No.
The CLERK. Mr. Tonko votes no.
Mr. Foster?
[No response.]
The CLERK. Mr. Takano?
Mr. TAKANO. No.
The CLERK. Mr. Takano votes no.
Ms. Hanabusa?
[No response.]
The CLERK. Mr. Crist?
[No response.]
The CLERK. Mr. Cloud?
Mr. CLOUD. Yes.
The CLERK. Mr. Cloud votes yes.
Mrs. Comstock?
Mrs. COMSTOCK. Yes.
The CLERK. Mrs. Comstock votes yes.
Mr. Massie?
Mr. MASSIE. Yes.
The CLERK. Mr. Massie votes yes.
Chairman SMITH. The clerk will report the vote.
The CLERK. Mr. Chairman, 17 Members voted ayes, 13 Members voted no.
OK. The ayes have it, and the bill is agreed to.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY - 115th

Full Committee Roll Call

Working Quorum: 13 Reporting Quorum: 20

DATE: July 24, 2018

Bill: H.R. 6468
ROLL CALL NO. 2

FINAL PASSAGE

PASSED

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. SMITH, *Chair* – *TX*	X			
2 Mr. LUCAS – *OK* **				
3 Mr. ROHRABACHER – *CA*	X			
4 Mr. BROOKS – *AL*	X			
5 Mr. HULTGREN – *IL*				
6 Mr. POSEY – *FL*				
7 Mr. MASSIE – *KY*	X			
8 Mr. WEBER – *TX*				
9 Mr. KNIGHT – *CA*	X			
10 Mr. BABIN – *TX*	X			
11 Mrs. COMSTOCK – *VA*	X			
12 Mr. LOUDERMILK – *GA*				
13 Mr. ABRAHAM – *LA*	X			
14 Mr. PALMER – *AL*	X			
15 Mr. WEBSTER – *FL*	X			
16 Mr. BIGGS – *AZ*	X			
17 Mr. MARSHALL – *KS*	X			
18 Mr. DUNN – *FL*	X			
19 Mr. HIGGINS – *LA*	X			
20 Mr. NORMAN – *SC*	X			
21 Mrs. LESKO – *AZ*	X			
22 Mr. CLOUD – *TX*	X			
1 Ms. JOHNSON, *Ranking* – *TX*		X		
2 Ms. LOFGREN – *CA*		X		
3 Mr. LIPINSKI – *IL*		X		
4 Ms. BONAMICI – *OR*		X		
5 Mr. BERA – *CA*		X		
6 Ms. ESTY – *CT*		X		
7 Mr. VEASEY – *TX*		X		
8 Mr. BEYER – *VA*		X		
9 Ms. ROSEN – *NV*		X		
10 Mr. LAMB – *PA*		X		
11 Mr. MCNERNEY – *CA*		X		
12 Mr. PERLMUTTER – *CO*				
13 Mr. TONKO – *NY*		X		
14 Mr. FOSTER – *IL*				
15 Mr. TAKANO – *CA*		X		
16 Ms. HANABUSA – *HI*				
17 Mr. CRIST – *FL*				
TOTALS	17	13		

** Vice Chair

Without objection, the motion to reconsider is laid upon the table. H.R. 6468 is ordered reported to the House. I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

If there's no further discussion, that completes our business. This concludes the Science Committee markup. Without objection, the gentleman, Mr. Palmer, is recognized.

Mr. PALMER. Mr. Chairman, I was unavoidably delayed by two hearings held simultaneously. I would like to be recorded on the—without objection, I would ask unanimous consent to be recorded as a no on the previous vote.

Chairman SMITH. OK. Without objection, no on—yes on this vote obviously but no on which vote, the——

Mr. PALMER. On the amendment.

Chairman SMITH. On the amendment. Is that clear enough? We had three votes.

Ms. JOHNSON. You got enough to pass.

Chairman SMITH. We know what you meant. OK. Let me ask the clerk, can we go through those amendments and make sure that Mr. Palmer knows which amendments he's voting on? Is that possible? Let's get—can you all help him out? We need——

Ms. BONAMICI. Mr. Chairman, I was detained and was late for the vote on Ms. Johnson's amendment and——

Chairman SMITH. OK.

Ms. BONAMICI [continuing]. Request unanimous consent to be recorded as an aye on the amendment vote.

Chairman SMITH. Without objection, the gentlewoman will be recorded as an aye on the Johnson amendment.

Ms. BONAMICI. Thank you, Mr. Chairman.

Chairman SMITH. And we're still going to get clarification from Mr. Palmer here. OK. OK. We'll put Mr. Palmer's comments in the record, but for purposes today, he was recorded as voting yes on final passage right now——

Mr. PALMER. Yes.

Chairman SMITH [continuing]. Is that correct? OK. Do we need to announce a recount on those previous votes, considering the Bonamici vote yes for the Johnson amendment and the Palmer vote yes on final?

The CLERK. Sir, the final passage of S. 141 was by voice vote.

Chairman SMITH. OK.

The CLERK. If Mr. Palmer would care to register his vote on Ms. Johnson's amendment to S. 141?

Chairman SMITH. OK. And, Mr. Palmer, is that a no on the Johnson amendment?

Mr. PALMER. It's a no on the Johnson amendment.

Chairman SMITH. OK. Without objection.

The CLERK. Sir, the final vote on Ms. Johnson's amendment to S. 141 is 20 Members—excuse me, 14 Members voting yes, 20 Members voting no.

Chairman SMITH. OK. Great. If there's no further discussion, this completes our business and this concludes the Science Committee markup. Without objection, the Committee stands adjourned.

[Whereupon, at 3:57 p.m., the Committee was adjourned.]

Appendix:

S. 141, Amendment Roster, H.R. 6468

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

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115TH CONGRESS
1ST SESSION

S. 141

IN THE HOUSE OF REPRESENTATIVES

MAY 3, 2017

Referred to the Committee on Science, Space, and Technology, and in addition to the Committees on Armed Services, Transportation and Infrastructure, Foreign Affairs, and the Permanent Select Committee on Intelligence, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

AN ACT

To improve understanding and forecasting of space weather events, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

SECTION 1. SHORT TITLE.

This Act may be cited as the "Space Weather Research and Forecasting Act".

SEC. 2. SPACE WEATHER.

(a) IN GENERAL.—Subtitle VI of title 51, United States Code, is amended by adding after chapter 605 the following:

"CHAPTER 607—SPACE WEATHER

"60701. Space weather.
"60702. Observations and forecasting.
"60703. Research and technology.
"60704. Space weather data.

"§ 60701. Space weather

"(a) FINDINGS.—Congress makes the following findings:

"(1) Space weather events pose a significant threat to humans working in the space environment and to modern technological systems.

"(2) The effects of severe space weather events on the electric power grid, satellites and satellite communications and information, airline operations, astronauts living and working in space, and space-based position, navigation, and timing systems could have significant societal, economic, national security, and health impacts.

"(3) Earth and space observations provide crucial data necessary to predict and warn about space weather events.

"(4) Clear roles and accountability of Federal departments and agencies are critical for an efficient and effective response to threats posed by space weather.

"(5) In October 2015, the National Science and Technology Council published a National Space Weather Strategy and a National Space Weather Action Plan seeking to integrate national space weather efforts and add new capabilities to meet increasing demand for space weather information.

"(b) FEDERAL AGENCY ROLES.—

"(1) FINDINGS.—Congress finds that—

"(A) the National Oceanic and Atmospheric Administration provides operational space weather forecasting and monitoring for civil applications, maintains ground and space-based assets to provide observations needed for forecasting, prediction, and warnings, and develops requirements for space weather forecasting technologies and science;

"(B) the Department of Defense provides operational space weather forecasting, moni-

1 toring, and research for the department's
2 unique missions and applications;
3 "(C) the National Aeronautics and Space
4 Administration provides increased under-
5 standing of the fundamental physics of the
6 Sun-Earth system through space-based observa-
7 tions and modeling, develops new space-based
8 technologies and missions, and monitors space
9 weather for NASA's space missions;
10 "(D) the National Science Foundation pro-
11 vides increased understanding of the Sun-Earth
12 system through ground-based measurements,
13 technologies, and modeling;
14 "(E) the Department of the Interior col-
15 lects, distributes, and archives operational
16 ground-based magnetometer data in the United
17 States and its territories, and works with the
18 international community to improve global geo-
19 physical monitoring and develops crustal con-
20 ductivity models to assess and mitigate risk
21 from space weather induced electric ground cur-
22 rents; and
23 "(F) the Federal Aviation Administration
24 provides operational requirements for space
25 weather services in support of aviation and for

1 coordination of these requirements with the
2 International Civil Aviation Organization, inte-
3 grates space weather data and products into the
4 Next Generation Air Transportation System,
5 and conducts real-time monitoring of the
6 charged particle radiation environment to pro-
7 tect the health and safety of crew and pas-
8 sengers during space weather events.
9 "(2) OFFICE OF SCIENCE AND TECHNOLOGY
10 POLICY.—The Director of the Office of Science and
11 Technology Policy shall—
12 "(A) coordinate the development and im-
13 plementation of Federal Government activities
14 to improve the Nation's ability to prepare,
15 avoid, mitigate, respond to, and recover from
16 potentially devastating impacts of space weath-
17 er events; and
18 "(B) coordinate the activities of the space
19 weather interagency working group established
20 under subsection (c).
21 "(c) SPACE WEATHER INTERAGENCY WORKING
22 GROUP.—In order to continue coordination of executive
23 branch efforts to understand, prepare, coordinate, and
24 plan for space weather, the National Science and Tech-

1 nology Council shall establish an interagency working
2 group on space weather.
3 "(d) MEMBERSHIP.—In order to understand and re-
4 spond to the adverse effects of space weather, the inter-
5 agency working group established under subsection (c)
6 shall leverage capabilities across participating Federal
7 agencies, including—
8 "(1) the National Oceanic and Atmospheric Ad-
9 ministration;
10 "(2) the National Aeronautics and Space Ad-
11 ministration;
12 "(3) the National Science Foundation;
13 "(4) the Department of Defense;
14 "(5) the Department of the Interior;
15 "(6) the Department of Homeland Security;
16 "(7) the Department of Energy;
17 "(8) the Department of Transportation, includ-
18 ing the Federal Aviation Administration; and
19 "(9) the Department of State.
20 "(e) INTERAGENCY AGREEMENTS.—
21 "(1) SENSE OF CONGRESS.—It is the sense of
22 Congress that the interagency collaboration between
23 the National Aeronautics and Space Administration
24 and the National Oceanic and Atmospheric Adminis-

1 tration on terrestrial weather observations pro-
2 vides—
3 "(A) an effective mechanism for improving
4 weather and climate data collection while avoid-
5 ing unnecessary duplication of capabilities
6 across Federal agencies; and
7 "(B) an agency collaboration model that
8 could benefit space weather observations.
9 "(2) INTERAGENCY AGREEMENTS.—The Ad-
10 ministrator of the National Aeronautics and Space
11 Administration and the Administrator of the Na-
12 tional Oceanic and Atmospheric Administration shall
13 enter into one or more interagency agreements pro-
14 viding for cooperation and collaboration in the devel-
15 opment of space weather spacecraft, instruments,
16 and technologies in accordance with this chapter.
17 **"§ 60702. Observations and forecasting**
18 "(a) POLICY.—It is the policy of the United States
19 to establish and sustain a baseline capability for space
20 weather observations.
21 "(b) INTEGRATED STRATEGY.—
22 "(1) IN GENERAL.—The Director of the Office
23 of Science and Technology Policy, in coordination
24 with the Administrator of the National Oceanic and
25 Atmospheric Administration, the Administrator of

1 the National Aeronautics and Space Administration,
2 the Director of the National Science Foundation,
3 and the Secretary of Defense, and in consultation
4 with the academic and commercial communities,
5 shall develop an integrated strategy for solar and
6 solar wind observations beyond the lifetime of cur-
7 rent assets, that considers—
8 "(A) the provision of solar wind measure-
9 ments and other measurements essential to
10 space weather forecasting; and
11 "(B) the provision of solar and space
12 weather measurements important for scientific
13 purposes.
14 "(2) CONSIDERATIONS.—In developing the
15 strategy under paragraph (1), the Director of the
16 Office of Science and Technology Policy shall con-
17 sider small satellite options, hosted payloads, com-
18 mercial options, international options, and prize au-
19 thority.
20 "(c) CRITICAL OBSERVATIONS.—In order to sustain
21 current space-based observational capabilities, the Admin-
22 istrator of the National Aeronautics and Space Adminis-
23 tration shall—
24 "(1) in cooperation with the European Space
25 Agency, maintain operations of the Solar and

1 Heliospheric Observatory/Large Angle and Spec-
2 trometric Coronagraph (referred to in this section as
3 'SOHO/LASCO') for as long as the satellite con-
4 tinues to deliver quality observations; and
5 "(2) prioritize the reception of LASCO data.
6 "(d) ADDITIONAL CAPABILITY FOR SOLAR IMAG-
7 ING.—
8 "(1) IN GENERAL.—The Administrator of the
9 National Oceanic and Atmospheric Administration
10 shall secure reliable secondary capability for near
11 real-time coronal mass ejection imagery.
12 "(2) OPTIONS.—The Administrator of the Na-
13 tional Oceanic and Atmospheric Administration, in
14 coordination with the Secretary of Defense and the
15 Administrator of the National Aeronautics and
16 Space Administration, shall develop options to build
17 and deploy one or more instruments for near real-
18 time coronal mass ejection imagery.
19 "(3) CONSIDERATIONS.—In developing options
20 under paragraph (2), the Administrator of the Na-
21 tional Oceanic and Atmospheric Administration shall
22 consider commercial solutions, prize authority, aca-
23 demic and international partnerships, microsatellites,
24 ground-based instruments, and opportunities to de-

1 ploy the instrument or instruments as a secondary
2 payload on an upcoming planned launch.
3 "(4) COSTS.—In implementing paragraph (1),
4 the Administrator of the National Oceanic and At-
5 mospheric Administration shall prioritize a cost-ef-
6 fective solution.
7 "(5) OPERATIONAL PLANNING.—The Adminis-
8 trator of the National Oceanic and Atmospheric Ad-
9 ministration shall develop an operational contingency
10 plan to provide continuous space weather forecasting
11 in the event of a SOHO/LASCO failure.
12 "(6) BRIEFING.—Not later than 120 days after
13 the date of enactment of the Space Weather Re-
14 search and Forecasting Act, the Administrator of
15 the National Oceanic and Atmospheric Administra-
16 tion shall provide a briefing to the Committee on
17 Commerce, Science, and Transportation of the Sen-
18 ate and the Committee on Science, Space, and Tech-
19 nology of the House of Representatives on the op-
20 tions for building and deploying the instrument or
21 instruments described in paragraph (2) and the
22 operational contingency plan developed under para-
23 graph (5).
24 "(e) FOLLOW-ON SPACE-BASED OBSERVATIONS.—
25 The Administrator of the National Oceanic and Atmos-

1 pheric Administration, in coordination with the Secretary
2 of Defense, shall develop requirements and a plan for fol-
3 low-on space-based observations for operational purposes,
4 in accordance with the integrated strategy developed
5 under subsection (b).

6 "(f) REPORT.—Not later than 180 days after the
7 date of enactment of the Space Weather Research and
8 Forecasting Act, the Director of the Office of Science and
9 Technology Policy shall submit to the Committee on Com-
10 merce, Science, and Transportation of the Senate and the
11 Committee on Science, Space, and Technology of the
12 House of Representatives a report on the integrated strat-
13 egy under subsection (b), including the plans for follow-
14 on space-based observations under subsection (e).

15 "(g) GROUND-BASED OBSERVATIONS.—The Na-
16 tional Science Foundation, the Air Force, and where prac-
17 ticable in support of the Air Force, the Navy shall each—

18 "(1) maintain and improve, as necessary and
19 advisable, ground-based observations of the Sun in
20 order to help meet the priorities identified in section
21 60703(a); and

22 "(2) provide space weather data by means of its
23 set of ground-based facilities, including radars,
24 lidars, magnetometers, radio receivers, aurora and

1 airglow imagers, spectrometers, interferometers, and
2 solar observatories.
3 "(h) GROUND-BASED OBSERVATIONS DATA.—The
4 National Science Foundation shall—
5 "(1) provide key data streams from the plat-
6 forms described in subsection (g) for research and to
7 support space weather model development;
8 "(2) develop experimental models for scientific
9 purposes; and
10 "(3) support the transition of the experimental
11 models to operations where appropriate.
12 **"§ 60703. Research and technology**
13 "(a) USER NEEDS.—
14 "(1) IN GENERAL.—The Administrator of the
15 National Oceanic and Atmospheric Administration,
16 the Secretary of the Air Force, and where prac-
17 ticable in support of the Air Force, the Secretary of
18 the Navy, in conjunction with the heads of other rel-
19 evant Federal agencies, shall conduct a comprehen-
20 sive survey to identify and prioritize the needs of
21 space weather forecast users, including space weath-
22 er data and space weather forecast data needed to
23 improve services and inform research priorities and
24 technology needs.

1 "(2) CONTENTS.—In conducting the com-
2 prehensive survey under paragraph (1), the Adminis-
3 trator of the National Oceanic and Atmospheric Ad-
4 ministration, the Secretary of the Air Force, and
5 where practicable in support of the Air Force, the
6 Secretary of the Navy, at a minimum, shall—
7 "(A) consider the goals for forecast lead
8 time, accuracy, coverage, timeliness, data rate,
9 and data quality for space weather observa-
10 tions;
11 "(B) identify opportunities to address the
12 needs identified under paragraph (1) through
13 collaborations with academia, the private sector,
14 and the international community;
15 "(C) identify opportunities for new tech-
16 nologies and instrumentation to address the
17 needs identified under paragraph (1); and
18 "(D) publish a report on the findings
19 under subparagraphs (A) through (C).
20 "(3) PUBLICATION.—Not later than 1 year
21 after the date of enactment of the Space Weather
22 Research and Forecasting Act, the Administrator of
23 the National Oceanic and Atmospheric Administra-
24 tion, the Secretary of the Air Force, and where prac-

1 ticable in support of the Air Force, the Secretary of
2 the Navy, shall—
3 "(A) make the results of the comprehen-
4 sive survey publicly available; and
5 "(B) notify the Committee on Commerce,
6 Science, and Transportation of the Senate and
7 the Committee on Science, Space, and Tech-
8 nology of the House of Representatives of the
9 publication under subparagraph (A).
10 "(b) RESEARCH ACTIVITIES.—
11 "(1) BASIC RESEARCH.—The Director of the
12 National Science Foundation, Administrator of the
13 National Aeronautics and Space Administration, and
14 Secretary of Defense shall continue to carry out
15 basic research activities on heliophysics, geospace
16 science, and space weather and support competitive,
17 merit-based, peer-reviewed proposals for research,
18 modeling, and monitoring of space weather and its
19 impacts, including science goals outlined in Solar
20 and Space Physics Decadal surveys conducted by the
21 National Academy of Sciences.
22 "(2) MULTIDISCIPLINARY RESEARCH.—
23 "(A) FINDINGS.—Congress finds that the
24 multidisciplinary nature of solar and space
25 physics creates funding challenges that require

1 coordination across scientific disciplines and
2 Federal agencies.
3 "(B) MULTIDISCIPLINARY RESEARCH.—
4 The Director of the National Science Founda-
5 tion, the Administrator of the National Oceanic
6 and Atmospheric Administration, and the Ad-
7 ministrator of the National Aeronautics and
8 Space Administration shall pursue multidisci-
9 plinary research in subjects that further our
10 understanding of solar physics, space physics,
11 and space weather.
12 "(C) SENSE OF CONGRESS.—It is the
13 sense of Congress that the Administrator of the
14 National Aeronautics and Space Administration
15 and Director of the National Science Founda-
16 tion should support competitively awarded
17 Heliophysics Science Centers.
18 "(c) SCIENCE MISSIONS.—The Administrator of the
19 National Aeronautics and Space Administration shall seek
20 to implement missions that meet the science objectives
21 identified in Solar and Space Physics Decadal surveys con-
22 ducted by the National Academy of Sciences.
23 "(d) RESEARCH TO OPERATIONS.—
24 "(1) IN GENERAL.—The Administrator of the
25 National Aeronautics and Space Administration, the

1 Director of the National Science Foundation, the
2 Administrator of the National Oceanic and Atmos-
3 pheric Administration, the Secretary of the Air
4 Force, and where practicable in support of the Air
5 Force, the Secretary of the Navy, shall—
6 "(A) develop a formal mechanism to tran-
7 sition National Aeronautics and Space Adminis-
8 tration, National Science Foundation, Air
9 Force, and Navy research findings, models, and
10 capabilities, as appropriate, to National Oceanic
11 and Atmospheric Administration and Depart-
12 ment of Defense space weather operational fore-
13 casting centers; and
14 "(B) enhance coordination between re-
15 search modeling centers and forecasting cen-
16 ters.
17 "(2) OPERATIONAL NEEDS.—The Adminis-
18 trator of the National Oceanic and Atmospheric Ad-
19 ministration and the Secretary of Defense, in coordi-
20 nation with the Administrator of the National Aero-
21 nautics and Space Administration and the Director
22 of the National Science Foundation, shall develop a
23 formal mechanism to communicate the operational
24 needs of space weather forecasters to the research
25 community.

"(e) TECHNOLOGY DEVELOPMENT.—

"(1) FINDINGS.—Congress finds that observations and measurements closer to the Sun and advanced instrumentation would provide for more advanced warning of space weather disturbances (as defined in section 3 of the Space Weather Research and Forecasting Act).

"(2) TECHNOLOGY AND INSTRUMENTATION DEVELOPMENT.—The Administrator of the National Aeronautics and Space Administration and the Director of the National Science Foundation shall support the development of technologies and instrumentation to improve space weather forecasting lead-time and accuracy to meet the needs identified by the Administrator of the National Oceanic and Atmospheric Administration.

"§ 60704. Space weather data

"(a) IN GENERAL.—The Administrator of the National Aeronautics and Space Administration and the Director of the National Science Foundation shall—

"(1) make space weather related data obtained for scientific research purposes available to space weather forecasters and operations centers; and

"(2) support model development and model applications to space weather forecasting.

"(b) RESEARCH.—The Administrator of the National Oceanic and Atmospheric Administration shall make space weather related data obtained from operational forecasting available for scientific research.".

(b) TECHNICAL AND CONFORMING AMENDMENTS.—

(1) REPEAL OF SECTION 809.—Section 809 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18388) and the item relating to that section in the table of contents under section 1(b) of that Act (124 Stat. 2806) are repealed.

(2) TABLE OF CHAPTERS.—The table of chapters of title 51, United States Code, is amended by adding after the item relating to chapter 605 the following:

"607. Space weather ..... 60701".

SEC. 3. SPACE WEATHER METRICS.

(a) DEFINITIONS.—In this section:

(1) SPACE WEATHER DISTURBANCE.—The term "space weather disturbance" includes geo-electric fields, ionizing radiation, ionospheric disturbances, solar radio bursts, and upper atmospheric expansion.

(2) SPACE WEATHER BENCHMARK.—The term "space weather benchmark" means the physical characteristics and conditions describing the nature,

1 frequency, and intensity of space weather disturb-
2 ances.
3 (b) BENCHMARKS.—
4 (1) PRELIMINARY.—Not later than 90 days
5 after the date of enactment of this Act, the Space
6 Weather Interagency Working Group, established
7 under section 60701 of title 51, United States Code,
8 in consultation with academic and commercial ex-
9 perts, shall—
10 (A) assess existing data, the historical
11 record, models, and peer-reviewed studies on
12 space weather; and
13 (B) develop preliminary benchmarks, based
14 on current scientific understanding and the his-
15 torical record, for measuring solar disturbances.
16 (2) FINAL.—Not later than 18 months after
17 the date the preliminary benchmarks are developed
18 under paragraph (1), the Space Weather Inter-
19 agency Working Group shall publish final bench-
20 marks.
21 (3) REVIEW.—The Administrator of the Na-
22 tional Aeronautics and Space Administration shall
23 contract with the National Academy of Sciences to
24 review the benchmarks established under paragraph
25 (2).

1 (4) REVISIONS.—The Space Weather Inter-
2 agency Working Group shall update and revise the
3 final benchmarks under paragraph (2), as necessary,
4 based on—
5 (A) the results of the review under para-
6 graph (3);
7 (B) any significant new data or advances
8 in scientific understanding that become avail-
9 able; or
10 (C) the evolving needs of entities impacted
11 by solar disturbances.

12 **SEC. 4. PROTECTION OF CRITICAL INFRASTRUCTURE.**

13 (a) IN GENERAL.—The Administrator of the Na-
14 tional Oceanic and Atmospheric Administration, in con-
15 sultation with the heads of other relevant Federal agen-
16 cies, shall provide information about space weather haz-
17 ards to the Secretary of Homeland Security for purposes
18 of this section.

19 (b) CRITICAL INFRASTRUCTURE.—The Secretary of
20 Homeland Security, in consultation with sector-specific
21 agencies, the Administrator of the National Oceanic and
22 Atmospheric Administration, and the heads of other rel-
23 evant agencies, shall—
24 (1) include, in meeting national critical infra-
25 structure reporting requirements, an assessment of

1 the vulnerability of critical infrastructure to space
2 weather events, as described by the space weather
3 benchmarks under section 3; and
4 (2) support critical infrastructure providers in
5 managing the risks and impacts associated with
6 space weather.
7 (c) PROHIBITION ON NEW REGULATORY AUTHOR-
8 ITY.—Nothing in subsection (b) may be construed to grant
9 the Secretary of Homeland Security any authority to pro-
10 mulgate regulations that was not in effect on the day be-
11 fore the date of enactment of this Act.
12 (d) DEFINITION OF SECTOR-SPECIFIC AGENCY.—In
13 this section, the term "sector-specific agency" has the
14 meaning given the term in Presidential Policy Directive–
15 21 of February 12, 2013 (Critical Infrastructure Security
16 and Resilience), or any successor.
17 **SEC. 5. PROTECTION OF NATIONAL SECURITY ASSETS.**
18 (a) IN GENERAL.—The National Security Council, in
19 consultation with the Office of the Director of National
20 Intelligence, the Secretary of Defense, and the heads of
21 other relevant Federal agencies, shall—
22 (1) assess the vulnerability of the national secu-
23 rity community to space weather events, as described
24 by the space weather benchmarks under section 3;
25 and

1 (2) develop national security mechanisms to
2 protection national security assets from space weath-
3 er threats.
4 (b) COOPERATION.—The Secretary of Defense, in
5 consultation with the heads of other relevant Federal
6 agencies, shall provide information about space weather
7 hazards to the National Security Council, Director of Na-
8 tional Intelligence, and heads of Defense Agencies for pur-
9 poses of this section.

10 **SEC. 6. ENSURING THE SAFETY OF CIVIL AVIATION.**

11 (a) IN GENERAL.—The Administrator of the Federal
12 Aviation Administration, in consultation with the heads of
13 other relevant Federal agencies, shall—
14 (1) assess the safety implications and vulner-
15 ability of the national airspace system by space
16 weather events, as described by the space weather
17 benchmarks under section 3;
18 (2) assess methods to mitigate the safety impli-
19 cations and effects of space weather on aviation
20 communication systems, aircraft navigation systems,
21 satellite and ground-based navigation systems, and
22 potential health effects of radiation exposure; and
23 (3) assess options for incorporating space
24 weather into operational training for pilots, cabin

1 crew, dispatchers, air traffic controllers, meteorolo-
2 gists, and engineers.
3 (b) SPACE WEATHER COMMUNICATION.—The Ad-
4 ministrator of the Federal Aviation Administration, in
5 consultation with the heads of other relevant Federal
6 agencies, shall develop methods to increase the interaction
7 between the aviation community and the space weather re-
8 search and service provider community.

Passed the Senate May 2, 2017.

Attest: JULIE E. ADAMS,
Secretary.

AMENDMENT IN THE NATURE OF A SUBSTITUTE TO S.141

OFFERED BY MR. PERLMUTTER

Strike all after the enacting clause and insert the following:

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the "Space Weather Coordi-
3 nation Act".

4 **SEC. 2. SPACE WEATHER.**

5 (a) IN GENERAL.—Subtitle VI of title 51, United
6 States Code, is amended by adding after chapter 605 the
7 following:

8 **"CHAPTER 606—SPACE WEATHER**

"Sec.
"60601. Space weather findings; policy.
"60602. Space weather coordination.
"60603. Space weather priorities, plan, and research roadmap.
"60604. Space weather reports.
"60605. Pilot program for obtaining commercial sector space weather data.
"60606. Definitions.

9 **"§ 60601. Space weather findings; policy**

10 "(a) FINDINGS.—Congress finds the following:

11 "(1) Space weather events pose a significant
12 threat to humans working in the space environment,
13 to modern technological systems, and critical terres-
14 trial infrastructure.

"(2) The effects of severe space weather events on the electric power grid, satellites and satellite communications and information, airline operations, astronauts living and working in space, and space based position, navigation, and timing systems could have significant societal, economic, national security, and health impacts.

"(3) Earth and space observations provide crucial data necessary to predict and warn about space weather events.

"(4) Clear roles and accountability of Federal departments and agencies are critical for an efficient and effective response to threats posed by space weather.

"(5) Observations and measurements closer to the sun and advanced instrumentation would provide for more advanced warning of solar activity resulting in space weather activity.

"(6) Coordination and collaboration between Federal departments and agencies, international partners, the academic community, and the commercial sector is necessary to improve the Nation's ability to understand, prepare for, avoid, mitigate, and respond to severe space weather events.

1 "(7) The commercial sector should be solicited
2 to support and enable Federal space weather activi-
3 ties and encouraged to provide and separately invest
4 in innovative space weather data and services.
5 "(b) STATEMENT OF NATIONAL POLICY.—It is the
6 policy of the United States that—
7 "(1) the United States should establish and
8 maintain baseline capabilities for space weather ob-
9 servation and forecasting to protect civil aviation,
10 space transportation, national security, human life,
11 critical infrastructure, commercial enterprise, and
12 economic vitality in the United States;
13 "(2) the establishment and maintenance of such
14 baseline capabilities for space weather should, to the
15 extent practicable, leverage the space weather obser-
16 vation capabilities, data, and services of the aca-
17 demic community and commercial sector;
18 "(3) space weather observation and forecasting
19 are not exclusive functions of the Federal Govern-
20 ment; and
21 "(4) the Federal Government should, as prac-
22 ticable, obtain space weather data and services
23 through contracts with the commercial sector, when
24 the data and services are available, cost-effective,
25 and add value.

1 **"§ 60602. Space weather coordination**

2 "(a) SENSE OF CONGRESS.—

3 "(1) NATIONAL SPACE COUNCIL.—It is the
4 sense of Congress that—

5 "(A) members of the National Space Coun-
6 cil are key stakeholders of the Federal Govern-
7 ment with respect to space weather;

8 "(B) the Users' Advisory Group of the Na-
9 tional Space Council should effectively and effi-
10 ciently represent and advocate on behalf of non-
11 governmental organizations and the academic
12 community within the Nation's space weather
13 enterprise; and

14 "(C) the National Space Council is the ap-
15 propriate Federal entity to review, establish,
16 and coordinate the Nation's space weather pri-
17 orities.

18 "(2) OFFICE OF SCIENCE AND TECHNOLOGY
19 POLICY.—It is the sense of Congress that the Office
20 of Science and Technology Policy—

21 "(A) efficiently and effectively identifies
22 opportunities and avenues to advance the lead-
23 ership of the United States in science and tech-
24 nology; and

25 "(B) is well positioned to identify opportu-
26 nities for advancement in coordination of space

1 weather research-to-operations and operations-
2 to-research.
3 "(b) COORDINATING AUTHORITY.—The National
4 Space Council shall oversee efforts and activities of the
5 Federal Government—
6 "(1) to implement the Nation's space weather
7 priorities; and
8 "(2) to prepare for, avoid, mitigate, and re-
9 spond to space weather events.
10 "(c) NATIONAL COMMITTEE FOR SPACE WEATHER
11 OBSERVATION AND FORECASTING.—
12 "(1) ESTABLISHMENT.—In order to address the
13 Nation's space weather priorities and further coordi-
14 nate efforts to monitor, prepare for, avoid, mitigate,
15 and respond to space weather events, the President
16 shall, in consultation with the Chair of the National
17 Space Council—
18 "(A) establish a committee with respect to
19 space weather observation and forecasting to be
20 known as the 'National Committee for Space
21 Weather Observation and Forecasting' (in this
22 chapter referred to as the 'National Com-
23 mittee'); and
24 "(B) establish one advisory committee for
25 the purpose specified in paragraph (3)(B), the

1 composition of which shall be determined by the
2 Co-Chairs of the National Committee and shall
3 include equal representation from the academic
4 community, commercial sector, and space
5 weather end users.
6 "(2) NATIONAL COMMITTEE COMPOSITION.—
7 The National Committee shall—
8 "(A) be co-chaired by the Administrator of
9 the National Aeronautics and Space Adminis-
10 tration, the Secretary of Defense, and the Sec-
11 retary of Commerce, or their designated rep-
12 resentatives, provided that such designated rep-
13 resentatives are of the Under Secretary or As-
14 sistant Secretary level or higher;
15 "(B) include as permanent voting members
16 all Federal departments or agencies determined
17 to be key space weather stakeholders or other-
18 wise necessary for inclusion as such permanent
19 voting members by the President, with the
20 agreement of the Chair of the National Space
21 Council; and
22 "(C) be empowered, with the approval of
23 the Chair of the National Space Council, to
24 allow a relevant, non-member Federal depart-
25 ment or agency to participate in meetings of

1 the National Committee as either a non-perma-
2 nent observer or semi-permanent liaison to the
3 National Committee.
4 "(3) DUTIES.—
5 "(A) NATIONAL COMMITTEE.—The duties
6 of the National Committee are the following:
7 "(i) To effectively and efficiently pro-
8 mote coordination between Federal agen-
9 cies, the academic community, and the
10 commercial sector to advance the Nation's
11 space enterprise.
12 "(ii) To coordinate the implementa-
13 tion of the national space weather plan de-
14 veloped under section 60603(b) across the
15 Federal Government, in partnership with
16 the academic community, international
17 partners, and the commercial sector.
18 "(iii) To collaborate with the Director
19 of the Office of Science and Technology
20 Policy to identify opportunities for the aca-
21 demic community and commercial sectors
22 to advance the understanding of space
23 weather.
24 "(B) ADVISORY COMMITTEES.—The duty
25 of the advisory committee established pursuant

1 to paragraph (1)(B) shall be to advise the Na-
2 tional Committee with respect to—
3 "(i) the development and implementa-
4 tion of the national space weather plan es-
5 tablished under section 60603(b); and
6 "(ii) the capabilities of the academic
7 community and the commercial sector to
8 meet the national space weather priorities
9 identified under section 60603(a).
10 "(d) USER SURVEY.—
11 "(1) IN GENERAL.—The Chair of the National
12 Space Council, in consultation with the heads of
13 other relevant Federal agencies, the academic com-
14 munity, and the commercial sector, shall direct the
15 Users' Advisory Group of the Council to conduct a
16 comprehensive survey to identify the space weather
17 observation, research, modeling, forecasting, and
18 prediction needs of the space weather user commu-
19 nity.
20 "(2) SURVEY CONSIDERATIONS.—The survey
21 conducted under paragraph (1) shall—
22 "(A) assess the adequacy of current Fed-
23 eral Government goals for lead time, accuracy,
24 coverage, timeliness, data rate, and data quality
25 for space weather observations and forecasting;

"(B) identify options and methods to, in consultation with the academic community and the commercial sector, improve the goals specified in subparagraph (A);

"(C) identify opportunities for the generation of new data to address the needs of the space weather user community;

"(D) identify methods to increase coordination of, with respect to space weather, research-to-operations and operations-to-research;

"(E) identify the most efficient and effective formal mechanism or mechanisms for the sharing of space weather data, operational forecasting needs, research needs, findings, models, and capabilities between the Federal Government, the academic community, the commercial sector, and the space weather user community;

"(F) identify opportunities for new technologies, research, and instrumentation to aid in research, understanding, monitoring, modeling, prediction, and forecasting of space weather; and

"(G) identify methods and technologies to improve preparedness for potential space weather events.

1 "(e) SPECIAL AUTHORITY.—In order to better under-
2 stand space weather, the National Space Council may le-
3 verage expertise from any Federal agency or partner, as
4 deemed appropriate by the Chair of the National Space
5 Council, including through the use of—
6 "(1) interagency agreements;
7 "(2) memoranda of understanding; and
8 "(3) shared personnel.

9 **"§ 60603. Space weather priorities, plan, and research**
10 **roadmap**

11 "(a) NATIONAL SPACE WEATHER PRIORITIES.—The
12 National Space Council, in consultation with the Users'
13 Advisory Group of the National Space Council, the aca-
14 demic community, and the commercial sector, shall estab-
15 lish national priorities for space weather, with respect to—
16 "(1) the protection of life and property;
17 "(2) the support of the leadership, economic de-
18 velopment, and national security of the United
19 States; and
20 "(3) the space weather prediction and fore-
21 casting needs of end-users.
22 "(b) NATIONAL SPACE WEATHER PLAN.—The Na-
23 tional Committee shall develop a national space weather
24 plan to implement the priorities established under sub-

1 section (a). Such plan shall, with respect to activities car-
2 ried out to meet such priorities—
3 "(1) delineate appropriate roles among Federal
4 agencies;
5 "(2) consider small satellite options, hosted
6 payloads, public-private partnerships, and commer-
7 cial options such as data-buys, and other acquisition
8 approaches, that maximize Federal investment and
9 minimize overall costs to the Federal Government;
10 "(3) identify specific research and development
11 activities and performance metrics needed to im-
12 prove operational space weather forecasting;
13 "(4) describe collaborative opportunities with
14 stakeholders, including the academic community,
15 nongovernmental organizations, the commercial sec-
16 tor, and foreign governments;
17 "(5) leverage the work conducted through the
18 National Space Weather Strategy and National
19 Space Weather Action Plan of the National Science
20 and Technology Council before the date of the enact-
21 ment of this section;
22 "(6) include a formal mechanism to share oper-
23 ational needs of space weather forecasters to the
24 academic community and commercial sector; and

1 "(7) appropriately prioritize the critical land-
2 based, sea-based, air-based, or space-based observa-
3 tion capabilities.
4 "(c) NATIONAL SPACE WEATHER RESEARCH ROAD-
5 MAP.—The Director of the Office of Science and Tech-
6 nology Policy shall issue a national space weather research
7 roadmap that—
8 "(1) considers the national space weather prior-
9 ities established under subsection (a);
10 "(2) considers the national space weather plan
11 issued under subsection (b);
12 "(3) considers the National Academy of
13 Sciences' decadal survey recommendations;
14 "(4) includes a formal mechanism that provides
15 for the sharing of the research needs, findings, mod-
16 els, and capabilities with space weather operational
17 forecasting centers; and
18 "(5) enhances coordination between research
19 modeling centers, forecasting centers, and the com-
20 mercial sector.
21 **"§ 60604. Space weather reports**
22 "(a) SURVEY AND PRIORITIES.—Not later than 180
23 days after the date of enactment of the Space Weather
24 Coordination Act, the Chair of the National Space Council
25 shall submit to the Committee on Science, Space, and

1 Technology of the House of Representatives and the Com-
2 mittee on Commerce, Science, and Transportation of the
3 Senate, a report on—
4 "(1) the findings of the user survey under sec-
5 tion 60602(d); and
6 "(2) the recommended space weather priorities
7 under section 60603(a).
8 "(b) NATIONAL SPACE WEATHER PLAN.—Not later
9 than 270 days after the date of enactment of the Space
10 Weather Coordination Act, the Chair of the National
11 Space Council shall submit to the Committee on Science,
12 Space, and Technology of the House of Representatives
13 and the Committee on Commerce, Science, and Transpor-
14 tation of the Senate, the national space weather plan de-
15 veloped under section 60603(b).
16 "(c) NATIONAL SPACE WEATHER RESEARCH ROAD-
17 MAP.—Not later than one year after the date of enactment
18 of the Space Weather Coordination Act, the Director of
19 the Office of Science and Technology Policy shall submit
20 to the Committee on Science, Space, and Technology of
21 the House of Representatives and the Committee on Com-
22 merce, Science, and Transportation of the Senate, the na-
23 tional space weather research roadmap issued under sec-
24 tion 60603(c).

1 **"§ 60605. Pilot program for obtaining commercial sec-**
2 **tor space weather data**
3 "(a) PILOT PROGRAM.—
4 "(1) ESTABLISHMENT.—Not later than one
5 year after the date of the enactment of the Space
6 Weather Coordination Act, the Secretary of Com-
7 merce, acting through the Under Secretary of Com-
8 merce for Oceans and Atmosphere (in this section
9 referred to as the 'Secretary'), shall establish a pilot
10 program under which the Secretary will offer to
11 enter into contracts with one or more entities in the
12 commercial sector for the provision to the Secretary
13 of space weather data generated by such an entity
14 that meets the standards and specifications pub-
15 lished under paragraph (2).
16 "(2) DATA STANDARDS AND SPECIFICATIONS.—
17 Not later than one year after the date of the enact-
18 ment of the Space Weather Coordination Act, the
19 Secretary shall publish standards and specifications
20 for ground-based, ocean-based, air-based, and space-
21 based commercial space weather data and metadata.
22 "(3) CONTRACTS.—
23 "(A) IN GENERAL.—Not later than 18
24 months after the date of enactment of the
25 Space Weather Coordination Act, the Secretary
26 shall offer to enter, through an open competi-

1 tion, into at least one contract with one or more
2 commercial sector entities capable of providing
3 space weather data that—
4 "(i) meets the standards and speci-
5 fications established by the Secretary for
6 providing such data; and
7 "(ii) is provided in a manner that al-
8 lows the Secretary to calibrate and evalu-
9 ate the data for use in space weather re-
10 search and forecasting models of the Na-
11 tional Oceanic and Atmospheric Adminis-
12 tration.
13 "(B) ASSESSMENT.—Not later than the
14 date that is 3 years after the date on which the
15 Secretary enters into a contract under subpara-
16 graph (A), the Secretary shall assess, and sub-
17 mit to the Committee on Science, Space, and
18 Technology of the House of Representatives
19 and the Committee on Commerce, Science, and
20 Transportation of the Senate a report on, the
21 extent to which data provided under such con-
22 tract meet the standards and specifications es-
23 tablished under paragraph (1) and the extent to
24 which the pilot program has demonstrated—

1 "(i) the viability of assimilating the
2 commercially provided data into National
3 Oceanic and Atmospheric Administration
4 space weather research and forecasting
5 models;
6 "(ii) whether, and by how much, the
7 data so provided add value to space weath-
8 er forecasts of the National Oceanic and
9 Atmospheric Administration; and
10 "(iii) the accuracy, quality, timeliness,
11 validity, reliability, usability, information
12 technology security, and cost-effectiveness
13 of obtaining commercial space weather
14 data from commercial sector providers.
15 "(4) AUTHORIZATION OF APPROPRIATIONS.—
16 There are authorized to be appropriated to carry out
17 this subsection $6,000,000 for each of fiscal years
18 2019 through 2022, to remain available until ex-
19 pended.
20 "(b) DATA AND HOSTED SATELLITE PAYLOADS.—
21 Notwithstanding any other provision of law, the Secretary
22 may enter into agreements for—
23 "(1) the purchase of space weather data
24 through contracts with commercial providers; and

1 "(2) the placement of space weather satellite in-
2 struments on payloads co-hosted by the Federal
3 Government and the commercial sector.
4 "(c) OBTAINING FUTURE DATA.—If an assessment
5 under subsection (a)(3)(B) demonstrates the ability of
6 commercial space weather data to meet data and metadata
7 standards and specifications published under subsection
8 (a)(2), the Secretary shall—
9 "(1) where appropriate, cost-effective, and fea-
10 sible, obtain space weather data from commercial
11 sector providers;
12 "(2) as early as possible in the acquisition proc-
13 ess for any future National Oceanic and Atmos-
14 pheric Administration space weather observational
15 capability, consider whether a suitable, cost-effective,
16 commercial capability is or will be available to meet
17 the observational requirements by the planned oper-
18 ational date of the system;
19 "(3) if a suitable, cost-effective, commercial ca-
20 pability is or will be available as described in para-
21 graph (2), determine whether it is in the national in-
22 terest to develop a governmental observational capa-
23 bility; and
24 "(4) submit to the Committee on Science,
25 Space, and Technology of the House of Representa-

1 tives and the Committee on Commerce, Science, and
2 Transportation of the Senate a report detailing any
3 determination made under paragraph (2) or (3).
4 "(d) DATA SHARING PRACTICES.—
5 "(1) IN GENERAL.—The Secretary shall, to the
6 extent practicable, leverage United States leadership
7 in space weather observation and forecasting to
8 incentivize international partners to increase their
9 space weather observational and forecasting capabili-
10 ties and contribute additional space weather observa-
11 tions, data, models, predictions, and forecasts. The
12 Under Secretary shall continue to meet international
13 data sharing agreements entered into prior to the
14 date of enactment of this Act.
15 "(2) NASA AND NSF DATA.—The Administra-
16 tor of the National Aeronautics and Space Ad-
17 ministration and the Director of the National
18 Science Foundation shall each make space weather
19 related data obtained for scientific research purposes
20 available to space weather forecasters, operations
21 centers, and the commercial sector and support
22 model development and model applications for space
23 weather forecasting.

1 "(3) NOAA DATA.—The Secretary shall make
2 space weather related data obtained from oper-
3 ational forecasting available for scientific research.
4 "(e) RESEARCH FOR IMPROVED SPACE WEATHER
5 FORECASTING.—The Secretary, the Director of the Na-
6 tional Science Foundation, and the Administrator of the
7 National Aeronautics and Space Administration shall sup-
8 port research on observation, technologies, and instrumen-
9 tation which could improve space weather forecasting lead
10 time and accuracy.
11 **"§ 60606. Definitions**
12 "In this chapter:
13 "(1) NATIONAL SPACE COUNCIL.—The term
14 'National Space Council' means the National Space
15 Council established under Executive Order 13803,
16 (82 Fed. Reg. 31429, relating to establishment of
17 National Space Council) or any successor entities as
18 determined by the President.".
19 (b) TECHINICAL AND CONFORMING AMENDMENTS.—
20 (1) CONFORMING REPEAL.—Section 809 of the
21 National Aeronautics and Space Administration Au-
22 thorization Act of 2010 (42 U.S.C. 18388) and the
23 item relating to that section in the table of contents
24 under section 1(b) of that Act (124 Stat. 2806) are
25 repealed.

1 (2) TABLE OF CHAPTERS.—The table of chap-
2 ters of title 51, United States Code, is amended by
3 adding after the item relating to chapter 605 the fol-
4 lowing:

"606. Space weather ..... 60601".

Amend the title so as to read: "An Act to improve understanding and forecasting of space weather and promote coordination between stakeholders, and for other purposes.".

AMENDMENT TO THE PERLMUTTER AMENDMENT IN THE NATURE OF A SUBSTITUTE TO S. 141

OFFERED BY MR. PERLMUTTER

Page 2, lines 1 through 7, amend to read as follows:

1 "(2) The effects of severe space weather events
2 on the electric power grid, satellites and satellite
3 communications, services, orbits and information,
4 airline operations, astronauts living and working in
5 space, and space based position, navigation, and tim-
6 ing systems could have significant societal, economic,
7 national security, and health impacts.

Page 2, after line 7, insert the following (and make such conforming changes as may be necessary):

8 "(3) Space weather observation and forecasting
9 are essential for the success of deep space explo-
10 ration.

Page 11, lines 10 through 12, amend to read as follows:

11 "(3) identify knowledge gaps and their resolu-
12 tion through specific research and development ac-

1 tivities to improve operational space weather fore-
2 casting;

Page 11, lines 22 through 24, amend to read as follows:

3 "(6) include a formal mechanism to share oper-
4 ational needs of space weather forecasters with Fed-
5 eral agencies engaged in space weather research and
6 development activities, the academic community, and
7 the commercial sector; and

Page 12, lines 12 and 13, amend to read as follows:

8 "(3) considers the National Academy of
9 Sciences, Engineering, and Medicine's decadal sur-
10 vey recommendations;

Page 13, after line 24, insert the following:

11 "(d) REVALUATION OF CONTENT.—Not later than
12 one year after the date on which each Presidential term
13 begins, as well as when determined to be necessary by the
14 Chair of the National Space Council during the inter-
15 vening years, the applicable entities shall review and as-
16 sess the content previously developed under this section
17 and update and resubmit such content when appropriate.

Page 19, lines 1 through 3, amend to read as follows:

1 "(3) NOAA DATA.—The Secretary shall work
2 with the academic community to make space weath-
3 er related data obtained from operational forecasting
4 available for scientific research.

Page 19, lines 4 through 10, amend to read as follows:

5 "(e) RESEARCH FOR IMPROVED SPACE WEATHER
6 FORECASTING.—The Secretary, the Director of the Na-
7 tional Science Foundation, and the Administrator of the
8 National Aeronautics and Space Administration shall sup-
9 port basic and applied research which could improve space
10 weather forecasting lead time and accuracy.

AMENDMENT IN THE NATURE OF A SUBSTITUTE OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS TO THE AMENDMENT IN THE NATURE OF A SUBSTITUTE OFFERED BY MR. PERLMUTTER

Strike all after the enacting clause and insert the following:

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the "Space Weather Re-
3 search and Forecasting Act".

4 **SEC. 2. SPACE WEATHER.**

5 (a) IN GENERAL.—Subtitle VI of title 51, United
6 States Code, is amended by adding after chapter 605 the
7 following:

8 **"CHAPTER 607—SPACE WEATHER**

"Sec.
"60701. Space weather.
"60702. Observations and forecasting.
"60703. Research and technology.
"60704. Space weather data.

9 **"§ 60701. Space weather**

10 "(a) FINDINGS.—Congress makes the following find-
11 ings:

1 "(1) Space weather events pose a significant
2 threat to humans working in the space environment
3 and to modern technological systems.
4 "(2) The effects of severe space weather events
5 on the electric power grid, satellites and satellite
6 communications and information, airline operations,
7 astronauts living and working in space, and space-
8 based position, navigation, and timing systems could
9 have significant societal, economic, national security,
10 and health impacts.
11 "(3) Earth and space observations provide cru-
12 cial data necessary to predict and warn about space
13 weather events.
14 "(4) Clear roles and accountability of Federal
15 departments and agencies are critical for an efficient
16 and effective response to threats posed by space
17 weather.
18 "(5) In October 2015, the National Science and
19 Technology Council published a National Space
20 Weather Strategy and a National Space Weather
21 Action Plan seeking to integrate national space
22 weather efforts and add new capabilities to meet in-
23 creasing demand for space weather information.
24 "(b) FEDERAL AGENCY ROLES.—
25 "(1) FINDINGS.—Congress finds that—

"(A) the National Oceanic and Atmospheric Administration provides operational space weather forecasting and monitoring for civil applications, maintains ground and space-based assets to provide observations needed for forecasting, prediction, and warnings, provides research to support operational responsibilities, and develops requirements for space weather forecasting technologies and science;

"(B) the Department of Defense provides operational space weather forecasting, monitoring, and research for the department's unique missions and applications;

"(C) the National Aeronautics and Space Administration provides increased understanding of the fundamental physics of the Sun-Earth system through space-based observations and modeling, develops new space-based technologies and missions, and monitors space weather for NASA's space missions;

"(D) the National Science Foundation provides increased understanding of the Sun-Earth system through ground-based measurements, technologies, and modeling;

"(E) the Department of the Interior collects, distributes, and archives operational ground-based magnetometer data in the United States and its territories, works with the international community to improve global geophysical monitoring, and develops crustal conductivity models to assess and mitigate risk from space weather-induced electric ground currents; and

"(F) the Federal Aviation Administration provides operational requirements for space weather services in support of aviation and for coordination of these requirements with the International Civil Aviation Organization, integrates space weather data and products into the Next Generation Air Transportation System, and conducts real-time monitoring of the charged particle radiation environment to protect the health and safety of crew and passengers during space weather events.

"(2) OFFICE OF SCIENCE AND TECHNOLOGY POLICY.—The Director of the Office of Science and Technology Policy shall—

"(A) coordinate the development and implementation of Federal Government activities

1 to improve the Nation's ability to prepare,
2 avoid, mitigate, respond to, and recover from
3 potentially devastating impacts of space weath-
4 er events; and
5 "(B) coordinate the activities of the space
6 weather interagency working group established
7 under subsection (c).
8 "(c) SPACE WEATHER INTERAGENCY WORKING
9 GROUP.—In order to continue coordination of executive
10 branch efforts to understand, prepare, coordinate, and
11 plan for space weather, the National Science and Tech-
12 nology Council shall establish an interagency working
13 group on space weather.
14 "(d) MEMBERSHIP.—In order to understand and re-
15 spond to the adverse effects of space weather, the inter-
16 agency working group established under subsection (c)
17 shall leverage capabilities across participating Federal
18 agencies, including—
19 "(1) the National Oceanic and Atmospheric Ad-
20 ministration;
21 "(2) the National Aeronautics and Space Ad-
22 ministration;
23 "(3) the National Science Foundation;
24 "(4) the Department of Defense;
25 "(5) the Department of the Interior;

"(6) the Department of Homeland Security;

"(7) the Department of Energy;

"(8) the Department of Transportation, including the Federal Aviation Administration; and

"(9) the Department of State.

"(e) INTERAGENCY AGREEMENTS.—

"(1) SENSE OF CONGRESS.—It is the sense of Congress that the interagency collaboration between the National Aeronautics and Space Administration and the National Oceanic and Atmospheric Administration on terrestrial weather observations provides—

"(A) an effective mechanism for improving weather and climate data collection while avoiding unnecessary duplication of capabilities across Federal agencies; and

"(B) an agency collaboration model that could benefit space weather observations.

"(2) INTERAGENCY AGREEMENTS.—The Administrator of the National Aeronautics and Space Administration and the Administrator of the National Oceanic and Atmospheric Administration shall enter into one or more interagency agreements providing for cooperation and collaboration in the development of space weather spacecraft, instruments,

1 and technologies and in the transition of research to
2 operations in accordance with this chapter.
3 "(f) INTERNATIONAL, COMMERCIAL, AND ACADEMIC
4 COLLABORATION.—Participating Federal agencies in the
5 space weather interagency working group established
6 under subsection (c) shall, to the extent practicable and
7 appropriate, increase engagement and cooperation with
8 the international, commercial, and academic communities
9 on the observational infrastructure, data, and scientific re-
10 search necessary to advance the characterization, pre-
11 diction, and mitigation of space weather events.
12 **"§ 60702. Observations and forecasting**
13 "(a) POLICY.—It is the policy of the United States
14 to establish and sustain a baseline space and ground-based
15 capability for space weather observations.
16 "(b) INTEGRATED STRATEGY.—
17 "(1) IN GENERAL.—The Director of the Office
18 of Science and Technology Policy, in coordination
19 with the Administrator of the National Oceanic and
20 Atmospheric Administration, the Administrator of
21 the National Aeronautics and Space Administration,
22 the Director of the National Science Foundation,
23 and the Secretary of Defense, and in consultation
24 with the academic and commercial communities,
25 shall develop an integrated strategy for space and

1 ground-based space weather observations, including
2 solar and solar wind observations beyond the lifetime
3 of current assets, that considers—
4 "(A) the provision of solar wind measure-
5 ments and other measurements essential to
6 space weather forecasting; and
7 "(B) the provision of solar and space
8 weather measurements important for scientific
9 purposes.
10 "(2) CONSIDERATIONS.—In developing the
11 strategy under paragraph (1), the Director of the
12 Office of Science and Technology Policy shall con-
13 sider small satellite and microsatellite options,
14 hosted payloads, commercial options, international
15 options, and prize authority.
16 "(c) CRITICAL OBSERVATIONS.—In order to sustain
17 current space-based observational capabilities, the Admin-
18 istrator of the National Aeronautics and Space Adminis-
19 tration shall—
20 "(1) as appropriate, in cooperation with the
21 European Space Agency, maintain operations of the
22 Solar and Heliospheric Observatory/Large Angle and
23 Spectrometric Coronagraph (referred to in this sec-
24 tion as 'SOHO/LASCO') for as long as the satellite
25 continues to deliver quality observations; and

1 "(2) prioritize the reception of LASCO data.

2 "(d) ADDITIONAL CAPABILITY FOR SOLAR IMAG-
3 ING.—

4 "(1) IN GENERAL.—The Administrator of the
5 National Oceanic and Atmospheric Administration
6 shall secure reliable secondary capability for near
7 real-time coronal mass ejection imagery.

8 "(2) OPTIONS.—The Administrator of the Na-
9 tional Oceanic and Atmospheric Administration, in
10 coordination with the Secretary of Defense and the
11 Administrator of the National Aeronautics and
12 Space Administration, shall develop options, includ-
13 ing commercial solutions, to build and deploy one or
14 more instruments for near real-time coronal mass
15 ejection imagery.

16 "(3) CONSIDERATIONS.—In developing options
17 under paragraph (2), the Administrator of the Na-
18 tional Oceanic and Atmospheric Administration shall
19 consider commercial solutions, prize authority, aca-
20 demic and international partnerships, small satellites
21 and microsatellites, ground-based instruments, and
22 opportunities to deploy the instrument or instru-
23 ments as a secondary payload on an upcoming
24 planned launch.

1 "(4) COSTS.—In implementing paragraph (1),
2 the Administrator of the National Oceanic and At-
3 mospheric Administration shall consider a cost-effec-
4 tive and reliable solution.
5 "(5) OPERATIONAL PLANNING.—The Adminis-
6 trator of the National Oceanic and Atmospheric Ad-
7 ministration shall develop an operational contingency
8 plan to provide continuous space weather forecasting
9 in the event of a SOHO/LASCO failure.
10 "(6) BRIEFING.—Not later than 120 days after
11 the date of enactment of the Space Weather Re-
12 search and Forecasting Act, the Administrator of
13 the National Oceanic and Atmospheric Administra-
14 tion shall provide a briefing to the Committee on
15 Commerce, Science, and Transportation of the Sen-
16 ate and the Committee on Science, Space, and Tech-
17 nology of the House of Representatives on the op-
18 tions for building and deploying the instrument or
19 instruments described in paragraph (2) and the
20 operational contingency plan developed under para-
21 graph (5).
22 "(e) FOLLOW-ON SPACE-BASED OBSERVATIONS.—
23 "(1) PLAN.—The Administrator of the National
24 Oceanic and Atmospheric Administration, in coordi-
25 nation with the Secretary of Defense, shall develop

1 requirements and a plan for follow-on space-based
2 observations for operational purposes, in accordance
3 with the integrated strategy developed under sub-
4 section (b).

5 "(2) RESEARCH NEEDS.—In developing the re-
6 quirements and plan under paragraph (1), the Ad-
7 ministrator of the National Oceanic and Atmos-
8 pheric Administration shall coordinate with the Na-
9 tional Aeronautics and Space Administration and
10 the National Science Foundation regarding the re-
11 search necessary to improve space weather fore-
12 casting and the space-based observations that will
13 advance research and development.

14 "(f) REPORT.—Not later than 180 days after the
15 date of enactment of the Space Weather Research and
16 Forecasting Act, the Director of the Office of Science and
17 Technology Policy shall submit to the Committee on Com-
18 merce, Science, and Transportation of the Senate and the
19 Committee on Science, Space, and Technology of the
20 House of Representatives a report on the integrated strat-
21 egy under subsection (b), including the Plan for follow-
22 on space-based observations under subsection (e).

23 "(g) REVIEW OF INTEGRATED STRATEGY.—

24 "(1) REVIEW.—The Director of the National
25 Science Foundation, in conjunction with Federal

1 agencies participating in the space weather inter-
2 agency working group established under section
3 60701(c), shall enter into an agreement with the
4 National Academies to review the integrated strat-
5 egy developed under subsection (b).
6 "(2) TRANSMITTAL.—The Director of the Na-
7 tional Science Foundation shall transmit the results
8 of the review required under paragraph (1) to the
9 Committee on Science, Space, and Technology of the
10 House of Representatives and the Committee on
11 Commerce, Science, and Transportation of the Sen-
12 ate not later than 18 months after the enactment of
13 the Space Weather Research and Forecasting Act.
14 "(h) GROUND-BASED OBSERVATIONS.—The Na-
15 tional Science Foundation, the Air Force, and, where
16 practicable in support of the Air Force, the Navy shall
17 each—
18 "(1) maintain and improve, as necessary and
19 advisable, ground-based observations of the Sun in
20 order to help meet the priorities identified in section
21 60703(a); and
22 "(2) provide space weather data by means of its
23 set of ground-based facilities, including radars,
24 lidars, magnetometers, radio receivers, aurora and

1 airglow imagers, spectrometers, interferometers, and
2 solar observatories.
3 "(i) GROUND-BASED OBSERVATIONS DATA.—The
4 National Science Foundation shall—
5 "(1) provide key data streams from the plat-
6 forms described in subsection (h) for research and to
7 support space weather model development;
8 "(2) develop experimental models for scientific
9 purposes; and
10 "(3) support the transition of the experimental
11 models to operations where appropriate.
12 **"§ 60703. Research and technology**
13 "(a) USER NEEDS.—
14 "(1) IN GENERAL.—The Administrator of the
15 National Oceanic and Atmospheric Administration,
16 the Secretary of the Air Force, and where prac-
17 ticable in support of the Air Force, the Secretary of
18 the Navy, in conjunction with the Administrator of
19 the National Aeronautics and Space Administration
20 and the heads of other relevant Federal agencies,
21 shall conduct a comprehensive survey to identify and
22 prioritize the needs of space weather forecast users,
23 including space weather data and space weather
24 forecast data needed to improve services and inform
25 research priorities and technology needs.

1 "(2) CONTENTS.—In conducting the com-
2 prehensive survey under paragraph (1), the Admini-
3 trator of the National Oceanic and Atmospheric Ad-
4 ministration, the Secretary of the Air Force, and
5 where practicable in support of the Air Force, the
6 Secretary of the Navy, at a minimum, shall—
7 "(A) consider the goals for forecast lead
8 time, accuracy, coverage, timeliness, data rate,
9 and data quality for space weather observa-
10 tions;
11 "(B) identify opportunities to address the
12 needs identified under paragraph (1) through
13 collaborations with academia, the commercial
14 sector, and the international community;
15 "(C) identify opportunities for new tech-
16 nologies, research, and instrumentation to ad-
17 dress the needs identified under paragraph (1);
18 and
19 "(D) publish a report on the findings
20 under subparagraphs (A) through (C).
21 "(3) PUBLICATION.—Not later than 1 year
22 after the date of enactment of the Space Weather
23 Research and Forecasting Act, the Administrator of
24 the National Oceanic and Atmospheric Administra-
25 tion, the Secretary of the Air Force, and where prac-

1 ticable in support of the Air Force, the Secretary of
2 the Navy, shall—
3 "(A) make the results of the comprehen-
4 sive survey publicly available; and
5 "(B) notify the Committee on Commerce,
6 Science, and Transportation of the Senate and
7 the Committee on Science, Space, and Tech-
8 nology of the House of Representatives of the
9 publication under subparagraph (A).
10 "(b) RESEARCH ACTIVITIES.—
11 "(1) BASIC RESEARCH.—The Director of the
12 National Science Foundation, Administrator of the
13 National Aeronautics and Space Administration, and
14 the Secretary of Defense shall continue to carry out
15 basic research activities on heliophysics, geospace
16 science, and space weather and support competitive,
17 merit-based, peer-reviewed proposals for research,
18 modeling, and monitoring of space weather and its
19 impacts, including science goals outlined in Solar
20 and Space Physics Decadal surveys conducted by the
21 National Academy of Sciences.
22 "(2) OTHER RESEARCH ACTIVITIES.—The Di-
23 rector of the National Science Foundation and the
24 Administrator of the National Oceanic and Atmos-
25 pheric Administration shall support basic research

1 activities in the social, behavioral, and economic
2 sciences that will lead to improved national pre-
3 paredness and encourage mitigation and protection
4 measures before a space weather event.

5 "(3) MULTIDISCIPLINARY RESEARCH.—

6 "(A) FINDINGS.—Congress finds that the
7 multidisciplinary nature of solar and space
8 physics creates funding challenges that require
9 coordination across scientific disciplines and
10 Federal agencies.

11 "(B) MULTIDISCIPLINARY RESEARCH.—
12 The Director of the National Science Founda-
13 tion, the Administrator of the National Oceanic
14 and Atmospheric Administration, and the Ad-
15 ministrator of the National Aeronautics and
16 Space Administration shall pursue multidisci-
17 plinary, coordinated research in subjects that
18 further our understanding of solar physics,
19 space physics, and space weather.

20 "(C) SENSE OF CONGRESS.—It is the
21 sense of Congress that the Administrator of the
22 National Aeronautics and Space Administration
23 and Director of the National Science Founda-
24 tion should support competitively awarded

1 Heliophysics Science Centers that support re-
2 search to operations and operations to research.
3 "(c) SCIENCE MISSIONS.—The Administrator of the
4 National Aeronautics and Space Administration shall seek
5 to implement missions that meet the science objectives
6 identified in Solar and Space Physics Decadal surveys con-
7 ducted by the National Academy of Sciences.
8 "(d) RESEARCH TO OPERATIONS.—
9 "(1) IN GENERAL.—The Administrator of the
10 National Aeronautics and Space Administration, the
11 Director of the National Science Foundation, the
12 Administrator of the National Oceanic and Atmos-
13 pheric Administration, the Secretary of the Air
14 Force, and where practicable in support of the Air
15 Force, the Secretary of the Navy, shall—
16 "(A) develop a formal mechanism to tran-
17 sition National Aeronautics and Space Adminis-
18 tration, National Science Foundation, Air
19 Force, and Navy research findings, research
20 needs, models, and capabilities, as appropriate,
21 to National Oceanic and Atmospheric Adminis-
22 tration and Department of Defense space
23 weather operational forecasting centers; and

1 "(B) enhance coordination between re-
2 search modeling centers and forecasting cen-
3 ters.
4 "(2) OPERATIONAL NEEDS.—The Adminis-
5 trator of the National Oceanic and Atmospheric Ad-
6 ministration and the Secretary of Defense, in coordi-
7 nation with the Administrator of the National Aero-
8 nautics and Space Administration and the Director
9 of the National Science Foundation, shall develop a
10 formal mechanism to communicate the operational
11 needs of space weather forecasters to the research
12 community.
13 "(e) TECHNOLOGY DEVELOPMENT.—
14 "(1) FINDINGS.—Congress finds that observa-
15 tions and measurements closer to the Sun and ad-
16 vanced instrumentation would provide for more ad-
17 vanced warning of space weather disturbances (as
18 defined in section 3 of the Space Weather Research
19 and Forecasting Act).
20 "(2) TECHNOLOGY AND INSTRUMENTATION DE-
21 VELOPMENT.—The Administrator of the National
22 Aeronautics and Space Administration and the Di-
23 rector of the National Science Foundation shall sup-
24 port the development of technologies and instrumen-
25 tation that address research priorities and improve

1 space weather forecasting lead-time and accuracy to
2 meet the needs identified by the Administrator of
3 the National Oceanic and Atmospheric Administra-
4 tion.

5 **"§ 60704. Space weather data**

6 "(a) IN GENERAL.—The Administrator of the Na-
7 tional Aeronautics and Space Administration and the Di-
8 rector of the National Science Foundation shall—

9 "(1) make space weather related data obtained
10 for scientific research purposes available to space
11 weather forecasters and operations centers; and

12 "(2) support model development and model ap-
13 plications to space weather forecasting.

14 "(b) RESEARCH.—The Administrator of the National
15 Oceanic and Atmospheric Administration shall make space
16 weather related data obtained from operational forecasting
17 available for scientific research.

18 "(c) SPACE WEATHER GOVERNMENT-INDUSTRY-
19 UNIVERSITY ROUNDTABLE.—The Administrator of the
20 National Oceanic and Atmospheric Administration, in col-
21 laboration with the Administrator of the National Aero-
22 nautics and Space Administration and the Director of the
23 National Science Foundation, shall enter into an arrange-
24 ment with the National Academies to establish a Space
25 Weather Government-Industry-University Roundtable to

1 facilitate communication and knowledge transfer among
2 Government participants in the space weather interagency
3 working group established under section 60701(c), indus-
4 try, and academia to—
5 "(1) facilitate advances in space weather pre-
6 diction and forecasting;
7 "(2) help enable the 2-way coordination of re-
8 search and operations; and
9 "(3) improve preparedness for potential space
10 weather events.".
11 (b) TECHNICAL AND CONFORMING AMENDMENTS.—
12 (1) REPEAL OF SECTION 809.—Section 809 of
13 the National Aeronautics and Space Administration
14 Authorization Act of 2010 (42 U.S.C. 18388) and
15 the item relating to that section in the table of con-
16 tents under section 1(b) of that Act (124 Stat.
17 2806) are repealed.
18 (2) TABLE OF CHAPTERS.—The table of chap-
19 ters of title 51, United States Code, is amended by
20 adding after the item relating to chapter 605 the fol-
21 lowing:

"607. Space weather ..... 60701".

22 **SEC. 3. SPACE WEATHER METRICS.**
23 (a) DEFINITIONS.—In this section:
24 (1) SPACE WEATHER DISTURBANCE.—The term
25 "space weather disturbance" includes geo-electric

1 fields, ionizing radiation, ionospheric disturbances,
2 solar radio bursts, and upper atmospheric expansion.
3 (2) SPACE WEATHER BENCHMARK.—The term
4 "space weather benchmark" means the physical
5 characteristics and conditions describing the nature,
6 frequency, and intensity of space weather disturb-
7 ances.
8 (b) BENCHMARKS.—
9 (1) PRELIMINARY.—Not later than 90 days
10 after the date of enactment of this Act, the space
11 weather interagency working group established
12 under section 60701(c) of title 51, United States
13 Code, in consultation with academic and commercial
14 experts, shall—
15 (A) assess existing data, the historical
16 record, models, and peer-reviewed studies on
17 space weather; and
18 (B) develop preliminary benchmarks, based
19 on current scientific understanding and the his-
20 torical record, for measuring solar disturbances.
21 (2) FINAL.—Not later than 18 months after
22 the date the preliminary benchmarks are developed
23 under paragraph (1), the space weather interagency
24 working group shall publish final benchmarks.

1 (3) REVIEW.—The Administrator of the Na-
2 tional Aeronautics and Space Administration shall
3 contract with the National Academy of Sciences to
4 review the benchmarks established under paragraph
5 (2).
6 (4) REVISIONS.—The space weather inter-
7 agency working group shall update and revise the
8 final benchmarks under paragraph (2), as necessary,
9 based on—
10 (A) the results of the review under para-
11 graph (3);
12 (B) any significant new data or advances
13 in scientific understanding that become avail-
14 able; or
15 (C) the evolving needs of entities impacted
16 by solar disturbances.
17 **SEC. 4. PROTECTION OF CRITICAL INFRASTRUCTURE.**
18 (a) IN GENERAL.—The Administrator of the Na-
19 tional Oceanic and Atmospheric Administration, in con-
20 sultation with the heads of other relevant Federal agen-
21 cies, shall provide information about space weather haz-
22 ards to the Secretary of Homeland Security for purposes
23 of this section.
24 (b) CRITICAL INFRASTRUCTURE.—The Secretary of
25 Homeland Security, in consultation with sector-specific

1 agencies, the Administrator of the National Oceanic and
2 Atmospheric Administration, and the heads of other rel-
3 evant agencies, shall—

4 (1) include, in meeting national critical infra-
5 structure reporting requirements, an assessment of
6 the vulnerability of critical infrastructure to space
7 weather events, as described by the space weather
8 benchmarks under section 3; and

9 (2) support critical infrastructure providers in
10 managing the risks and impacts associated with
11 space weather.

12 (c) PROHIBITION ON NEW REGULATORY AUTHOR-
13 ITY.—Nothing in subsection (b) may be construed to grant
14 the Secretary of Homeland Security any authority to pro-
15 mulgate regulations that was not in effect on the day be-
16 fore the date of enactment of this Act.

17 (d) DEFINITION OF SECTOR-SPECIFIC AGENCY.—In
18 this section, the term "sector-specific agency" has the
19 meaning given the term in Presidential Policy Directive–
20 21 of February 12, 2013 (Critical Infrastructure Security
21 and Resilience), or any successor.

22 **SEC. 5. PROTECTION OF NATIONAL SECURITY ASSETS.**

23 (a) IN GENERAL.—The National Security Council, in
24 consultation with the Office of the Director of National

1 Intelligence, the Secretary of Defense, and the heads of
2 other relevant Federal agencies, shall—
3 (1) assess the vulnerability of the national secu-
4 rity community to space weather events, as described
5 by the space weather benchmarks under section 3;
6 and
7 (2) develop national security mechanisms to
8 protect national security assets from space weather
9 threats.
10 (b) COOPERATION.—The Secretary of Defense, in
11 consultation with the heads of other relevant Federal
12 agencies, shall provide information about space weather
13 hazards to the National Security Council, Director of Na-
14 tional Intelligence, and heads of Defense Agencies for pur-
15 poses of this section.
16 **SEC. 6. ENSURING THE SAFETY OF CIVIL AVIATION.**
17 (a) IN GENERAL.—The Administrator of the Federal
18 Aviation Administration, in consultation with the heads of
19 other relevant Federal agencies, shall—
20 (1) assess the safety implications and vulner-
21 ability of the national airspace system by space
22 weather events, as described by the space weather
23 benchmarks under section 3;
24 (2) assess methods to mitigate the safety impli-
25 cations and effects of space weather on aviation

1 communication systems, aircraft navigation systems,
2 satellite and ground-based navigation systems, and
3 potential health effects of radiation exposure; and
4 (3) assess options for incorporating space
5 weather into operational training for pilots, cabin
6 crew, dispatchers, air traffic controllers, meteorolo-
7 gists, and engineers.
8 (b) SPACE WEATHER COMMUNICATION.—The Ad-
9 ministrator of the Federal Aviation Administration, in
10 consultation with the heads of other relevant Federal
11 agencies, shall develop methods to increase the interaction
12 between the aviation community and the space weather re-
13 search and service provider community.

.....
(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To direct that certain assessments with respect to toxicity of chemicals be carried out by the program offices of the Environmental Protection Agency, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To direct that certain assessments with respect to toxicity of chemicals be carried out by the program offices of the Environmental Protection Agency, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Improving Science in Chemical Assessments Act".

SEC. 2. RESEARCH NEEDS AND PRIORITIES OF EPA PROGRAM OFFICES.

The Environmental Research, Development, and Demonstration Authorization Act is amended by striking section 7 (42 U.S.C. 4364) and inserting the following:

"SEC. 7. RESEARCH NEEDS AND PRIORITIES OF EPA PROGRAM OFFICES.

"(a) IN GENERAL.—The Administrator of the Environmental Protection Agency shall assure that the expenditure of any funds appropriated pursuant to this Act or any other provision of law for environmental research and development related to regulatory program activities shall be coordinated with and reflect the research needs and priorities of the relevant program offices, as well as the overall research needs and priorities of the Agency, including those defined in the five-year research plan.

"(b) HAZARD IDENTIFICATION AND DOSE RESPONSE ASSESSMENTS.—Beginning on the date of the enactment of the Improving Science in Chemical Assessments Act, any covered assessments carried out with respect to a chemical substance through the Integrated Risk Information System program of the Environmental Protection Agency as of the day before such date of enactment shall, in lieu of being carried out through such program, be carried out by the relevant program office of the Environmental Protection Agency, so long as the relevant program

1 office determines there is a need for such an assessment.
2 Such an assessment shall be carried out using the sci-
3 entific standards specified in section 7B and be based on
4 the weight of the scientific evidence.

5 "(c) TOXICITY VALUES.—In carrying out a covered
6 assessment with respect to a chemical substance under
7 subsection (a), the relevant program office shall assign a
8 toxicity value or values, when scientifically supported by
9 the available data, for such chemical substance. With re-
10 spect to that assignment, the following shall apply:

11 "(1) When supported by the available data, the
12 toxicity value or values shall include a range of point
13 estimates of risk as well as sources and magnitudes
14 of uncertainty associated with the estimates.

15 "(2) When multiple point estimates can be de-
16 veloped, the relevant program office shall—

17 "(A) consider all datasets; and

18 "(B) make a determination about how best
19 to represent the human health risk posed by the
20 chemical substance involved.

21 "(d) CHEMICAL ASSESSMENT DATABASE.—

22 "(1) IN GENERAL.—A toxicity value or values
23 assigned to a chemical substance under subsection
24 (c) shall be included in a chemical assessment data-
25 base to be maintained by the Office of Research and

1 Development of the Environmental Protection Agen-
2 cy.
3 "(2) COMPLETED ASSESSMENTS.—All covered
4 assessments stored, as of the date of the enactment
5 of this Act, in the IRIS database of the Environ-
6 mental Protection Agency shall be retained in the
7 chemical assessment database established pursuant
8 to paragraph (1).
9 "(3) UPDATES.—Such database shall be up-
10 dated pursuant to a covered assessment performed
11 by a relevant program office, including to make a
12 change in the existing toxicity value or values for a
13 chemical substance included in such database.
14 "(e) CERTIFICATION.—Beginning 2 years after the
15 date of the enactment of the Improving Science in Chem-
16 ical Assessments Act and every 2 years thereafter, the Of-
17 fice of Research and Development of the Environmental
18 Protection Agency shall submit to the Committee on
19 Science, Space, and Technology and the Committee on
20 Energy and Commerce of the House of Representatives
21 and the Committee on Environment and Public Works of
22 the Senate, a report containing a certification that each
23 covered assessment completed during the period covered
24 by the report was conducted using the scientific standards
25 specified in section 7B.

"(f) DEFINITIONS.—In this section:

"(1) The term 'covered assessment' means, with respect to the evaluation of the human health effects resulting from chronic exposure to a chemical substance, a chemical hazard identification and dose response assessment (as such terms are defined by the Environmental Protection Agency on the day before the date of the enactment of this Act).

"(2) The term 'relevant program office' includes the following offices of the Environmental Protection Agency:

"(A) The Office of Water.

"(B) The Office of Air and Radiation.

"(C) The Office of Land and Emergency Management.

"(D) The Office of Chemical Safety and Pollution Prevention.

"(E) Any successor to an office specified in subparagraphs (A) through (D) and any other office determined to be relevant by the Administrator of the Environmental Protection Agency.

"SEC. 7A. HAZARD IDENTIFICATION AND DOSE RESPONSE STEERING COMMITTEE.

"(a) ESTABLISHMENT.—Not later than 30 days after the date of the enactment of this Act, the Administrator

1 of the Environmental Protection Agency shall establish a
2 chemical hazard identification and dose response steering
3 committee (referred to in this Act as the 'steering com-
4 mittee') to coordinate the conduct of covered assessments
5 by relevant program offices for purposes of ensuring that,
6 with respect to such assessments, there is no duplication
7 of effort by such offices.

8 "(b) DUTY.—The duties of the steering committee
9 are the following:

10 "(1) If the steering committee learns that more
11 than one relevant program office intends to conduct
12 covered assessments with respect to the same chem-
13 ical substance, the steering committee shall deter-
14 mine the most effective means of carrying out a sin-
15 gle covered assessment to prevent duplication of ef-
16 fort by such offices.

17 "(2) For purposes of supplementing a covered
18 assessment, the steering committee shall consider
19 any third-party assessment of a chemical substance
20 generated by another Federal, State, or inter-
21 national agency or agencies or members of the sci-
22 entific community that meets the requirements spec-
23 ified in subsection (e).

24 "(c) CHAIR; COMPOSITION.—

1 "(1) CHAIR.—The steering committee shall be
2 chaired by the Assistant Administrator of the Office
3 of Research and Development of the Environmental
4 Protection Agency.
5 "(2) COMPOSITION.—The steering committee
6 shall be composed of 15 members, all of whom shall
7 be active, full-time employees of the Environmental
8 Protection Agency, with at least one member rep-
9 resenting each relevant program office and each re-
10 gional office of the Environmental Protection Agen-
11 cy. The members of the steering committee shall be
12 appointed by the Administrator of the Environ-
13 mental Protection Agency. Any vacancy shall be
14 filled in the same manner as the initial appointment.
15 "(d) MEETINGS.—The steering committee shall meet
16 at least once each calendar year.
17 "(e) THIRD PARTY ASSESSMENT REQUIREMENTS.—
18 The requirements specified in this subsection with respect
19 to a third-party assessment of a chemical substance are
20 that the assessment —
21 "(1) is conducted using scientific standards
22 specified in section 7B;
23 "(2) has undergone independent scientific re-
24 view for transparency, completeness, and quality;
25 and

1 "(3) reflects the best available science and the
2 weight of the available scientific evidence.

3 **"SEC. 7B. SCIENTIFIC STANDARDS.**

4 " Covered assessments carried out under section 7
5 and discussion of such assessments and review of third
6 party assessments carried out under section 7A, shall be
7 conducted using scientific information, technical proce-
8 dures, measures, methods, protocols, methodologies, or
9 models in a manner consistent with the best available
10 science. In carrying out such an assessment, the relevant
11 program office shall integrate all lines of scientific evi-
12 dence and consider, as applicable—

13 "(1) the extent to which the scientific informa-
14 tion, technical procedures, measures, methods, proto-
15 cols, methodologies, or models employed to generate
16 the scientific information are reasonable for and con-
17 sistent with the intended use of the scientific infor-
18 mation;

19 "(2) the extent to which the scientific informa-
20 tion is relevant for the relevant program office's use
21 in making a decision about a chemical substance;

22 "(3) the degree of clarity and completeness with
23 which the data, assumptions, methods, quality assur-
24 ance, analyses employed to generate the scientific in-
25 formation are documented and publicly available in

a manner that honors legal and ethical obligations to reduce the risks of unauthorized disclosure and re-identification;

"(4) the extent to which the variability and uncertainty in the scientific information, or in the procedures, measures, methods, protocols, methodologies, or models, are evaluated and characterized;

"(5) the extent of independent verification or peer review of the scientific information or of the procedures, measures, methods, protocols, methodologies, or models;

"(6) the ability of the scientific findings and research to be replicated or reproduced; and

"(7) the extent to which the available scientific information supports dose-response modeling, using non-linear approaches.".