

I want to once again thank my colleagues on the Science, Space, and Technology Committee who have co-sponsored H.R. 4675, including Chairman LAMAR SMITH, Representative DAN LIPINSKI, and Energy Subcommittee Chairman RANDY WEBER. I also want to thank the numerous researchers and stakeholders who provided feedback as we developed this legislation.

I encourage my colleagues to support this bipartisan legislation, and I yield back the balance of my time.

The SPEAKER pro tempore. The question is on the motion offered by the gentleman from Kansas (Mr. MARSHALL) that the House suspend the rules and pass the bill, H.R. 4675, as amended.

The question was taken; and (two-thirds being in the affirmative) the rules were suspended and the bill, as amended, was passed.

A motion to reconsider was laid on the table.

ACCELERATING AMERICAN LEADERSHIP IN SCIENCE ACT OF 2018

Mr. HULTGREN. Mr. Speaker, I move to suspend the rules and pass the bill (H.R. 4377) to direct the Secretary of Energy to carry out certain upgrades to research equipment and construct research user facilities, and for other purposes, as amended.

The Clerk read the title of the bill.

The text of the bill is as follows:

H.R. 4377

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 2018”.

SEC. 2. ADVANCED PHOTON SOURCE UPGRADE.

(a) IN GENERAL.—The Secretary of Energy shall provide for the upgrade to the Advanced Photon Source described in the publication approved by the Basic Energy Sciences Advisory Committee on June 9, 2016, titled “Report on Facility Upgrades”, including the development of a multi-bend achromat lattice to produce a high flux of coherent x-rays within the hard x-ray energy region and a suite of beamlines optimized for this source.

(b) DEFINITIONS.—In this section:

(1) FLUX.—The term “flux” means the rate of flow of photons.

(2) HARD X-RAY.—The term “hard x-ray” means a photon with energy greater than 20 kiloelectron volts.

(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.—There are authorized to be appropriated to the Secretary for the Office of Science to carry out to completion the upgrade under this section—

- (1) \$93,000,000 for fiscal year 2018;
- (2) \$130,000,000 for fiscal year 2019;
- (3) \$152,400,000 for fiscal year 2020;
- (4) \$150,000,000 for fiscal year 2021;
- (5) \$73,600,000 for fiscal year 2022; and
- (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 full operations of the facility under this section occurs before December 31, 2026.

(d) FUNDING.—There are authorized to be appropriated to the Secretary for the Office of Science to carry out to completion the construction of the facility under this section—

- (1) \$95,000,000 for fiscal year 2018;
- (2) \$160,000,000 for fiscal year 2019;
- (3) \$195,000,000 for fiscal year 2020;
- (4) \$195,000,000 for fiscal year 2021;
- (5) \$200,000,000 for fiscal year 2022;
- (6) \$200,000,000 for fiscal year 2023;
- (7) \$195,000,000 for fiscal year 2024;
- (8) \$150,000,000 for fiscal year 2025; and
- (9) \$50,000,000 for fiscal year 2026.

SEC. 4. SPALLATION NEUTRON SOURCE PROTON POWER UPGRADE.

(a) IN GENERAL.—The Secretary of Energy shall provide for a proton power upgrade to the Spallation Neutron Source.

(b) DEFINITION OF PROTON POWER UPGRADE.—For the purposes of this section, the term “proton power upgrade” means the Spallation Neutron Source power upgrade 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.—There are authorized to be appropriated to the Secretary for the Office of Science to carry out to completion 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
- (7) \$2,900,000 for fiscal year 2024.

SEC. 5. SPALLATION NEUTRON SOURCE SECOND TARGET STATION.

(a) IN GENERAL.—The Secretary of Energy shall provide for a second target station for the Spallation Neutron Source.

(b) DEFINITION OF SECOND TARGET STATION.—For the purposes of this section, the term “second target station” means the Spallation Neutron Source second target station 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 second target station under this section occurs before December 31, 2030, with the option for early operation in 2028.

(d) FUNDING.—There are authorized to be appropriated to the Secretary for the Office of Science to carry out to completion the construction of the facility under this section—

- (1) \$5,000,000 for fiscal year 2018;
- (2) \$10,000,000 for fiscal year 2019;
- (3) \$15,000,000 for fiscal year 2020;
- (4) \$25,000,000 for fiscal year 2021;
- (5) \$50,000,000 for fiscal year 2022;
- (6) \$200,000,000 for fiscal year 2023;
- (7) \$275,000,000 for fiscal year 2024;
- (8) \$275,000,000 for fiscal year 2025;
- (9) \$275,000,000 for fiscal year 2026;
- (10) \$250,000,000 for fiscal year 2027; and
- (11) \$120,000,000 for fiscal year 2028.

SEC. 6. SPENDING LIMITATION.

No additional funds are authorized to be appropriated to carry out this Act and the amendments made by this Act, and this Act and such amendments shall be carried out using amounts otherwise available for such purpose.

The SPEAKER pro tempore. Pursuant to the rule, the gentleman from Illinois (Mr. HULTGREN) and the gentleman from Texas (Ms. EDDIE BERNICE JOHNSON) each will control 20 minutes.

The Chair recognizes the gentleman from Illinois.

GENERAL LEAVE

Mr. HULTGREN. Mr. Speaker, I ask unanimous consent that all Members may have 5 legislative days to revise and extend their remarks and to include extraneous material on H.R. 4377, the bill now under consideration.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from Illinois?

There was no objection.

Mr. HULTGREN. Mr. Speaker, I yield myself such time as I may consume.

Mr. Speaker, I rise today to urge support for H.R. 4377, the Accelerating American Leadership in Science Act.

This legislation is another key component in today's package of bills that maintains the American commitment to the basic scientific research necessary to advance our economy and maintain our national defense.

I commend Chairman SMITH for his work on these bills and his support for the underlying bill. I also thank my colleagues from Illinois for their bipartisan support of this legislation, as well as the ranking member for her support.

The Department of Energy operates and maintains a number of user facilities open to the broader research community which no one university or business could ever bring together. I have seen firsthand in Illinois the impact of these kinds of investments that they provide to the American public.

It was at Fermilab that the magnets were developed for the modern MRI machines we have all taken advantage of, and this was just an unintended by-product of basic scientific research by physicists trying to examine the smallest building blocks of matter.

□ 1645

This legislation authorizes funding for the Long-Baseline Neutrino Facility, going between Fermilab and the Sanford Lab in Lead, South Dakota, more than a mile underground.

This project is an important milestone in American science, serving as the first major internationally hosted facility in the United States.

Having already gained the support of more than 1,000 scientists from 30 different countries, this is a successful model for how large science will be done in the future.

Not only have we gained the support of the broader scientific community, but we have seen the investment from CERN for the first time outside of their lab, and the U.K. has already pledged \$88 million to be a part.

When America chooses to lead in these scientific fields, we bring the world with us and remain the single location for the best and brightest to continue doing their groundbreaking work.

It has been inspirational just to be a part of this process.

This legislation also authorizes funding for upgrades at the Advanced Photon Source at Argonne National Lab.

I have had the pleasure to see the work happening at this lab, which my two colleagues and cosponsors from Illinois represent.

The Advanced Photon Source is the premier facility for X-ray science in the United States. Nearly 6,000 researchers access this facility every year to do the kind of research that cannot be done at university campuses or industrial research facilities.

Every year, more than 1,000 researchers from Illinois alone access this facility.

With the wide-ranging applications for this facility, research coming from APS has led to two Nobel Prizes in chemistry and new treatments for HIV.

The work they are contributing on to better understand the materials for new batteries are chipping away at the energy storage advancements we need for newer, zero-emission energy sources to reliably come online.

These are the success stories we should be championing in Congress, and these are the kinds of results I want to continue seeing for future generations here in the United States.

Another facility which this legislation authorizes upgrades for is the Oak

Ridge National Laboratory's Spallation Neutron Source.

Similar to the two previous projects, this has received unanimous support from the research community with the DOE's Basic Energy Sciences Advisory Committee calling these upgrades "absolutely central to contribute to world-leading science."

With the most intense pulsed neutron beam in the world, the Spallation Neutron Source will continue probing material properties at the atomic level so that we can build better materials, with uses from better batteries, more target cures, to cleaner water.

Mr. Speaker, I reserve the balance of my time.

Ms. EDDIE BERNICE JOHNSON of Texas. Mr. Speaker, I yield myself such time as I may consume.

Mr. Speaker, I rise in support of H.R. 4377, Accelerating American Leadership in Science Act of 2018.

The Department of Energy is the home to the most advanced research facilities in the world. For decades, we have been able to provide scientists with the tools and resources to push the frontiers of innovation and answer the fundamental questions of science because we invested in our national laboratories, universities, and public-private partnerships in science and technology.

Unfortunately, we face budget proposals from this administration that seem to be completely out of touch with that rich history and the realities of our global competition.

This bill will put statutory requirements in place mandating that the Department of Energy fund crucial updates to use the facilities. The Basic Energy Sciences Advisory Committee recommended many of these upgrades to the DOE in a 2016 report.

In this bill, the Argonne National Laboratory would be authorized to upgrade the capabilities of the Advanced Photon Source. This upgrade will greatly advance our ability to determine the atomic and electronic structure of materials, molecular systems, and their chemical reactions.

The insight gained in these important experiments can be transformative for science and for our economy and for our well-being.

The bill also includes upgrades to the Spallation Neutron Source of Oak Ridge National Laboratory. The suite will soon be home to the most advanced neutron source in the world.

If we hope to maintain our leadership in neutron science, these two upgrades are critical.

Finally, this bill authorizes the Long-Baseline Neutrino Facility, the centerpiece of the international collaboration on the Deep Underground Neutrino Experiment.

U.S. leadership on this project is vital to maintaining our reputation as the world's leader in fundamental physical sciences research. Funding these facilities is planting the seeds of innovation and knowledge for future

generations. The fruit from these investments will benefit our society for years to come.

Mr. Speaker, I strongly support this bill and I encourage my colleagues to do the same, and I reserve the balance of my time.

Mr. HULTGREN. Mr. Speaker, I yield 3 minutes to the gentleman from Texas (Mr. SMITH), the distinguished chairman of the Science, Space, and Technology Committee.

Mr. SMITH of Texas. Mr. Speaker, I thank the gentleman from Illinois (Mr. HULTGREN) for yielding me time on his bill, H.R. 4377, the Accelerating American Leadership in Science Act.

Mr. Speaker, this legislation, cosponsored by Representative BILL FOSTER, Energy Subcommittee Chairman RANDY WEBER, Energy Subcommittee Vice Chairman STEVE KNIGHT, and Representative DAN LIPINSKI, authorizes funding from within the DOE's Office of Science's existing budget to complete construction of three science infrastructure projects.

The bill authorizes upgrades to the Advanced Photon Source at Argonne National Lab and the Spallation Neutron Source at Oak Ridge National Laboratory.

It also funds the construction of the Long-Baseline Neutrino Facility, which will be the premier international facility in high-energy physics.

The Advanced Photon Source is one of the most advanced radiation research facilities in the world. It produces ultrabright, high-energy X-ray beams that allow scientists to study the structure and behavior of materials, which enables the development of new technologies and pharmaceuticals.

The upgrade authorized at Argonne in the Hultgren bill will use new technology to increase the brightness of photon beams, allowing researchers to observe materials at extremely small scales.

The Spallation Neutron Source at Oak Ridge National Laboratory is a one-of-a-kind neutron scattering facility that provides the most intense pulsed neutron beams in the world for scientific research and industrial development.

This source of brighter, more intense neutrons enables scientists to make sensitive measurements in complex environments with higher resolution and speed than any existing neutron facility.

H.R. 4377 authorizes a power upgrade and a second target station to build on the success of the Spallation Neutron Source. The proton power upgrade will double the energy of the beam. The second target station will double the number of beam lines at the facility, significantly expanding the number of instrument stations and opportunities for cutting-edge neutron scattering research at Oak Ridge.

Combined, the authorized enhancements to the Advanced Photon Source and Spallation Neutron Source will allow these research tools to reach

their full potential and provide for world-leading Basic Energy Sciences programs here in the U.S.

Representative HULTGREN's bill also authorizes the Long-Baseline Neutrino Facility at Fermilab, a national accelerator lab. The LBNF will consist of the world's highest intensity neutrino beam and a suite of cryogenic near detectors to run the Deep Underground Neutrino Experiment. This experiment will measure the neutrino beam generated at LBNF on innovative, far detectors located 800 miles away at the Sanford Underground Research Facility in Lead, South Dakota.

Mr. Speaker, I thank Representative HULTGREN for his initiative in developing this legislation. His longstanding support of basic research and investments in these best-in-the-world science facilities is well known. H.R. 4377 is a commonsense bill that maintains American leadership in discovery science.

Mr. Speaker, I urge my colleagues to support this bipartisan legislation.

Mr. HULTGREN. Mr. Speaker, I yield 2 minutes to the gentleman from Texas (Mr. WEBER), the chairman of the Energy Subcommittee.

Mr. WEBER of Texas. Mr. Speaker, I thank Congressman HULTGREN for yielding me time.

Mr. Speaker, I rise today in support of H.R. 4377, the Accelerating American Leadership in Science Act of 2018.

This legislation authorizes very important upgrades to DOE photon and neutron sources at two national labs. In addition, it funds the construction of the Long-Baseline Neutrino Facility, the first international high-energy physics facility located in the United States of America.

Over 1,000 scientists from 30 countries are already collaborating on this project. Let me repeat that: over 1,000 scientists from 30 countries are already collaborating on this very important project.

Mr. Speaker, I again thank my colleague, Congressman HULTGREN, for introducing this important legislation and for his continued support of the national labs.

Ms. EDDIE BERNICE JOHNSON of Texas. Mr. Speaker, I yield back the balance of my time.

Mr. HULTGREN. Mr. Speaker, I again want to reiterate my support for this important legislation to keep the United States at the forefront of discovery and fundamental research.

Mr. Speaker, I thank my colleagues for their support. I encourage passage of H.R. 4377, and I yield back the balance of my time.

The SPEAKER pro tempore. The question is on the motion offered by the gentleman from Illinois (Mr. HULTGREN) that the House suspend the rules and pass the bill, H.R. 4377, as amended.

The question was taken; and (two-thirds being in the affirmative) the rules were suspended and the bill, as amended, was passed.

The title of the bill was amended so as to read: "A bill to direct the Secretary of Energy to carry out certain upgrades to research equipment and construct research user facilities, and for other purposes."

A motion to reconsider was laid on the table.

NUCLEAR ENERGY RESEARCH INFRASTRUCTURE ACT OF 2018

Mr. WEBER of Texas. Mr. Speaker, I move to suspend the rules and pass the bill (H.R. 4378) to direct the Secretary of Energy to carry out the construction of a versatile reactor-based fast neutron source, and for other purposes, as amended.

The Clerk read the title of the bill.

The text of the bill is as follows:

H.R. 4378

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 2018".

SEC. 2. VERSATILE NEUTRON SOURCE.

(a) IN GENERAL.—The Secretary of Energy shall provide for a versatile reactor-based fast neutron source, which shall operate as a national user facility. The Secretary shall consult with the private sector, universities, National Laboratories, and relevant Federal agencies to ensure that the versatile neutron source is capable of meeting Federal research needs for neutron irradiation services.

(b) FACILITY CAPABILITIES.—

(1) CAPABILITIES.—The Secretary shall ensure that the facility described in subsection (a) will provide, at a minimum, the following capabilities:

(A) Fast neutron spectrum irradiation capability.

(B) Capacity for upgrades to accommodate new or expanded research needs.

(2) CONSIDERATIONS.—In carrying out paragraph (1), the Secretary shall consider the following:

(A) Capabilities that support experimental high-temperature testing.

(B) Providing a source of fast neutrons at a neutron flux higher than that at which existing research facilities operate, sufficient to enable research for an optimal base of prospective users.

(C) Maximizing irradiation flexibility and irradiation volume to accommodate as many concurrent users as possible.

(D) Capabilities for irradiation with neutrons of a lower energy spectrum.

(E) Multiple loops for fuels and materials testing of different coolants.

(F) Capabilities that support irradiating and processing targets for isotope production.

(G) Additional pre-irradiation and post-irradiation examination capabilities.

(H) Lifetime operating costs and lifecycle costs.

(c) START OF OPERATIONS.—The Secretary shall, to the maximum extent practicable, ensure that the start of full operations of the facility under this section occurs before December 31, 2025.

(d) FUNDING.—There are authorized to be appropriated to the Secretary for the Office of Nuclear Energy to carry out to completion the construction of the facility under this section—

(1) \$35,000,000 for fiscal year 2018;

(2) \$100,000,000 for fiscal year 2019;

(3) \$200,000,000 for fiscal year 2020;

(4) \$260,000,000 for fiscal year 2021;

(5) \$340,000,000 for fiscal year 2022;

(6) \$350,000,000 for fiscal year 2023;

(7) \$350,000,000 for fiscal year 2024; and

(8) \$350,000,000 for fiscal year 2025.

SEC. 3. SPENDING LIMITATION.

No additional funds are authorized to be appropriated to carry out this Act and the amendments made by this Act, and this Act and such amendments shall be carried out using amounts otherwise available for such purpose.

The SPEAKER pro tempore. Pursuant to the rule, the gentleman from Texas (Mr. WEBER) and the gentlewoman from Texas (Ms. EDDIE BERNICE JOHNSON) each will control 20 minutes.

The Chair recognizes the gentleman from Texas.

GENERAL LEAVE

Mr. WEBER of Texas. Mr. Speaker, I ask unanimous consent that all Members may have 5 legislative days within which to revise and extend their remarks and to include extraneous material on H.R. 4378, the bill now under consideration.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from Texas?

There was no objection.

Mr. WEBER of Texas. Mr. Speaker, I yield myself such time as I may consume.

Mr. Speaker, I rise in support of H.R. 4378, the Nuclear Energy Research Infrastructure Act of 2018.

Over the past 3 years, the Science, Space, and Technology Committee has held hearings, met with stakeholders, and worked extensively with our colleagues in the Senate to draft the Nuclear Energy Innovation Capabilities Act, the precursor to today's bill.

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 the DOE to build that research reactor.

Mr. Speaker, this bill passed the House three times last Congress, and passed the House again in January as a part of H.R. 589, known as the DOE Research and Innovation Act.

The research reactor, or Versatile Neutron Source, authorized in that bill, Mr. Speaker, 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.

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While modeling and simulation can accelerate R&D, nuclear energy research must be validated through a physical source, Mr. Speaker, like a reactor. The bill which we will consider today, H.R. 4378, the Nuclear Energy Research Infrastructure Act, authorizes specific funding from within the DOE Office of Nuclear Energy for the construction of that versatile neutron source.