

Building this open-access user facility in the DOE national lab system will facilitate nuclear energy research in the United States. The access to fast neutrons that this reactor provides can support private sector development of the next generation materials and fuels needed 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, which will expedite regulatory approval for those advanced nuclear reactors. Without this user facility, Mr. Speaker, this research simply will not take place, and we cannot afford to lose the ability to develop an innovative nuclear technology right 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.

Mr. Speaker, as more developing nations look to nuclear energy to grow their economies, our role in protecting nuclear technology grows. By building this user facility, we will fortify the U.S. commitment to safely advancing nuclear energy. H.R. 4378 is a commonsense bill. It will maintain American leadership in nuclear power.

I want to thank Ranking Member JOHNSON and Chairman SMITH for cosponsoring this important legislation and for their leadership in advocating for nuclear energy research and development. I am very grateful for the opportunity to work with my fellow Texans to guide research that will keep America not only safe, but globally competitive.

Mr. Speaker, I encourage my colleagues to support this bill, and 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. 4378, the Nuclear Energy Research Infrastructure Act, and I am pleased to cosponsor this bill. Mr. Speaker, this legislation marks another accomplishment in our committee's strong bipartisan effort to support the development of advanced nuclear energy technologies.

Today, 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 this resource 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 early last year 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 before us today would provide the Department of Energy with the direction and funding it needs to create a national user facility with critical capabilities to enable the development of a wide range of advanced nuclear energy concepts here in the United States.

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 significantly safer, less expensive, more efficient, and produces less waste than the current fleet of reactors.

Mr. Speaker, I also strongly support the inclusion of 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 the authorizing committee.

In particular, it helps ensure that the 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 of their hard-earned dollars.

Mr. Speaker, I encourage my colleagues to support this bipartisan bill, and I look forward to continuing to work with my colleagues on both sides of the aisle as we strive to strengthen America's research enterprise across the board.

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

Mr. WEBER of Texas. Mr. Speaker, it is my distinct honor to yield 3 minutes to the gentleman from Texas (Mr. SMITH), the chairman of the full Science, Space, and Technology Committee.

Mr. SMITH of Texas. Mr. Speaker, first of all, let me thank the gentleman from Texas, the chairman of the Energy Subcommittee, Representative RANDY WEBER, for yielding me time on his bill, which is H.R. 4378, the Nuclear Energy Research Infrastructure Act.

H.R. 4378, cosponsored by full committee Ranking Member EDDIE BERNICE JOHNSON, Energy Subcommittee Vice Chairman STEVE KNIGHT, Representative DAN LIPINSKI, and Representative RANDY HULTGREN, authorizes funds within the DOE Nuclear Energy budget to construct their 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.

This legislation builds on and implements Chairman WEBER's Nuclear Energy Innovation Capabilities Act, which passed the House three times with bipartisan support in the last Congress.

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 that U.S. companies develop critical advanced reactor technology here in the United States.

Today, the only source of fast neutrons available for civilian research is in Russia, making it impossible for American entrepreneurs to conduct the testing and validation needed to deploy commercial advanced reactors.

America must also maintain our edge in nuclear science in order to influence global nonproliferation standards. The user facility authorized in this legislation will ensure the next generation of nuclear technology is safely developed here at home. This allows America to export nuclear technology which helps prevent civilian nuclear energy technology from being misused for weapons development overseas.

I want to thank this bill's cosponsors, Chairman WEBER and Ranking Member JOHNSON, for their long-standing support of nuclear energy innovation and commitment to ensure that we have the best nuclear research facilities.

Mr. Speaker, I urge my colleagues to support this legislation. It is a bipartisan piece of legislation.

Ms. EDDIE BERNICE JOHNSON of Texas. Mr. Speaker, I rise in support of the bill, and I yield back the balance of my time.

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

Mr. Speaker, H.R. 4378 is vital to ensuring America's leadership in nuclear innovation. By harnessing the unique expertise of our Nation's national labs, the private sector can take the lead in developing groundbreaking advanced nuclear technology.

I especially want to thank my colleagues on the Science, Space, and Technology Committee who have cosponsored H.R. 4378, including Chairman LAMAR SMITH, Representative DAN LIPINSKI, Representative STEVE KNIGHT, and Representative RANDY HULTGREN. I also want to thank the dozens of researchers and stakeholders who have provided feedback as we developed this legislation.

Mr. Speaker, I urge adoption of this commonsense, bipartisan legislation, and I yield back the balance of my time.

The SPEAKER pro tempore (Mr. TIPTON). The question is on the motion offered by the gentleman from Texas (Mr. WEBER) that the House suspend the rules and pass the bill, H.R. 4378, 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.

DEPARTMENT OF ENERGY RESEARCH INFRASTRUCTURE ACT OF 2018

Mr. WEBER of Texas. Mr. Speaker, I move to suspend the rules and pass the

bill (H.R. 4376) 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, as amended.

The Clerk read the title of the bill.

The text of the bill is as follows:

H.R. 4376

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 2018”.

SEC. 2. ADVANCED LIGHT SOURCE UPGRADE.

(a) IN GENERAL.—The Secretary of Energy shall provide for the upgrade to the Advanced Light 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 soft x-ray energy region.

(b) DEFINITIONS.—In this section:

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

(2) SOFT X-RAY.—The term “soft x-ray” means a photon with energy in the range from 50 to 2,000 electron 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, 2026.

(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) \$20,000,000 for fiscal year 2018;
- (2) \$50,000,000 for fiscal year 2019;
- (3) \$80,000,000 for fiscal year 2020;
- (4) \$80,000,000 for fiscal year 2021;
- (5) \$52,000,000 for fiscal year 2022;
- (6) \$22,000,000 for fiscal year 2023; and
- (7) \$6,000,000 for fiscal year 2024.

SEC. 3. LINAC COHERENT LIGHT SOURCE II HIGH ENERGY UPGRADE.

(a) IN GENERAL.—The Secretary of Energy shall provide for the upgrade to the Linac Coherent Light Source II facility 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 experimental capabilities for high energy x-rays to reveal fundamental scientific discoveries. The Secretary shall ensure the upgrade under this section enables the production and use of high energy, ultra-short pulse x-rays delivered at a high repetition rate.

(b) DEFINITIONS.—In this section:

(1) HIGH ENERGY X-RAY.—The term a “high energy x-ray” means a photon with an energy at or exceeding 12 kiloelectron volts.

(2) HIGH REPETITION RATE.—The term “high repetition rate” means the delivery of x-ray pulses up to one million pulses per second.

(3) ULTRA-SHORT PULSE X-RAYS.—The term “ultra-short pulse x-rays” means x-ray bursts capable of durations of less than one hundred femtoseconds.

(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) \$20,000,000 for fiscal year 2018;
- (2) \$55,000,000 for fiscal year 2019;
- (3) \$80,000,000 for fiscal year 2020;

(4) \$80,000,000 for fiscal year 2021;

(5) \$54,000,000 for fiscal year 2022; and

(6) \$31,000,000 for fiscal year 2023.

SEC. 4. FACILITY FOR RARE ISOTOPE BEAMS.

(a) IN GENERAL.—The Secretary of Energy shall provide for a Facility for Rare Isotope Beams to advance the understanding of rare nuclear isotopes and the evolution of the cosmos.

(b) FACILITY CAPABILITIES.—In carrying out subsection (a), the Secretary shall ensure that the user facility will provide, at a minimum, the following:

(1) A rare isotope beam facility capable of 400 kW of beam power.

(2) Scientific instruments, which may include a gamma-ray energy tracking array, a particle spectrometer with high rigidity, and a beta-decay detection system.

(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 June 30, 2022, with early operation in 2018.

(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) \$101,200,000 for fiscal year 2018;
- (2) \$86,000,000 for fiscal year 2019;
- (3) \$64,000,000 for fiscal year 2020;
- (4) \$36,300,000 for fiscal year 2021;
- (5) \$24,000,000 for fiscal year 2022;
- (6) \$15,000,000 for fiscal year 2023; and
- (7) \$15,000,000 for fiscal year 2024.

SEC. 5. 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 have 5 legislative days to revise and extend their remarks and include extraneous material on H.R. 4376, 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. 4376, the Department of Energy Research Infrastructure Act of 2018. H.R. 4376 will support the research infrastructure needed to conduct leading basic energy science and nuclear physics research initiatives here in the U.S. by authorizing upgrades in construction of major user facilities at the Department of Energy, DOE, national labs and universities.

The Advanced Light Source, ALS, at Lawrence Berkeley National Laboratory 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'

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 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, in materials, in biology, and in energy.

The Facility for Rare Isotope Beams at Michigan State University is a one-of-a-kind linear accelerator 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 even in physics.

H.R. 4376 reaffirms the Federal Government's key role in basic science research.

My home State of Texas has long been a world leader in advanced science and technology, and it is home to millions of entrepreneurs eager to take advantage of the best research facilities in the world.

These user facility upgrades will give the private sector the tools they need to develop breakthrough technologies in medicine, manufacturing, and energy. Investing in this research infrastructure will also help train the next generation of researchers in chemistry, physics, and materials science.

Here 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. This bill funds the research infrastructure necessary to make those very discoveries possible.

Mr. Speaker, I want to thank Chairman LAMAR SMITH, Representative DAN LIPINSKI, Energy Vice Chairman STEVE KNIGHT, and Representative RANDY HULTGREN for joining me as original cosponsors of this very important legislation.

Mr. Speaker, I encourage my colleagues to support this bill, and 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. 4376, the Department of Energy Research Infrastructure Act of 2018.

Mr. Speaker, the legislation includes authorizations of important upgrades to the world-class Department of Energy user facilities at Lawrence Berkeley National Laboratory and the SLAC National Accelerator Laboratory.

These upgrades will enable academic and industrial users to examine and develop advanced materials and chemical processes for a wide range of applications, from advanced batteries to high-temperature superconductors to next generations pharmaceuticals.

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This bill also directs DOE to build a new cutting-edge facility that was

competitively selected to be sited at Michigan State University. This facility will enable researchers to advance our fundamental understanding of the nature of rare nuclear isotopes, with impacts in fields ranging from nuclear astrophysics to medicine.

Our laboratories are the crown jewels of American innovation, and the user-driven science facilities at those labs and at our universities are the foundation on which our leadership in science is built.

I am very pleased to support this bipartisan effort to expand our research capabilities at DOE, and I hope this is an area in which we can continue to work together.

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

Mr. WEBER of Texas. Mr. Speaker, I yield 4 minutes to the distinguished gentleman from Texas (Mr. SMITH), who is the very honorable chairman of the Science, Space, and Technology Committee. We are going to lose Chairman SMITH, and we ought to start researching now to replace him.

Mr. SMITH of Texas. Mr. Speaker, I thank my colleague from Texas, the Energy Subcommittee chairman, for those nice comments and for yielding me time on this bill.

H.R. 4376, the Department of Energy Research Infrastructure Act, is an important piece of legislation introduced by Congressman STEVE KNIGHT from California.

The Department of Energy is the leading sponsor of basic research in the physical sciences, and DOE national labs host over 30,000 researchers each year. To maintain America's global leadership in scientific discovery, we must ensure our user facilities are the best in the world.

This bill is also cosponsored by Representative DAN LIPINSKI, Energy Subcommittee Chairman RANDY WEBER, and Representative RANDY HULTGREN, and it authorizes funding from within the DOE Office of Science's existing budget to complete construction of three science infrastructure projects.

The bill provides for upgrades to the Advanced Light Source at Lawrence Berkeley National Lab and to the Linac Coherent Light Source at the National Accelerator Laboratory at Stanford University.

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.

All together, the enhanced capabilities made possible by this bill provide significant breakthroughs in discovery science and maintain America's high-tech leadership.

I thank the Energy Subcommittee chairman and the gentleman from California (Mr. KNIGHT) for their initiatives in developing and managing this legislation, and I encourage my colleagues to support the bill.

Mr. WEBER of Texas. It is my distinct honor now to yield 2 minutes to

the gentleman from California (Mr. KNIGHT).

Mr. KNIGHT. Mr. Speaker, I rise today in support of H.R. 4376, the Department of Energy Research Infrastructure Act of 2018.

This legislation authorizes important upgrades to DOE light sources that support the research infrastructure needed to conduct leading initiatives in chemistry, physics, biology, medicine, and manufacturing. In addition, this bill authorizes a unique user facility that will allow researchers to study rare isotopes and their properties. These upgrades at DOE's best-in-the-world user facilities will facilitate discovery science and bring the best and brightest scientists in the world to the U.S.

Mr. Speaker, I want to thank Chairman SMITH and the Energy Subcommittee for introducing this important legislation.

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

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

Mr. Speaker, H.R. 4376 authorizes critical investments in research infrastructure at our national labs and universities and will ensure the next big discoveries in physical sciences, manufacturing, medicine, and energy can happen right here in these United States.

I want to thank, again, the sponsors of this bill and also thank the researchers and stakeholders that provided feedback as we developed this legislation. I certainly want to thank Congressman KNIGHT from California.

Mr. Speaker, I urge the adoption of this commonsense, 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 Texas (Mr. WEBER) that the House suspend the rules and pass the bill, H.R. 4376, 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.

BUILDING BLOCKS OF STEM ACT

Mr. KNIGHT. Mr. Speaker, I move to suspend the rules and pass the bill (H.R. 3397) to direct the National Science Foundation to support STEM education research focused on early childhood, as amended.

The Clerk read the title of the bill.

The text of the bill is as follows:

H.R. 3397

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) **DIRECTOR.**—The term "Director" means the Director of the National Science Foundation.

(2) **EARLY CHILDHOOD.**—The term "early childhood" applies to children from birth through the age of 10.

(3) **INSTITUTION OF HIGHER EDUCATION.**—The term "institution of higher education" has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(4) **LOCAL EDUCATIONAL AGENCY.**—The term "local educational agency" has the meaning given the term in section 8101 of the Elementary and Secondary Education Act of 1965 (20 USC 7801), except that such term also includes preschools, after-school programs, and summer programs.

(5) **STEM.**—The term "STEM" has the meaning given the term in section 2 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. 6621 note).

(6) **YOUNG GIRLS.**—The term "young girls" means female individuals who have not attained the age of 11.

SEC. 4. SUPPORTING STEM RESEARCH ON EARLY CHILDHOOD.

In awarding grants under the Discovery Research PreK–12 program, the Director shall consider age distribution in order to more equitably allocate funding for research studies with a focus on early childhood.

SEC. 5. SUPPORTING GIRLS IN STEM EDUCATION AND COMPUTER SCIENCE.

(a) **RESEARCH GRANTS.**—

(1) **IN GENERAL.**—The Director shall award grants, on a competitive basis, to institutions of higher education or nonprofit organizations (or consortia of such institutions or organizations), to accelerate research efforts to increase understanding of the factors that contribute to the participation of young girls in STEM activities.

(2) **RESEARCH AREAS.**—Research areas funded by a grant under this subsection may include—

(A) the role of teacher training and professional development, including effective incentive structures to encourage teachers to participate in such training and professional development, in encouraging or discouraging young girls from participating in STEM activities;

(B) the role of teachers in shaping young girls' perceptions of STEM and discouraging such girls from participating in STEM activities;

(C) the role of other facets of the learning environment on the willingness of young girls to participate in STEM activities, including learning materials and textbooks, classroom decorations, seating arrangements, use of media and technology, classroom culture, and gender composition of students during group work;

(D) the role of parents and other caregivers in encouraging or discouraging young girls from participating in STEM activities;

(E) the types of STEM activities that elicit greater participation by young girls;