

# Union Calendar No. 764

115<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

# H. R. 6229

[Report No. 115-977]

To authorize the programs of the National Institute of Standards and Technology, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

JUNE 26, 2018

Mrs. COMSTOCK (for herself, Mr. LIPINSKI, Mr. SMITH of Texas, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. MARSHALL, Mr. LUCAS, Mr. KNIGHT, Mrs. LESKO, Mr. ROHRABACHER, Mr. WEBER of Texas, and Mr. BIGGS) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

SEPTEMBER 25, 2018

Additional sponsor: Mr. BALDERSON

SEPTEMBER 25, 2018

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in *italic*]

[For text of introduced bill, see copy of bill as introduced on June 26, 2018]

# **A BILL**

To authorize the programs of the National Institute of Standards and Technology, 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 “National Institute of*  
5 *Standards and Technology Reauthorization Act of 2018”.*

6 **SEC. 2. AUTHORIZATION OF APPROPRIATIONS.**

7 *(a) FISCAL YEAR 2018.—*

8 *(1) IN GENERAL.—There are authorized to be ap-*  
9 *propriated to the Secretary of Commerce*  
10 *\$1,198,500,000 for the National Institute of Stand-*  
11 *ards and Technology for fiscal year 2018.*

12 *(2) SPECIFIC ALLOCATIONS.—Of the amount au-*  
13 *thorized by paragraph (1)—*

14 *(A) \$724,500,000 shall be for scientific and*  
15 *technical research and services laboratory activi-*  
16 *ties;*

17 *(B) \$319,000,000 shall be for the construc-*  
18 *tion and maintenance of facilities; and*

19 *(C) \$155,000,000 shall be for industrial*  
20 *technology services activities.*

21 *(b) FISCAL YEAR 2019.—*

22 *(1) IN GENERAL.—There are authorized to be ap-*  
23 *propriated to the Secretary of Commerce*  
24 *\$1,125,000,000 for the National Institute of Stand-*  
25 *ards and Technology for fiscal year 2019.*

1           (2) *SPECIFIC ALLOCATIONS.*—*Of the amount au-*  
2 *thorized by paragraph (1)—*

3           (A) *\$850,000,000 shall be for scientific and*  
4 *technical research and services laboratory activi-*  
5 *ties, 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 cyber-*  
10 *security and privacy mission area;*

11           (iii) *\$234,000,000 shall be for the fun-*  
12 *damental measurement, quantum science*  
13 *and measurement dissemination mission*  
14 *area; and*

15           (iv) *\$89,800,000 shall be for the phys-*  
16 *ical infrastructure and resilience mission*  
17 *area;*

18           (B) *\$120,000,000 shall be for the construc-*  
19 *tion and maintenance of facilities; and*

20           (C) *\$155,000,000 shall be for industrial*  
21 *technology services activities.*

22 **SEC. 3. QUANTUM INFORMATION SCIENCE.**

23           (a) *RESEARCH ACTIVITIES AND ENGAGEMENT.*—*The*  
24 *Secretary, acting through the Director, shall—*

1           (1) continue to support and expand basic quan-  
2 tum information science and technology research and  
3 development of measurement and standards infra-  
4 structure necessary to advance commercial develop-  
5 ment of quantum applications;

6           (2) use the programs of the Institute, in collabo-  
7 ration with other relevant Federal agencies, as appro-  
8 priate, to train scientists in quantum information  
9 science and technology to increase participation in  
10 the quantum fields;

11           (3) establish or expand collaborative ventures or  
12 consortia with other public or private sector entities,  
13 including other Federal agencies engaged in quantum  
14 information science research and development, insti-  
15 tutions of higher education, National Laboratories,  
16 and industry, for the purpose of advancing the field  
17 of quantum information science and engineering; and

18           (4) have the authority to enter into and perform  
19 such contracts on such terms as the Secretary, acting  
20 through the Director, considers appropriate, including  
21 cooperative research and development arrangements  
22 and grants and cooperative agreements or other trans-  
23 actions, as may be necessary in the conduct of the  
24 work of the Institute with respect to quantum infor-  
25 mation science and technology.

1       **(b) QUANTUM WORKSHOP.**—

2           **(1) IN GENERAL.**—*Not later than 1 year after*  
3 *the date of the enactment of this Act, the Secretary,*  
4 *acting through the Director, shall convene a workshop*  
5 *of stakeholders to discuss the future measurement,*  
6 *standards, cybersecurity, and other issues that relate*  
7 *to development of quantum information science in the*  
8 *United States. The goals of the workshop shall be—*

9           **(A)** *assessment of the Institute’s quantum*  
10 *information science and technology research*  
11 *work, including areas that may need additional*  
12 *Institute investment in order to support develop-*  
13 *ment of quantum information science and tech-*  
14 *nology in the United States; and*

15           **(B)** *consideration of recommendations and*  
16 *priority issues for the Institute’s participation*  
17 *in the proposed National Quantum Initiative*  
18 *Program.*

19           **(2) REPORT TO CONGRESS.**—*Not later than 2*  
20 *years after the date of enactment of this Act, the Sec-*  
21 *retary, acting through the Director, shall transmit to*  
22 *the Committee on Science, Space, and Technology and*  
23 *the Committee on Appropriations of the House of*  
24 *Representatives and the Committee on Commerce,*  
25 *Science, and Transportation and the Committee on*

1       *Appropriations of the Senate a summary report con-*  
2       *taining the findings of the workshop convened under*  
3       *this subsection.*

4       (c) *FUNDING.*—*The Secretary of Commerce shall devote*  
5       *\$80,000,000 to carry out this section for fiscal year 2019,*  
6       *subject to the availability of appropriations, to come from*  
7       *amounts made available pursuant to section 2(b)(2)(A)(iii)*  
8       *of this Act. This section shall be carried out using funds*  
9       *otherwise appropriated by law after the date of enactment*  
10      *of this Act.*

11      **SEC. 4. CYBERSECURITY.**

12      (a) *ASSISTANCE TO FEDERAL AGENCIES.*—*The Sec-*  
13      *retary, acting through the Director, shall enhance and ex-*  
14      *pand the Institute’s guidance and assistance to Federal*  
15      *agencies to help such agencies effectively use the Framework,*  
16      *including by providing technical guidance and education*  
17      *and training of—*

18              (1) *agency staff responsible for cybersecurity;*

19              *and*

20              (2) *individual inspectors general and staff of*  
21              *such agencies who are responsible for the annual inde-*  
22              *pendent evaluation required under section 3555 of*  
23              *title 44, United States Code.*

24      (b) *REPORT.*—*Not later than 12 months after the date*  
25      *of the enactment of this Act, the Secretary shall submit to*

1 *the Committee on Science, Space, and Technology of the*  
2 *House of Representatives and the Committee on Commerce,*  
3 *Science, and Transportation of the Senate a report describ-*  
4 *ing the implementation of the activities described in this*  
5 *section in as much detail as possible, including the identi-*  
6 *fication of Federal agencies assisted pursuant to subsection*  
7 *(a) and the types of consultative services, education, guid-*  
8 *ance, assistance, and training provided to such agencies*  
9 *and inspectors general of such agencies pursuant to such*  
10 *subsection.*

11 *(c) RESEARCH.—The Secretary, acting through the Di-*  
12 *rector, shall expand the fundamental and applied research*  
13 *carried out by the Institute to address key questions relating*  
14 *the measurement of privacy, security, and vulnerability of*  
15 *software tools and communications networks, including*  
16 *through—*

17 *(1) the development of research and engineering*  
18 *capabilities to provide practical solutions, including*  
19 *measurement techniques and engineering toolkits, to*  
20 *solve cybersecurity challenges such as human factors,*  
21 *identity management, network security, privacy, and*  
22 *software;*

23 *(2) investment in tools to help private and pub-*  
24 *lic sector organizations measure their cybersecurity,*



1        *manage their risks and ensure workforce preparedness*  
2        *for new cybersecurity challenges; and*

3            (3) *investment in programs to prepare the*  
4        *United States with strong cybersecurity and*  
5        *encryption technologies to apply to emerging tech-*  
6        *nologies such as artificial intelligence, the internet of*  
7        *things, and quantum computing.*

8        (d) *AUTHORITY.—The Secretary, acting through the*  
9        *Director, shall have the authority to enter into and perform*  
10       *such contracts on such terms as the Secretary considers to*  
11       *be appropriate, including cooperative research and develop-*  
12       *ment arrangements, grants, and cooperative agreements or*  
13       *other transactions, as may be necessary in the conduct of*  
14       *the work of the Institute with respect to cybersecurity.*

15       **SEC. 5. COMPOSITES RESEARCH.**

16       (a) *RESEARCH.—The Secretary, acting through the*  
17       *Director, shall implement the recommendations contained*  
18       *in the December 2017 report entitled “Road Mapping Work-*  
19       *shop Report on Overcoming Barriers to Adoption of Com-*  
20       *posites in Sustainable Infrastructure”, as appropriate, to*  
21       *help facilitate the adoption of composite technology in in-*  
22       *frastructure in the United States. In implementing such*  
23       *recommendations, the Secretary, acting through the Direc-*  
24       *tor shall, with respect to the use of composite technology*  
25       *in infrastructure—*

1           (1) *not later than 6 months after the date of en-*  
2           *actment of this Act, establish a design data clearing-*  
3           *house to identify, gather, validate, and disseminate*  
4           *existing design criteria, tools, guidelines, and stand-*  
5           *ards; and*

6           (2) *develop methods and resources required for*  
7           *testing an evaluation of safe and appropriate uses of*  
8           *composite materials for infrastructure, including—*

9                   (A) *conditioning protocols, procedures and*  
10                  *models;*

11                   (B) *screening and acceptance tools; and*

12                   (C) *minimum allowable design data sets*  
13                  *that can be converted into design tools.*

14           (b) *STANDARDS COORDINATION.—The Secretary, act-*  
15           *ing through the Director, shall assure that the appropriate*  
16           *Institute staff consult regularly with standards developers,*  
17           *members of the composites industry, institutions of higher*  
18           *education, and other stakeholders in order to facilitate the*  
19           *adoption of standards for use of composite materials in in-*  
20           *frastructure that are based on the research and testing re-*  
21           *sults and other information developed by the Institute.*

22           (c) *FUNDING.—The Secretary of Commerce shall devote*  
23           *\$11,000,000 to carry out this section for fiscal year 2019,*  
24           *subject to the availability of appropriations, to come from*  
25           *amounts made available pursuant to section 2(b)(2)(A)(iv)*

1 *of this Act. This section shall be carried out using funds*  
2 *otherwise appropriated by law after the date of enactment*  
3 *of this Act.*

4 **SEC. 6. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE.**

5 *The Secretary, acting through the Director, shall con-*  
6 *tinue to support the development of artificial intelligence*  
7 *and data science, including through—*

8 *(1) the expansion of the Institute’s capabilities,*  
9 *including scientific staff and research infrastructure;*

10 *(2) the implementation of rigorous scientific test-*  
11 *ing to support the development of trustworthy and*  
12 *safe artificial intelligence and data systems; and*

13 *(3) the development of machine learning and*  
14 *other artificial intelligence applications to support*  
15 *measurement science research programs and take*  
16 *steps to modernize the Institute’s research infrastruc-*  
17 *ture.*

18 **SEC. 7. INTERNET OF THINGS.**

19 *The Secretary, acting through the Director, shall con-*  
20 *tinue to conduct research with respect to and support the*  
21 *expanded connectivity, interoperability, and security of*  
22 *interconnected systems and other aspects of the internet of*  
23 *things, including through—*

24 *(1) the development of new tools and methodolo-*  
25 *gies for cybersecurity of the internet of things;*

1           (2) *the development of technologies to address*  
2 *network congestion and device interference, such as*  
3 *the development of testing tools for next generation*  
4 *wireless communications, internet of things protocols,*  
5 *coexistence of wireless communications systems, and*  
6 *spectrum sharing;*

7           (3) *convening experts in the public and private*  
8 *sectors to develop recommendations for accelerating*  
9 *the adoption of sound interoperability standards,*  
10 *guidelines, and best practices for the internet of*  
11 *things; and*

12           (4) *the development and publication of new cy-*  
13 *bersecurity tools, encryption methods, and best prac-*  
14 *tices for internet of things security.*

15 **SEC. 8. HIRING AND MANAGEMENT.**

16           (a) *APPOINTMENTS.*—*The Secretary, acting through*  
17 *the Director shall have the authority to—*

18           (1) *make appointments of scientific, engineering,*  
19 *and professional personnel without regard to the civil*  
20 *service laws as the Secretary, acting through the Di-*  
21 *rector determines necessary for carrying out research*  
22 *and development functions which require the services*  
23 *of specially qualified personnel relating to cybersecu-*  
24 *rity and quantum information science and technology*  
25 *and such other areas of national research priorities as*

1 *the Secretary, acting through the Director may deter-*  
2 *mine; and*

3 *(2) fix the basic pay of such personnel at a rate*  
4 *to be determined by the Secretary, acting through the*  
5 *Director at rates not in excess of the basic rate of pay*  
6 *of the Vice President under section 104 of title 3,*  
7 *United States Code, without regard to the civil service*  
8 *laws.*

9 *(b) LIMITATION.—The Director may appoint not more*  
10 *than 10 individuals under this section.*

11 **SEC. 9. DEFINITIONS.**

12 *In this Act:*

13 *(1) The term “Director” means the Director of*  
14 *the National Institute of Standards and Technology.*

15 *(2) The term “Framework” means the Frame-*  
16 *work for Improving Critical Infrastructure Cybersecu-*  
17 *rity developed by the National Institute of Standards*  
18 *and Technology and referred to in Executive Order*  
19 *13800 issued on May 11, 2017 (82 Fed. Reg. 22391*  
20 *et seq.).*

21 *(3) The term “Institute” means the National In-*  
22 *stitute of Standards and Technology.*

23 *(4) The term “institution of higher education”*  
24 *has the meaning given such term in section 101 of the*  
25 *Higher Education Act of 1965 (20 U.S.C. 1001).*

1           (5) *The term “Secretary” means the Secretary of*  
2           *Commerce.*



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115<sup>TH</sup> CONGRESS  
2D Session

**H. R. 6229**

[Report No. 115-977]

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## **A BILL**

To authorize the programs of the National Institute of Standards and Technology, and for other purposes.

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SEPTEMBER 25, 2018

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed