

114TH CONGRESS  
2D SESSION

# H. R. 6490

To invest in innovation through research and development, and to improve  
the competitiveness of the United States.

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## IN THE HOUSE OF REPRESENTATIVES

DECEMBER 8, 2016

Mr. SMITH of Texas introduced the following bill; which was referred to the Committee on Science, Space, and Technology, and in addition to the Committees on Oversight and Government Reform, and Education and the Workforce, 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 invest in innovation through research and development,  
and to improve the competitiveness of the United States.

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 (a) SHORT TITLE.—This Act may be cited as the  
5 “American Innovation and Competitiveness Act”.

6 (b) TABLE OF CONTENTS.—The table of contents of  
7 this Act is as follows:

Sec. 1. Short title; table of contents.

Sec. 2. Definitions.

## TITLE I—MAXIMIZING BASIC RESEARCH

- Sec. 101. Reaffirmation of merit-based peer review.
- Sec. 102. Transparency and accountability.
- Sec. 103. EPSCoR reaffirmation and update.
- Sec. 104. Cybersecurity research.
- Sec. 105. Networking and Information Technology Research and Development Update.
- Sec. 106. Physical sciences coordination.
- Sec. 107. Laboratory program improvements.
- Sec. 108. Standard Reference Data Act update.
- Sec. 109. NSF mid-scale project investments.
- Sec. 110. Oversight of NSF major multi-user research facility projects.
- Sec. 111. Personnel oversight.
- Sec. 112. Management of the U.S. Antarctic Program.
- Sec. 113. NIST campus security.
- Sec. 114. Coordination of sustainable chemistry research and development.
- Sec. 115. Misrepresentation of research results.
- Sec. 116. Research reproducibility and replication.
- Sec. 117. Brain Research through Advancing Innovative Neurotechnologies Initiative.

TITLE II—ADMINISTRATIVE AND REGULATORY BURDEN  
REDUCTION

- Sec. 201. Interagency working group on research regulation.
- Sec. 202. Scientific and technical collaboration.
- Sec. 203. NIST grants and cooperative agreements update.
- Sec. 204. Repeal of certain obsolete reports.
- Sec. 205. Repeal of certain provisions.
- Sec. 206. Grant subrecipient transparency and oversight.
- Sec. 207. Micro-purchase threshold for procurement solicitations by research institutions.
- Sec. 208. Coordination of international science and technology partnerships.

TITLE III—SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH  
EDUCATION

- Sec. 301. Robert Noyce Teacher Scholarship Program update.
- Sec. 302. Space grants.
- Sec. 303. STEM Education Advisory Panel.
- Sec. 304. Committee on STEM Education.
- Sec. 305. Programs to expand STEM opportunities.
- Sec. 306. NIST education and outreach.
- Sec. 307. Presidential awards for excellence in STEM mentoring.
- Sec. 308. Working group on inclusion in STEM fields.
- Sec. 309. Improving undergraduate STEM experiences.
- Sec. 310. Computer science education research.
- Sec. 311. Informal STEM education.
- Sec. 312. Developing STEM apprenticeships.
- Sec. 313. NSF report on broadening participation.
- Sec. 314. NOAA science education programs.
- Sec. 315. Hispanic-serving institutions undergraduate program update.

## TITLE IV—LEVERAGING THE PRIVATE SECTOR

- Sec. 401. Prize competition authority update.

- Sec. 402. Crowdsourcing and citizen science.  
 Sec. 403. NIST director functions update.  
 Sec. 404. NIST Visiting Committee on Advanced Technology update.

TITLE V—MANUFACTURING

- Sec. 501. Hollings Manufacturing Extension Partnership improvements.

TITLE VI—INNOVATION AND TECHNOLOGY TRANSFER

- Sec. 601. Innovation Corps.  
 Sec. 602. Translational research grants.  
 Sec. 603. Optics and photonics technology innovations.  
 Sec. 604. United States Chief Technology Officer.  
 Sec. 605. National Research Council study on technology for emergency notifications on campuses.

1 **SEC. 2. DEFINITIONS.**

2 In this Act, unless expressly provided otherwise:

3 (1) **APPROPRIATE COMMITTEES OF CON-**  
 4 **GRESS.**—The term “appropriate committees of Con-  
 5 gress” means the Committee on Commerce, Science,  
 6 and Transportation of the Senate and the Com-  
 7 mittee on Science, Space, and Technology of the  
 8 House of Representatives.

9 (2) **FEDERAL SCIENCE AGENCY.**—The term  
 10 “Federal science agency” has the meaning given the  
 11 term in section 103 of the America COMPETES  
 12 Reauthorization Act of 2010 (42 U.S.C. 6623).

13 (3) **FOUNDATION.**—The term “Foundation”  
 14 means the National Science Foundation.

15 (4) **INSTITUTION OF HIGHER EDUCATION.**—The  
 16 term “institution of higher education” has the  
 17 meaning given the term in section 101(a) of the  
 18 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

1           (5) NIST.—The term “NIST” means the Na-  
2           tional Institute of Standards and Technology.

3           (6) STEM.—The term “STEM” has the mean-  
4           ing given the term in section 2 of the America COM-  
5           PETES Reauthorization Act of 2010 (42 U.S.C.  
6           6621 note).

7           (7) STEM EDUCATION.—The term “STEM  
8           education” has the meaning given the term in sec-  
9           tion 2 of the STEM Education Act of 2015 (42  
10          U.S.C. 6621 note).

11           **TITLE I—MAXIMIZING BASIC**  
12           **RESEARCH**

13           **SEC. 101. REAFFIRMATION OF MERIT-BASED PEER REVIEW.**

14           (a) SENSE OF CONGRESS.—It is the sense of Con-  
15          gress that—

16           (1) sustained, predictable Federal funding of  
17          basic research is essential to United States leader-  
18          ship in science and technology;

19           (2) the Foundation’s intellectual merit and  
20          broader impacts criteria are appropriate for evalu-  
21          ating grant proposals, as concluded by the 2011 Na-  
22          tional Science Board Task Force on Merit Review;

23           (3) evaluating proposals on the basis of the  
24          Foundation’s intellectual merit and broader impacts  
25          criteria should be used to assure that the Founda-

1       tion’s activities are in the national interest as these  
2       reviews can affirm that—

3               (A) the proposals funded by the Founda-  
4               tion are of high quality and advance scientific  
5               knowledge; and

6               (B) the Foundation’s grants address soci-  
7               etal needs through basic research findings or  
8               through related activities; and

9               (4) as evidenced by the Foundation’s contribu-  
10              tions to scientific advancement, economic growth,  
11              human health, and national security, its peer review  
12              and merit review processes have identified and fund-  
13              ed scientifically and societally relevant basic research  
14              and should be preserved.

15       (b) MERIT REVIEW CRITERIA.—The Foundation  
16       shall maintain the intellectual merit and broader impacts  
17       criteria, among other specific criteria as appropriate, as  
18       the basis for evaluating grant proposals in the merit re-  
19       view process.

20       (c) UPDATES.—If after the date of enactment of this  
21       Act a change is made to the merit review process, the Di-  
22       rector shall submit a report to the appropriate committees  
23       of Congress not later than 30 days after the date of the  
24       change.

1 **SEC. 102. TRANSPARENCY AND ACCOUNTABILITY.**

2 (a) FINDINGS.—

3 (1) Building the understanding of and con-  
4 fidence in investments in basic research is essential  
5 to public support for sustained, predictable Federal  
6 funding.

7 (2) The Foundation has improved transparency  
8 and accountability of the outcomes made through  
9 the merit review process, but additional trans-  
10 parency into individual grants is valuable in commu-  
11 nicating and assuring the public value of federally  
12 funded research.

13 (3) The Foundation should commit to trans-  
14 parency and accountability and to clear, consistent  
15 public communication regarding the national interest  
16 for each Foundation-awarded grant and cooperative  
17 agreement.

18 (b) GUIDANCE.—

19 (1) IN GENERAL.—The Director of the Founda-  
20 tion shall issue and periodically update, as appro-  
21 priate, policy guidance for both Foundation staff  
22 and other Foundation merit review process partici-  
23 pants on the importance of transparency and ac-  
24 countability to the outcomes made through the merit  
25 review process.

1           (2) REQUIREMENTS.—The guidance under  
2 paragraph (1) shall require that each public notice  
3 of a Foundation-funded research project justify the  
4 expenditure of Federal funds by—

5           (A) describing how the project—

6           (i) reflects the statutory mission of  
7 the Foundation, as established in the Na-  
8 tional Science Foundation Act of 1950 (42  
9 U.S.C. 1861 et seq.); and

10          (ii) addresses the Foundation’s intel-  
11 lectual merit and broader impacts criteria;  
12 and

13          (B) clearly identifying the research goals  
14 of the project in a manner that can be easily  
15 understood by both technical and nontechnical  
16 audiences.

17          (c) BROADER IMPACTS REVIEW CRITERION UP-  
18 DATE.—Section 526(a) of the America COMPETES Re-  
19 authorization Act of 2010 (42 U.S.C. 1862p–14(a)) is  
20 amended to read as follows:

21          “(a) GOALS.—The Foundation shall apply a broader  
22 impacts review criterion to identify and demonstrate  
23 project support of the following goals:

24           “(1) Increasing the economic competitiveness of  
25 the United States.

1           “(2) Advancing of the health and welfare of the  
2 American public.

3           “(3) Supporting the national defense of the  
4 United States.

5           “(4) Enhancing partnerships between academia  
6 and industry in the United States.

7           “(5) Developing an American STEM workforce  
8 that is globally competitive through improved pre-  
9 kindergarten through grade 12 STEM education,  
10 and teacher development and improved under-  
11 graduate STEM education and instruction.

12           “(6) Improving public scientific literacy and en-  
13 gagement with science and technology in the United  
14 States.

15           “(7) Expanding participation of women and in-  
16 dividuals from underrepresented groups in STEM.”.

17 **SEC. 103. EPSCOR REAFFIRMATION AND UPDATE.**

18           (a) FINDINGS.—Section 517(a) of the America COM-  
19 PETES Reauthorization Act of 2010 (42 U.S.C. 1862p-  
20 9(a)) is amended—

21           (1) in paragraph (1)—

22           (A) by striking “The National” and insert-  
23 ing “the National”; and

24           (B) by striking “education,” and inserting  
25 “education”;



1           (2) in paragraph (2), by striking “with 27  
2           States” and all that follows through the semicolon at  
3           the end and inserting “with 28 States and jurisdic-  
4           tions, taken together, receiving only about 12 per-  
5           cent of all National Science Foundation research  
6           funding;”;

7           (3) by striking paragraph (3) and inserting the  
8           following:

9           “(3) each of the States described in paragraph  
10          (2) receives only a fraction of 1 percent of the Foun-  
11          dation’s research dollars each year;”;

12          (4) by adding at the end the following:

13          “(4) first established at the National Science  
14          Foundation in 1979, the Experimental Program to  
15          Stimulate Competitive Research (referred to in this  
16          section as ‘EPSCoR’) assists States and jurisdic-  
17          tions historically underserved by Federal research  
18          and development funding in strengthening their re-  
19          search and innovation capabilities;

20          “(5) the EPSCoR structure requires each par-  
21          ticipating State to develop a science and technology  
22          plan suited to State and local research, education,  
23          and economic interests and objectives;

24          “(6) EPSCoR has been credited with advancing  
25          the research competitiveness of participating States,

1 improving awareness of science, promoting policies  
2 that link scientific investment and economic growth,  
3 and encouraging partnerships between government,  
4 industry, and academia;

5 “(7) EPSCoR proposals are evaluated through  
6 a rigorous and competitive merit review process to  
7 ensure that awarded research and development ef-  
8 forts meet high scientific standards; and

9 “(8) according to the National Academy of  
10 Sciences, EPSCoR has strengthened the national re-  
11 search infrastructure and enhanced the educational  
12 opportunities needed to develop the science and engi-  
13 neering workforce.”.

14 (b) SENSE OF CONGRESS.—

15 (1) IN GENERAL.—It is the sense of Congress  
16 that—

17 (A) since maintaining the Nation’s sci-  
18 entific and economic leadership requires the  
19 participation of talented individuals nationwide,  
20 EPSCoR investments into State research and  
21 education capacities are in the Federal interest  
22 and should be sustained; and

23 (B) EPSCoR should maintain its experi-  
24 mental component by supporting innovative

1 methods for improving research capacity and  
2 competitiveness.

3 (2) DEFINITION OF EPSCoR.—In this sub-  
4 section, the term “EPSCoR” has the meaning given  
5 the term in section 502 of the America COMPETES  
6 Reauthorization Act of 2010 (42 U.S.C. 1862p  
7 note).

8 (c) AWARD STRUCTURE UPDATES.—Section 517 of  
9 the America COMPETES Reauthorization Act of 2010  
10 (42 U.S.C. 1862p–9) is amended by adding at the end  
11 the following:

12 “(g) AWARD STRUCTURE UPDATES.—In imple-  
13 menting the mandate to maximize the impact of Federal  
14 EPSCoR support on building competitive research infra-  
15 structure, and based on the inputs and recommendations  
16 of previous EPSCoR reviews, the head of each Federal  
17 agency administering an EPSCoR program shall—

18 “(1) consider modifications to EPSCoR pro-  
19 posal solicitation, award type, and project evalua-  
20 tion—

21 “(A) to more closely align with current  
22 agency priorities and initiatives;

23 “(B) to focus EPSCoR funding on achiev-  
24 ing critical scientific, infrastructure, and edu-  
25 cational needs of that agency;

1           “(C) to encourage collaboration between  
2           EPSCoR-eligible institutions and researchers,  
3           including with institutions and researchers in  
4           other States and jurisdictions;

5           “(D) to improve communication between  
6           State and Federal agency proposal reviewers;  
7           and

8           “(E) to continue to reduce administrative  
9           burdens associated with EPSCoR;

10          “(2) consider modifications to EPSCoR award  
11          structures—

12                 “(A) to emphasize long-term investments  
13                 in building research capacity, potentially  
14                 through the use of larger, renewable funding  
15                 opportunities; and

16                 “(B) to allow the agency, States, and juris-  
17                 dictions to experiment with new research and  
18                 development funding models; and

19          “(3) consider modifications to the mechanisms  
20          used to monitor and evaluate EPSCoR awards—

21                 “(A) to increase collaboration between  
22                 EPSCoR-funded researchers and agency staff,  
23                 including by providing opportunities for men-  
24                 toring young researchers and for the use of  
25                 Federal facilities;

1           “(B) to identify and disseminate best prac-  
2           tices; and

3           “(C) to harmonize metrics across partici-  
4           pating Federal agencies, as appropriate.”.

5           (d) REPORTS.—

6           (1) CONGRESSIONAL REPORTS.—Section 517 of  
7           the America COMPETES Reauthorization Act of  
8           2010 (42 U.S.C. 1862p–9), as amended, is further  
9           amended—

10           (A) by striking subsection (c);

11           (B) by redesignating subsections (d)  
12           through (g) as subsections (c) through (f), re-  
13           spectively;

14           (C) in subsection (c), as redesignated—

15           (i) in paragraph (1), by striking “Ex-  
16           perimental Programs to Stimulate Com-  
17           petitive Research” and inserting  
18           “EPSCoR”; and

19           (ii) in paragraph (2)—

20           (I) in subparagraphs (A) and  
21           (E), by striking “EPSCoR and Fed-  
22           eral EPSCoR-like programs” and in-  
23           serting “each EPSCoR”;

24           (II) in subparagraph (D), by  
25           striking “EPSCoR and other Federal

1 EPSCoR-like programs” and inserting  
2 “each EPSCoR”;

3 (III) in subparagraph (E), by  
4 striking “EPSCoR or Federal  
5 EPSCoR-like programs” and inserting  
6 “each EPSCoR”; and

7 (IV) in subparagraph (G), by  
8 striking “EPSCoR programs” and in-  
9 serting “each EPSCoR”;

10 (D) by amending subsection (d), as reded-  
11 icated, to read as follows:

12 “(d) FEDERAL AGENCY REPORTS.—Each Federal  
13 agency that administers an EPSCoR shall submit to Con-  
14 gress, as part of its Federal budget submission—

15 “(1) a description of the program strategy and  
16 objectives;

17 “(2) a description of the awards made in the  
18 previous fiscal year, including—

19 “(A) the total amount made available, by  
20 State, under EPSCoR;

21 “(B) the total amount of agency funding  
22 made available to all institutions and entities  
23 within each EPSCoR State;

1           “(C) the efforts and accomplishments to  
2           more fully integrate the EPSCoR States in  
3           major agency activities and initiatives;

4           “(D) the percentage of EPSCoR reviewers  
5           from EPSCoR States; and

6           “(E) the number of programs or large col-  
7           laborator awards involving a partnership of or-  
8           ganizations and institutions from EPSCoR and  
9           non-EPSCoR States; and

10          “(3) an analysis of the gains in academic re-  
11          search quality and competitiveness, and in science  
12          and technology human resource development,  
13          achieved by the program over the last 5 fiscal  
14          years.”; and

15                 (E) in subsection (e)(1), as redesignated,  
16                 by striking “Experimental Program to Stimu-  
17                 late Competitive Research or a program similar  
18                 to the Experimental Program to Stimulate  
19                 Competitive Research” and inserting  
20                 “EPSCoR”.

21          (2) RESULTS OF AWARD STRUCTURE PLAN.—  
22          Not later than 1 year after the date of enactment  
23          of this Act, the EPSCoR Interagency Coordinating  
24          Committee shall brief the appropriate committees of  
25          Congress on the updates made to the award struc-

1       ture under 517(f) of the America COMPETES Re-  
2       authorization Act of 2010 (42 U.S.C. 1862p–9(f)),  
3       as amended by this subsection.

4       (e) DEFINITION OF EPSCoR.—

5           (1) IN GENERAL.—Section 502 of the America  
6       COMPETES Reauthorization Act of 2010 (42  
7       U.S.C. 1862p note) is amended by amending para-  
8       graph (2) to read as follows:

9           “(2) EPSCoR.—The term ‘EPSCoR’ means—

10           “(A) the Established Program to Stimulate  
11           Competitive Research established by the Foun-  
12           dation; or

13           “(B) a program similar to the Established  
14           Program to Stimulate Competitive Research at  
15           another Federal agency.”.

16           (2) TECHNICAL AND CONFORMING AMEND-  
17       MENTS.—Section 113 of the National Science Foun-  
18       dation Authorization Act of 1988 (42 U.S.C. 1862g)  
19       is amended—

20           (A) in the heading, by striking “**EXPERI-**  
21           **MENTAL**” and inserting “**ESTABLISHED**”;

22           (B) in subsection (a), by striking “an Ex-  
23           perimental Program to Stimulate Competitive  
24           Research” and inserting “a program to stimu-  
25           late competitive research (known as the ‘Estab-



1           lished Program to Stimulate Competitive Re-  
2           search’”); and

3                   (C) in subsection (b), by striking “the pro-  
4           gram” and inserting “the Program”.

5 **SEC. 104. CYBERSECURITY RESEARCH.**

6           (a) FOUNDATION CYBERSECURITY RESEARCH.—Sec-  
7           tion 4(a)(1) of the Cyber Security Research and Develop-  
8           ment Act, as amended (15 U.S.C. 7403(a)(1)) is amend-  
9           ed—

10                   (1) in subparagraph (O), by striking “and” at  
11           the end;

12                   (2) in subparagraph (P), by striking the period  
13           at the end and inserting a semicolon; and

14                   (3) by adding at the end the following:

15                           “(Q) security of election-dedicated voting  
16                           system software and hardware; and

17                           “(R) role of the human factor in cyberse-  
18                           curity and the interplay of computers and hu-  
19                           mans and the physical world.”.

20           (b) NIST CYBERSECURITY PRIORITIES.—

21                   (1) CRITICAL INFRASTRUCTURE AWARENESS.—

22           The Director of NIST shall continue to raise public  
23           awareness of the voluntary, industry-led cybersecu-  
24           rity standards and best practices for critical infra-  
25           structure developed under section 2(c)(15) of the

1 National Institute of Standards and Technology Act  
2 (15 U.S.C. 272(e)(15)).

3 (2) QUANTUM COMPUTING.—Under section 2(b)  
4 of the National Institute of Standards and Tech-  
5 nology Act (15 U.S.C. 272(b)) and section 20 of  
6 that Act (15 U.S.C. 278g–3), the Director of NIST  
7 shall—

8 (A) research information systems for fu-  
9 ture cybersecurity needs; and

10 (B) coordinate with relevant stakeholders  
11 to develop a process—

12 (i) to research and identify or, if nec-  
13 essary, develop cryptography standards  
14 and guidelines for future cybersecurity  
15 needs, including quantum-resistant cryp-  
16 tography standards; and

17 (ii) to provide recommendations to  
18 Congress, Federal agencies, and industry  
19 consistent with the National Technology  
20 Transfer and Advancement Act of 1995  
21 (Public Law 104–113; 110 Stat. 775), for  
22 a secure and smooth transition to the  
23 standards under clause (i).

24 (3) FEDERAL INFORMATION SYSTEMS RE-  
25 SEARCH AND DEVELOPMENT.—Section 20(d)(3) of

1 the National Institute of Standards and Technology  
2 Act (15 U.S.C. 278g-3(d)(3)) is amended to read as  
3 follows:

4 “(3) conduct research and analysis—

5 “(A) to determine the nature and extent of  
6 information security vulnerabilities and tech-  
7 niques for providing cost-effective information  
8 security;

9 “(B) to review and determine prevalent in-  
10 formation security challenges and deficiencies  
11 identified by agencies or the Institute, including  
12 any challenges or deficiencies described in any  
13 of the annual reports under section 3553 or  
14 3554 of title 44, United States Code, and in  
15 any of the reports and the independent evalua-  
16 tions under section 3555 of that title, that may  
17 undermine the effectiveness of agency informa-  
18 tion security programs and practices; and

19 “(C) to evaluate the effectiveness and suf-  
20 ficiency of, and challenges to, Federal agencies’  
21 implementation of standards and guidelines de-  
22 veloped under this section and policies and  
23 standards promulgated under section 11331 of  
24 title 40, United States Code;”.

1           (4) VOTING.—Section 2(c) of the National In-  
2           stitute of Standards and Technology Act (15 U.S.C.  
3           272(c)) is amended—

4                   (A) by redesignating paragraphs (16)  
5                   through (23) as paragraphs (17) through (24),  
6                   respectively; and

7                   (B) by inserting after paragraph (15) the  
8                   following:

9                   “(16) perform research to support the develop-  
10                  ment of voluntary, consensus-based, industry-led  
11                  standards and recommendations on the security of  
12                  computers, computer networks, and computer data  
13                  storage used in election systems to ensure voters can  
14                  vote securely and privately.”.

15   **SEC. 105. NETWORKING AND INFORMATION TECHNOLOGY**  
16                   **RESEARCH AND DEVELOPMENT UPDATE.**

17           (a) SHORT TITLE.—This section may be cited as the  
18           “Networking and Information Technology Research and  
19           Development Modernization Act of 2016”.

20           (b) FINDINGS.—Section 2 of the High-Performance  
21           Computing Act of 1991 (15 U.S.C. 5501) is amended—

22                   (1) in paragraphs (2) and (5), by striking  
23                   “high-performance computing” and inserting “net-  
24                   working and information technology, including high-  
25                   performance computing,”; and

1           (2) in paragraph (3), by striking “high-per-  
2           formance computing” and inserting “networking and  
3           information technology, including high-performance  
4           computing”.

5           (c) PURPOSES.—Section 3 of the High-Performance  
6 Computing Act of 1991 (15 U.S.C. 5502) is amended—

7           (1) in the matter preceding paragraph (1), by  
8           striking “high-performance computing” and insert-  
9           ing “networking and information technology”;

10          (2) in paragraph (1)—

11           (A) in the matter preceding subparagraph  
12           (A), by striking “expanding Federal support for  
13           research, development, and application of high-  
14           performance computing” and inserting “sup-  
15           porting Federal research, development, and ap-  
16           plication of networking and information tech-  
17           nology”;

18           (B) in subparagraph (A), by striking  
19           “high-performance computing” both places it  
20           appears and inserting “networking and infor-  
21           mation technology”;

22           (C) by striking subparagraphs (C) and  
23           (D);

24           (D) by inserting after subparagraph (B)  
25           the following:

1           “(C) stimulate research on and promote  
2 more rapid development of high-end computing  
3 systems software and applications software;”;

4           (E) by redesignating subparagraphs (E)  
5 through (H) as subparagraphs (D) through  
6 (G), respectively;

7           (F) in subparagraph (D), as redesignated,  
8 by inserting “high-end” after “the development  
9 of”;

10          (G) in subparagraphs (E) and (F), as re-  
11 designated, by striking “high-performance com-  
12 puting” each place it appears and inserting  
13 “networking and information technology”; and

14          (H) in subparagraph (G), as redesignated,  
15 by striking “high-performance” and inserting  
16 “high-end”; and

17 (3) in paragraph (2)—

18          (A) by striking “high-performance com-  
19 puting and” and inserting “networking and in-  
20 formation technology and”; and

21          (B) by striking “high-performance com-  
22 puting network” and inserting “networking and  
23 information technology”.

1 (d) DEFINITIONS.—Section 4 of the High-Perform-  
2 ance Computing Act of 1991 (15 U.S.C. 5503) is amend-  
3 ed—

4 (1) by striking paragraphs (3) and (5);

5 (2) by redesignating paragraphs (1), (2), (4),  
6 (6), and (7) as paragraphs (2), (3), (5), (8), and  
7 (9), respectively;

8 (3) by inserting before paragraph (2), as redes-  
9 ignated, the following:

10 “(1) ‘cyber-physical systems’ means physical or  
11 engineered systems whose networking and informa-  
12 tion technology functions and physical elements are  
13 deeply integrated and are actively connected to the  
14 physical world through sensors, actuators, or other  
15 means to enable safe and effective, real-time per-  
16 formance in safety-critical and other applications;”;

17 (4) in paragraph (3), as redesignated, by strik-  
18 ing “high-performance computing” and inserting  
19 “networking and information technology”;

20 (5) by inserting after paragraph (3), as redesign-  
21 nated, the following:

22 “(4) ‘high-end computing’ means the most ad-  
23 vanced and capable computing systems, including  
24 their hardware, storage, networking and software,  
25 encompassing both massive computational capability

1 and large-scale data analytics to solve computational  
2 problems of national importance that are beyond the  
3 capability of small- to medium-scale systems, includ-  
4 ing computing formerly known as high-performance  
5 computing;”;

6 (6) by inserting after paragraph (5), as redesign-  
7 nated, the following:

8 “(6) ‘networking and information technology’  
9 means high-end computing, communications, and in-  
10 formation technologies, high-capacity and high-speed  
11 networks, special purpose and experimental systems,  
12 high-end computing systems software and applica-  
13 tions software, and the management of large data  
14 sets;

15 “(7) ‘participating agency’ means an agency de-  
16 scribed in section 101(a)(3)(C);” and

17 (7) in paragraph (8), as redesignated, by strik-  
18 ing “National High-Performance Computing Pro-  
19 gram” and inserting “Networking and Information  
20 Technology Research and Development Program”.

21 (e) TITLE I HEADING.—The heading of title I of the  
22 High-Performance Computing Act of 1991 (15 U.S.C.  
23 5511 et seq.) is amended by striking “**HIGH-PER-**  
24 **FORMANCE COMPUTING**” and inserting “**NET-**



1 **WORKING AND INFORMATION TECH-**  
2 **NOLOGY**”.

3 (f) NETWORKING AND INFORMATION TECHNOLOGY  
4 RESEARCH AND DEVELOPMENT PROGRAM.—Section 101  
5 of the High-Performance Computing Act of 1991 (15  
6 U.S.C. 5511) is amended—

7 (1) in the section heading, by striking “**NA-**  
8 **TIONAL HIGH-PERFORMANCE COMPUTING**  
9 **PROGRAM**” and inserting “**NETWORKING AND**  
10 **INFORMATION TECHNOLOGY RESEARCH AND**  
11 **DEVELOPMENT PROGRAM**”;

12 (2) in subsection (a)—

13 (A) in the subsection heading, by striking  
14 “**NATIONAL HIGH-PERFORMANCE COMPUTING**  
15 **PROGRAM**” and inserting “**NETWORKING AND**  
16 **INFORMATION TECHNOLOGY RESEARCH AND**  
17 **DEVELOPMENT**”;

18 (B) in paragraph (1)—

19 (i) in the matter preceding subpara-  
20 graph (A), by striking “**National High-Per-**  
21 **formance Computing Program**” and insert-  
22 ing “**Networking and Information Tech-**  
23 **nology Research and Development Pro-**  
24 **gram**”;

1 (ii) in subparagraph (A), by striking  
2 “high-performance computing, including  
3 networking” and inserting “networking  
4 and information technology”;

5 (iii) in subparagraphs (B) and (G), by  
6 striking “high-performance” each place it  
7 appears and inserting “high-end”;

8 (iv) in subparagraph (C), by striking  
9 “high-performance computing and net-  
10 working” and inserting “high-end com-  
11 puting, distributed, and networking”;

12 (v) by amending subparagraph (D) to  
13 read as follows:

14 “(D) provide for efforts to increase soft-  
15 ware security and reliability;”;

16 (vi) in subparagraph (H)—

17 (I) by inserting “support and  
18 guidance” after “provide”; and

19 (II) by striking “and” after the  
20 semicolon;

21 (vii) in subparagraph (I)—

22 (I) by striking “improving the se-  
23 curity” and inserting “improving the  
24 security, reliability, and resilience”;  
25 and

1 (II) by striking the period at the  
2 end and inserting a semicolon; and  
3 (viii) by adding at the end the fol-  
4 lowing:

5 “(J) provide for increased understanding  
6 of the scientific principles of cyber-physical sys-  
7 tems and improve the methods available for the  
8 design, development, and operation of cyber-  
9 physical systems that are characterized by high  
10 reliability, safety, and security;

11 “(K) provide for research and development  
12 on human-computer interactions, visualization,  
13 and big data;

14 “(L) provide for research and development  
15 on the enhancement of cybersecurity, including  
16 the human facets of cyber threats and secure  
17 cyber systems;

18 “(M) provide for the understanding of the  
19 science, engineering, policy, and privacy protec-  
20 tion related to networking and information  
21 technology;

22 “(N) provide for the transition of high-end  
23 computing hardware, system software, develop-  
24 ment tools, and applications into development  
25 and operations; and

1           “(O) foster public-private collaboration  
2 among government, industry research labora-  
3 tories, academia, and nonprofit organizations to  
4 maximize research and development efforts and  
5 the benefits of networking and information  
6 technology, including high-end computing.”;

7           (C) in paragraph (2)—

8           (i) by amending subparagraph (A) to  
9 read as follows:

10           “(A) establish the goals and priorities for  
11 Federal networking and information technology  
12 research, development, education, and other ac-  
13 tivities;”;

14           (ii) by amending subparagraph (C) to  
15 read as follows:

16           “(C) provide for interagency coordination  
17 of Federal networking and information tech-  
18 nology research, development, education, and  
19 other activities undertaken pursuant to the Pro-  
20 gram—

21           “(i) among the participating agencies;  
22 and

23           “(ii) to the extent practicable, with  
24 other Federal agencies not described in  
25 paragraph (3)(C), other Federal and pri-

1 vate research laboratories, industry, re-  
2 search entities, institutions of higher edu-  
3 cation, relevant nonprofit organizations,  
4 and international partners of the United  
5 States;”;

6 (iii) by amending subparagraph (E) to  
7 read as follows:

8 “(E) encourage and monitor the efforts of  
9 the agencies participating in the Program to al-  
10 locate the level of resources and management  
11 attention necessary to ensure that the strategic  
12 plans under subsection (e) are developed and  
13 executed effectively and that the objectives of  
14 the Program are met; and”;

15 (iv) in subparagraph (F), by striking  
16 “high-performance” and inserting “high-  
17 end”; and

18 (D) in paragraph (3)—

19 (i) by redesignating subparagraphs  
20 (B), (C), (D), and (E) as subparagraphs  
21 (C), (D), (E), and (G), respectively;

22 (ii) by inserting after subparagraph  
23 (A) the following:

1 “(B) provide a detailed description of the  
2 nature and scope of research infrastructure des-  
3 igned as such under the Program;”;

4 (iii) in subparagraph (C), as redesi-  
5 nated—

6 (I) by amending clause (i) to  
7 read as follows:

8 “(i) the Department of Justice;”;

9 (II) by redesignating clauses (vii)  
10 through (xi) as clauses (viii) through  
11 (xii), respectively;

12 (III) by inserting after clause (vi)  
13 the following:

14 “(vii) the Department of Homeland  
15 Security;”;

16 (IV) by amending clause (viii), as  
17 redesignated, to read as follows:

18 “(viii) the National Archives and  
19 Records Administration;”;

20 (iv) in subparagraph (D), as redesi-  
21 nated—

22 (I) by striking “is submitted,”  
23 and inserting “is submitted, the levels  
24 for the previous fiscal year;”;

1 (II) by striking “each Program  
2 Component Area;” and inserting  
3 “each Program Component Area and  
4 research area supported in accordance  
5 with section 102;”;

6 (v) by amending subparagraph (E), as  
7 redesignated, to read as follows:

8 “(E) describe the levels of Federal funding  
9 for each participating agency, and for each Pro-  
10 gram Component Area, for the fiscal year dur-  
11 ing which such report is submitted, the levels  
12 for the previous fiscal year, and the levels pro-  
13 posed for the fiscal year with respect to which  
14 the budget submission applies;” and

15 (vi) by inserting after subparagraph  
16 (E), as redesignated, the following:

17 “(F) include a description of how the ob-  
18 jectives for each Program Component Area, and  
19 the objectives for activities that involve multiple  
20 Program Component Areas, relate to the objec-  
21 tives of the Program identified in the strategic  
22 plans required under subsection (e); and”;

23 (3) in subsection (b)—

24 (A) in paragraph (1), in the matter pre-  
25 ceding subparagraph (A)—

1 (i) by striking “high-performance  
2 computing” both places it appears and in-  
3 sserting “networking and information tech-  
4 nology”; and

5 (ii) after the first sentence, by insert-  
6 ing the following: “Each chair of the advi-  
7 sory committee shall meet the qualifica-  
8 tions of committee membership and may  
9 be a member of the President’s Council of  
10 Advisors on Science and Technology.”;

11 (B) in paragraph (1)(D), by striking  
12 “high-performance computing, networking tech-  
13 nology, and related software” and inserting  
14 “networking and information technology”; and

15 (C) in paragraph (2)—

16 (i) in the second sentence, by striking  
17 “2” and inserting “3”;

18 (ii) by striking “Committee on Science  
19 and Technology” and inserting “Com-  
20 mittee on Science, Space, and Tech-  
21 nology”; and

22 (iii) by striking “The first report shall  
23 be due within 1 year after the date of en-  
24 actment of the America COMPETES  
25 Act.”;



1           (4) in subsection (c)(1)(A), by striking “high-  
2           performance computing” and inserting “networking  
3           and information technology”; and

4           (5) by adding at the end the following:

5           “(d) PERIODIC REVIEWS.—The heads of the partici-  
6           pating agencies, working through the National Science  
7           and Technology Council and the Program, shall—

8           “(1) periodically assess and update, as appro-  
9           priate, the structure of the Program, including the  
10          Program Component Areas and associated contents,  
11          scope, and funding levels, taking into consideration  
12          any relevant recommendations of the advisory com-  
13          mittee established under subsection (b); and

14          “(2) ensure that such agency’s implementation  
15          of the Program includes foundational, large-scale,  
16          long-term, and interdisciplinary information tech-  
17          nology research and development activities, including  
18          activities described in section 102.

19          “(e) STRATEGIC PLANS.—

20          “(1) IN GENERAL.—The heads of the partici-  
21          pating agencies, working through the National  
22          Science and Technology Council and the Program,  
23          shall develop and implement strategic plans to  
24          guide—

1           “(A) emerging activities of Federal net-  
2           working and information technology research  
3           and development; and

4           “(B) the activities described in subsection  
5           (a)(1).

6           “(2) UPDATES.—The heads of the participating  
7           agencies shall update the strategic plans as appro-  
8           priate.

9           “(3) CONTENTS.—Each strategic plan shall—

10           “(A) specify near-term and long-term ob-  
11           jectives for the portions of the Program rel-  
12           evant to the strategic plan, the anticipated  
13           schedule for achieving the near-term and long-  
14           term objectives, and the metrics to be used for  
15           assessing progress toward the near-term and  
16           long-term objectives;

17           “(B) specify how the near-term and long-  
18           term objectives complement research and devel-  
19           opment areas in which academia and the pri-  
20           vate sector are actively engaged;

21           “(C) describe how the heads of the partici-  
22           pating agencies will support mechanisms for  
23           foundational, large-scale, long-term, and inter-  
24           disciplinary information technology research

1 and development and for Grand Challenges, in-  
2 cluding through collaborations—

3 “(i) across Federal agencies;

4 “(ii) across Program Component  
5 Areas; and

6 “(iii) with industry, Federal and pri-  
7 vate research laboratories, research enti-  
8 ties, institutions of higher education, rel-  
9 evant nonprofit organizations, and inter-  
10 national partners of the United States;

11 “(D) describe how the heads of the partici-  
12 pating agencies will foster the rapid transfer of  
13 research and development results into new tech-  
14 nologies and applications in the national inter-  
15 est, including through cooperation and collabo-  
16 rations with networking and information tech-  
17 nology research, development, and technology  
18 transition initiatives supported by the States;  
19 and

20 “(E) describe how the portions of the Pro-  
21 gram relevant to the strategic plan will address  
22 long-term challenges for which solutions require  
23 foundational, large-scale, long-term, and inter-  
24 disciplinary information technology research  
25 and development.

1           “(4) PRIVATE SECTOR EFFORTS.—In devel-  
2           oping, implementing, and updating strategic plans,  
3           the heads of the participating agencies, working  
4           through the National Science and Technology Coun-  
5           cil and the Program, shall coordinate with industry,  
6           academia, and other interested stakeholders to en-  
7           sure, to the extent practicable, that the Federal net-  
8           working and information technology research and  
9           development activities carried out under this section  
10          do not duplicate the efforts of the private sector.

11          “(5) RECOMMENDATIONS.—In developing and  
12          updating strategic plans, the heads of the partici-  
13          pating agencies shall solicit recommendations and  
14          advice from—

15                 “(A) the advisory committee under sub-  
16                 section (b);

17                 “(B) the Committee on Science and rel-  
18                 evant subcommittees of the National Science  
19                 and Technology Council; and

20                 “(C) a wide range of stakeholders, includ-  
21                 ing industry, academia, National Laboratories,  
22                 and other relevant organizations and institu-  
23                 tions.

24          “(f) REPORTS.—The heads of the participating agen-  
25          cies, working through the National Science and Tech-

1 nology Council and the Program, shall submit to the advi-  
 2 sory committee, the Committee on Commerce, Science,  
 3 and Transportation of the Senate, and the Committee on  
 4 Science, Space, and Technology of the House of Rep-  
 5 resentatives—

6           “(1) the strategic plans developed under sub-  
 7           section (e)(1); and

8           “(2) each update under subsection (e)(2).”.

9           (g) NATIONAL RESEARCH AND EDUCATION NET-  
 10 WORK.—Section 102 of the High-Performance Computing  
 11 Act of 1991 (15 U.S.C. 5512) is repealed.

12           (h) NEXT GENERATION INTERNET.—Section 103 of  
 13 the High-Performance Computing Act of 1991 (15 U.S.C.  
 14 5513) is repealed.

15           (i) GRAND CHALLENGES IN AREAS OF NATIONAL IM-  
 16 PORTANCE.—Title I of the High-Performance Computing  
 17 Act of 1991 (15 U.S.C. 5511 et seq.) is amended by add-  
 18 ing at the end the following:

19           **“SEC. 102. GRAND CHALLENGES IN AREAS OF NATIONAL**  
 20   **IMPORTANCE.**

21           “(a) IN GENERAL.—The Program shall encourage  
 22 the participating agencies to support foundational, large-  
 23 scale, long-term, interdisciplinary, and interagency infor-  
 24 mation technology research and development activities in  
 25 networking and information technology directed toward

1 agency mission areas that have the potential for signifi-  
2 cant contributions to national economic competitiveness  
3 and for other significant societal benefits. Such activities,  
4 ranging from basic research to the demonstration of tech-  
5 nical solutions, shall be designed to advance the develop-  
6 ment of fundamental discoveries. The advisory committee  
7 established under section 101(b) shall make recommenda-  
8 tions to the Program for candidate research and develop-  
9 ment areas for support under this section.

10 “(b) CHARACTERISTICS.—

11 “(1) IN GENERAL.—Research and development  
12 activities under this section shall—

13 “(A) include projects selected on the basis  
14 of applications for support through a competi-  
15 tive, merit-based process;

16 “(B) to the extent practicable, involve col-  
17 laborations among researchers in institutions of  
18 higher education and industry, and may involve  
19 nonprofit research institutions and Federal lab-  
20 oratories, as appropriate;

21 “(C) to the extent practicable, leverage  
22 Federal investments through collaboration with  
23 related State and private sector initiatives; and

24 “(D) include a plan for fostering the trans-  
25 fer of research discoveries and the results of

1           technology demonstration activities, including  
2           from institutions of higher education and Fed-  
3           eral laboratories, to industry for commercial de-  
4           velopment.

5           “(2) COST-SHARING.—In selecting applications  
6           for support, the agencies may give special consider-  
7           ation to projects that include cost sharing from non-  
8           Federal sources.”.

9           (j) NATIONAL SCIENCE FOUNDATION ACTIVITIES.—  
10          Section 201 of the High-Performance Computing Act of  
11          1991 (15 U.S.C. 5521) is amended—

12                 (1) in subsection (a)—

13                         (A) by striking “(a) GENERAL RESPON-  
14                         SIBILITIES.—”;

15                         (B) in paragraph (1)—

16                                 (i) by inserting “high-end” after “Na-  
17                                 tional Science Foundation shall provide”;  
18                                 and

19                                 (ii) by striking “high-performance  
20                                 computing” and all that follows through  
21                                 “networking;” and inserting “networking  
22                                 and information technology; and”;

23                         (C) by striking paragraphs (2) through  
24                         (4); and

1 (D) by inserting after paragraph (1) the  
2 following:

3 “(2) the National Science Foundation shall use  
4 its existing programs, in collaboration with other  
5 agencies, as appropriate, to improve the teaching  
6 and learning of networking and information tech-  
7 nology at all levels of education and to increase par-  
8 ticipation in networking and information technology  
9 fields, including by individuals identified in sections  
10 33 and 34 of the Science and Engineering Equal  
11 Opportunities Act (42 U.S.C. 1885a and 1885b).”;  
12 and

13 (2) by striking subsection (b).

14 (k) NATIONAL AERONAUTICS AND SPACE ADMINIS-  
15 TRATION ACTIVITIES.—Section 202 of the High-Perform-  
16 ance Computing Act of 1991 (15 U.S.C. 5522) is amend-  
17 ed—

18 (1) by striking “(a) GENERAL RESPONSIBIL-  
19 ITIES.—”;

20 (2) by striking “high-performance computing”  
21 and inserting “networking and information tech-  
22 nology”; and

23 (3) by striking subsection (b).



1 (l) DEPARTMENT OF ENERGY ACTIVITIES.—Section  
2 203 of the High-Performance Computing Act of 1991 (15  
3 U.S.C. 5523) is amended—

4 (1) by striking “(a) GENERAL RESPONSIBIL-  
5 ITIES.—”;

6 (2) in paragraph (1), by striking “high-per-  
7 formance computing and networking” and inserting  
8 “networking and information technology”;

9 (3) in paragraph (2)(A), by striking “high-per-  
10 formance” and inserting “high-end”; and

11 (4) by striking subsection (b).

12 (m) DEPARTMENT OF COMMERCE ACTIVITIES.—Sec-  
13 tion 204 of the High-Performance Computing Act of 1991  
14 (15 U.S.C. 5524) is amended—

15 (1) in subsection (a)(1)—

16 (A) in subparagraph (A), by striking  
17 “high-performance computing systems and net-  
18 works” and inserting “networking and informa-  
19 tion technology systems and capabilities”;

20 (B) in subparagraph (B), by striking  
21 “interoperability of high-performance com-  
22 puting systems in networks and for common  
23 user interfaces to systems” and inserting  
24 “interoperability and usability of networking  
25 and information technology systems”; and

1 (C) in subparagraph (C), by striking  
2 “high-performance computing” and inserting  
3 “networking and information technology”;

4 (2) in subsection (b)—

5 (A) in the heading, by striking “HIGH-  
6 PERFORMANCE COMPUTING AND NETWORK”  
7 and inserting “NETWORKING AND INFORMA-  
8 TION TECHNOLOGY”;

9 (B) by striking “Pursuant to the Com-  
10 puter Security Act of 1987 (Public Law 100-  
11 235; 101 Stat. 1724), the” and inserting  
12 “The”; and

13 (C) by striking “sensitive information in  
14 Federal computer systems” and inserting “Fed-  
15 eral agency information and information sys-  
16 tems”; and

17 (3) by striking subsections (c) and (d).

18 (n) ENVIRONMENTAL PROTECTION AGENCY ACTIVI-  
19 TIES.—Section 205 of the High-Performance Computing  
20 Act of 1991 (15 U.S.C. 5525) is repealed.

21 (o) ROLE OF THE DEPARTMENT OF EDUCATION.—  
22 Section 206 of the High-Performance Computing Act of  
23 1991 (15 U.S.C. 5526) is repealed.

1 (p) MISCELLANEOUS PROVISIONS.—Section 207 of  
2 the High-Performance Computing Act of 1991 (15 U.S.C.  
3 5527) is amended—

4 (1) in subsection (a)(2), by striking “para-  
5 graphs (1) through (5) of section 2315(a) of title  
6 10” and inserting “section 3552(b)(6)(A)(i) of title  
7 44”; and

8 (2) in subsection (b), by striking “high-per-  
9 formance computing” and inserting “networking and  
10 information technology”.

11 (q) REPEAL.—Section 208 of the High-Performance  
12 Computing Act of 1991 (15 U.S.C. 5528) is repealed.

13 (r) NATIONAL SCIENCE FOUNDATION RESEARCH.—  
14 Section 4(b)(5)(K) of the Cyber Security Research and  
15 Development Act (15 U.S.C. 7403(b)(5)(K)) is amended  
16 by striking “high-performance computing” and inserting  
17 “networking and information technology”.

18 (s) NATIONAL INFORMATION TECHNOLOGY RE-  
19 SEARCH AND DEVELOPMENT PROGRAM.—Section  
20 13202(b) of the America Recovery and Reinvestment Act  
21 of 2009 (42 U.S.C. 17912(b)) is amended by striking  
22 “National High-Performance Computing Program” and  
23 inserting “Networking and Information Technology Re-  
24 search and Development Program”.

1 (t) FEDERAL CYBERSECURITY RESEARCH AND DE-  
2 VELOPMENT.—Section 201(a)(4) of the Cybersecurity En-  
3 hancement Act of 2014 (15 U.S.C. 7431(a)(4)) is amend-  
4 ed—

5 (1) by striking “clauses (i) through (x)” and in-  
6 serting “clauses (i) through (xi)”; and

7 (2) by striking “under clause (xi)” and insert-  
8 ing “under clause (xii)”.

9 (u) ADDITIONAL REPEAL.—Section 4 of the Depart-  
10 ment of Energy High-End Computing Revitalization Act  
11 of 2004 (15 U.S.C. 5543) is repealed.

12 **SEC. 106. PHYSICAL SCIENCES COORDINATION.**

13 (a) HIGH-ENERGY PHYSICS.—

14 (1) IN GENERAL.—The Physical Science Sub-  
15 committee of the National Science and Technology  
16 Council (referred to in this section as the “Sub-  
17 committee”) shall continue to coordinate Federal ef-  
18 forts related to high-energy physics research to  
19 maximize the efficiency and effectiveness of United  
20 States investment in high-energy physics.

21 (2) PURPOSES.—The purposes of the Sub-  
22 committee include—

23 (A) to advise and assist the Committee on  
24 Science and the National Science and Tech-  
25 nology Council on United States policies, proce-

1           dures, and plans in the physical sciences, in-  
2           cluding high-energy physics; and

3           (B) to identify emerging opportunities,  
4           stimulate international cooperation, and foster  
5           the development of the physical sciences in the  
6           United States, including—

7                   (i) in high-energy physics research, in-  
8                   cluding related underground science and  
9                   engineering research;

10                   (ii) in physical infrastructure and fa-  
11                   cilities;

12                   (iii) in information and analysis; and

13                   (iv) in coordination activities.

14           (3) RESPONSIBILITIES.—In regard to coordi-  
15           nating Federal efforts related to high-energy physics  
16           research, the Subcommittee shall, taking into ac-  
17           count the findings and recommendations of relevant  
18           advisory committees—

19                   (A) provide recommendations on planning  
20                   for construction and stewardship of large facili-  
21                   ties participating in high-energy physics;

22                   (B) provide recommendations on research  
23                   coordination and collaboration among the pro-  
24                   grams and activities of Federal agencies related

1 to underground science, neutrino research, dark  
2 energy, and dark matter research;

3 (C) establish goals and priorities for high-  
4 energy physics, related underground science,  
5 and research and development that will  
6 strengthen United States competitiveness in  
7 high-energy physics;

8 (D) propose methods for engagement with  
9 international, Federal, and State agencies and  
10 Federal laboratories not represented on the Na-  
11 tional Science and Technology Council to iden-  
12 tify and reduce regulatory, logistical, and fiscal  
13 barriers that inhibit United States leadership in  
14 high-energy physics and related underground  
15 science; and

16 (E) develop, and update as necessary, a  
17 strategic plan to guide Federal programs and  
18 activities in support of high-energy physics re-  
19 search, including—

20 (i) the efforts taken in support of  
21 paragraph (2) since the last strategic plan;

22 (ii) an evaluation of the current re-  
23 search needs for maintaining United States  
24 leadership in high-energy physics; and

1 (iii) an identification of future prior-  
2 ities in the area of high-energy physics.

3 (b) RADIATION BIOLOGY.—

4 (1) IN GENERAL.—The Subcommittee shall con-  
5 tinue to coordinate Federal efforts related to radi-  
6 ation biology research to maximize the efficiency and  
7 effectiveness of United States investment in radi-  
8 ation biology.

9 (2) RESPONSIBILITIES FOR RADIATION BIOL-  
10 OGY.—In regard to coordinating Federal efforts re-  
11 lated to radiation biology research, the Sub-  
12 committee shall—

13 (A) advise and assist the National Science  
14 and Technology Council on policies and initia-  
15 tives in radiation biology, including enhancing  
16 scientific knowledge of the effects of low dose  
17 radiation on biological systems to improve radi-  
18 ation risk management methods;

19 (B) identify opportunities to stimulate  
20 international cooperation and leverage research  
21 and knowledge from sources outside of the  
22 United States;

23 (C) ensure coordination between the De-  
24 partment of Energy Office of Science, Founda-  
25 tion, National Aeronautics and Space Adminis-

1           tration, National Institutes of Health, Environ-  
2           mental Protection Agency, Department of De-  
3           fense, Nuclear Regulatory Commission, and De-  
4           partment of Homeland Security;

5           (D) identify ongoing scientific challenges  
6           for understanding the long-term effects of ion-  
7           izing radiation on biological systems; and

8           (E) formulate overall scientific goals for  
9           the future of low-dose radiation research in the  
10          United States.

11          (c) FUSION ENERGY SCIENCES.—

12           (1) IN GENERAL.—The Subcommittee shall con-  
13          tinue to coordinate Federal efforts related to fusion  
14          energy research to maximize the efficiency and effec-  
15          tiveness of United States investment in fusion en-  
16          ergy sciences.

17           (2) RESPONSIBILITIES FOR FUSION ENERGY  
18          SCIENCES.—In regard to coordinating Federal ef-  
19          forts related to fusion energy sciences, the Sub-  
20          committee shall—

21           (A) advise and assist the National Science  
22          and Technology Council on policies and initia-  
23          tives in fusion energy sciences, including en-  
24          hancing scientific knowledge of fusion energy



1 science, plasma physics, and related materials  
2 sciences;

3 (B) identify opportunities to stimulate  
4 international cooperation and leverage research  
5 and knowledge from sources outside of the  
6 United States, including the ITER project;

7 (C) ensure coordination between the De-  
8 partment of Energy Office of Science, National  
9 Nuclear Security Administration, Advanced Re-  
10 search Projects Agency-Energy, National Aero-  
11 nautics and Space Administration, Foundation,  
12 and Department of Defense regarding fusion  
13 energy sciences and plasma physics; and

14 (D) formulate overall scientific goals for  
15 the future of fusion energy sciences and plasma  
16 physics.

17 **SEC. 107. LABORATORY PROGRAM IMPROVEMENTS.**

18 (a) IN GENERAL.—The Director of NIST, acting  
19 through the Associate Director for Laboratory Programs,  
20 shall develop and implement a comprehensive strategic  
21 plan for laboratory programs that expands—

22 (1) interactions with academia, international re-  
23 searchers, and industry; and

24 (2) commercial and industrial applications.

1 (b) OPTIMIZING COMMERCIAL AND INDUSTRIAL AP-  
2 PPLICATIONS.—In accordance with the purpose under sec-  
3 tion 1(b)(3) of the National Institute of Standards and  
4 Technology Act (15 U.S.C. 271(b)(3)), the comprehensive  
5 strategic plan shall—

6 (1) include performance metrics for the dissemi-  
7 nation of fundamental research results, measure-  
8 ments, and standards research results to industry,  
9 including manufacturing, and other interested par-  
10 ties;

11 (2) document any positive benefits of research  
12 on the competitiveness of the interested parties de-  
13 scribed in paragraph (1);

14 (3) clarify the current approach to the tech-  
15 nology transfer activities of NIST; and

16 (4) consider recommendations from the Na-  
17 tional Academy of Sciences.

18 **SEC. 108. STANDARD REFERENCE DATA ACT UPDATE.**

19 Section 2 of the Standard Reference Data Act (15  
20 U.S.C. 290a) is amended to read as follows:

21 **“SEC. 2. DEFINITIONS.**

22 “For the purposes of this Act:

23 “(1) STANDARD REFERENCE DATA.—The term  
24 ‘standard reference data’ means data that is—

25 “(A) either—

1 “(i) quantitative information related  
2 to a measurable physical, or chemical, or  
3 biological property of a substance or sys-  
4 tem of substances of known composition  
5 and structure;

6 “(ii) measurable characteristics of a  
7 physical artifact or artifacts;

8 “(iii) engineering properties or per-  
9 formance characteristics of a system; or

10 “(iv) one or more digital data objects  
11 that serve—

12 “(I) to calibrate or characterize  
13 the performance of a detection or  
14 measurement system; or

15 “(II) to interpolate or extrap-  
16 late, or both, data described in sub-  
17 paragraph (A) through (C); and

18 “(B) that is critically evaluated as to its  
19 reliability under section 3 of this Act.

20 “(2) SECRETARY.—The term ‘Secretary’ means  
21 the Secretary of Commerce.”.

22 **SEC. 109. NSF MID-SCALE PROJECT INVESTMENTS.**

23 (a) FINDINGS.—Congress makes the following find-  
24 ings:

1           (1) The Foundation funds major research facili-  
2 ties, infrastructure, and instrumentation that pro-  
3 vide unique capabilities at the frontiers of science  
4 and engineering.

5           (2) Modern and effective research facilities, in-  
6 frastructure, and instrumentation are critical to  
7 maintaining United States leadership in science and  
8 engineering.

9           (3) The costs of some proposed research instru-  
10 mentation, equipment, and upgrades to major re-  
11 search facilities fall between programs currently  
12 funded by the Foundation, creating a gap between  
13 the established parameters of the Major Research  
14 Instrumentation and Major Research Equipment  
15 and Facilities Construction programs, including  
16 projects that have been identified as cost-effective  
17 additions of high priority to the advancement of sci-  
18 entific understanding.

19           (4) The 2010 Astronomy and Astrophysics  
20 Decadal Survey recommended a mid-scale innova-  
21 tions program.

22 (b) MID-SCALE PROJECTS.—

23           (1) IN GENERAL.—The Foundation shall evalu-  
24 ate the existing and future needs, across all dis-

1       ciplines supported by the Foundation, for mid-scale  
2       projects.

3           (2) STRATEGY.—The Director of the Founda-  
4       tion shall develop a strategy to address the needs  
5       identified in paragraph (1).

6           (3) BRIEFING.—Not later than 180 days after  
7       the date of enactment of this Act, the Director of  
8       the Foundation shall provide a briefing to the appro-  
9       priate committees of Congress on the evaluation  
10      under paragraph (1) and the strategy under para-  
11      graph (2).

12          (4) DEFINITION OF MID-SCALE PROJECTS.—In  
13      this subsection, the term “mid-scale projects” means  
14      research instrumentation, equipment, and upgrades  
15      to major research facilities or other research infra-  
16      structure investments that exceed the maximum  
17      award funded by the major research instrumentation  
18      program and are below the minimum award funded  
19      by the major research equipment and facilities con-  
20      struction program as described in section 507 of the  
21      America COMPETES Reauthorization Act of 2010  
22      (Public Law 111–358; 124 Stat. 4008).

23 **SEC. 110. OVERSIGHT OF NSF MAJOR MULTI-USER RE-**  
24 **SEARCH FACILITY PROJECTS.**

25       (a) FACILITIES OVERSIGHT.—

1           (1) IN GENERAL.—The Director of the Founda-  
2           tion shall strengthen oversight and accountability  
3           over the full life cycle of each major multi-user re-  
4           search facility project, including planning, develop-  
5           ment, procurement, construction, operations, and  
6           support, and shutdown of the facility, in order to  
7           maximize research investment.

8           (2) REQUIREMENTS.—In carrying out para-  
9           graph (1), the Director shall—

10           (A) prioritize the scientific outcomes of a  
11           major multi-user research facility project and  
12           the internal management and financial over-  
13           sight of the major multi-user research facility  
14           project;

15           (B) clarify the roles and responsibilities of  
16           all organizations, including offices, panels, com-  
17           mittees, and directorates, involved in supporting  
18           a major multi-user research facility project, in-  
19           cluding the role of the Major Research Equip-  
20           ment and Facilities Construction Panel;

21           (C) establish policies and procedures for  
22           the planning, management, and oversight of a  
23           major multi-user research facility project at  
24           each phase of the life cycle of the major multi-  
25           user research facility project;

1 (D) ensure that policies for estimating and  
2 managing costs and schedules are consistent  
3 with the best practices described in the Govern-  
4 ment Accountability Office Cost Estimating and  
5 Assessment Guide, the Government Account-  
6 ability Office Schedule Assessment Guide, and  
7 the Office of Management and Budget Uniform  
8 Guidance (2 C.F.R. Part 200);

9 (E) establish the appropriate project man-  
10 agement and financial management expertise  
11 required for Foundation staff to oversee each  
12 major multi-user research facility project effec-  
13 tively, including by improving project manage-  
14 ment training and certification;

15 (F) coordinate the sharing of the best  
16 management practices and lessons learned from  
17 each major multi-user research facility project;

18 (G) continue to maintain a Large Facilities  
19 Office to support the research directorates in  
20 the development, implementation, and oversight  
21 of each major multi-user research facility  
22 project, including by—

23 (i) serving as the Foundation’s pri-  
24 mary resource for all policy or process  
25 issues related to the development, imple-

1                   mentation, and oversight of a major multi-  
2                   user research facility project;

3                   (ii) serving as a Foundation-wide re-  
4                   source on project management, including  
5                   providing expert assistance on nonscientific  
6                   and nontechnical aspects of project plan-  
7                   ning, budgeting, implementation, manage-  
8                   ment, and oversight;

9                   (iii) coordinating and collaborating  
10                  with research directorates to share best  
11                  management practices and lessons learned  
12                  from prior major multi-user research facil-  
13                  ity projects; and

14                  (iv) assessing each major multi-user  
15                  research facility project for cost and sched-  
16                  ule risk; and

17                  (H) appoint a senior agency official whose  
18                  responsibility is oversight of the development,  
19                  construction, and operations of major multi-  
20                  user research facilities across the Foundation.

21                  (b) FACILITIES FULL LIFE CYCLE COSTS.—

22                   (1) IN GENERAL.—Subject to subsection (c)(1),  
23                  the Director of the Foundation shall require that  
24                  any pre-award analysis of a major multi-user re-  
25                  search facility project includes the development and



1 consideration of the full life cycle cost (as defined in  
2 section 2 of the National Science Foundation Au-  
3 thorization Act of 1998 (42 U.S.C. 1862k note)) in  
4 accordance with section 14 of the National Science  
5 Foundation Authorization Act of 2002 (42 U.S.C.  
6 1862n-4).

7 (2) IMPLEMENTATION.—Based on the pre-  
8 award analysis described in paragraph (1), the Di-  
9 rector of the Foundation shall include projected  
10 operational costs within the Foundation’s out-years  
11 as part of the President’s annual budget submission  
12 to Congress under section 1105 of title 31, United  
13 States Code.

14 (c) COST OVERSIGHT.—

15 (1) PRE-AWARD ANALYSIS.—

16 (A) IN GENERAL.—The Director of the  
17 Foundation and the National Science Board  
18 may not approve or execute any agreement to  
19 start construction on any proposed major multi-  
20 user research facility project unless—

21 (i) an external analysis of the pro-  
22 posed budget has been conducted to ensure  
23 the proposal is complete and reasonable;

1 (ii) the analysis under clause (i) fol-  
2 lows the Government Accountability Office  
3 Cost Estimating and Assessment Guide;

4 (iii) except as provided under sub-  
5 paragraph (C), an analysis of the account-  
6 ing systems has been conducted;

7 (iv) an independent cost estimate of  
8 the construction of the project has been  
9 conducted using the same detailed tech-  
10 nical information as the project proposal  
11 estimate to determine whether the estimate  
12 is well-supported and realistic; and

13 (v) the Foundation and the National  
14 Science Board have considered the anal-  
15 yses under clauses (i) and (iii) and the  
16 independent cost estimate under clause (iv)  
17 and resolved any major issues identified  
18 therein.

19 (B) AUDITS.—An external analysis under  
20 subparagraph (A)(i) may include an audit.

21 (C) EXCEPTION.—The Director of the  
22 Foundation, at the Director's discretion, may  
23 waive the requirement under subparagraph  
24 (A)(iii) if a similar analysis of the accounting  
25 systems was conducted in the prior years.

1           (2) CONSTRUCTION OVERSIGHT.—The Director  
2 of the Foundation shall require for each major  
3 multi-user research facility project—

4           (A) periodic external reviews on project  
5 management and performance;

6           (B) adequate internal controls, policies,  
7 and procedures, and reliable accounting systems  
8 in preparation for the incurred cost audits  
9 under subparagraph (D);

10          (C) annual incurred cost submissions of fi-  
11 nancial expenditures; and

12          (D) an incurred cost audit of the major  
13 multi-user research facility project in accord-  
14 ance with Government Accountability Office  
15 Government Auditing Standards—

16           (i) at least once during construction  
17 at a time determined based on risk anal-  
18 ysis and length of the award, except that  
19 the length of time between audits may not  
20 exceed 3 years; and

21           (ii) at the completion of the construc-  
22 tion phase.

23           (3) OPERATIONS COST ANALYSIS.—The Direc-  
24 tor of the Foundation shall require an independent

1 cost analysis of the operational proposal for each  
2 major multi-user research facility project.

3 (d) CONTINGENCY.—

4 (1) IN GENERAL.—The Director of the Founda-  
5 tion shall strengthen internal controls to improve  
6 oversight of contingency on a major multi-user re-  
7 search facility project.

8 (2) REQUIREMENTS.—In carrying out para-  
9 graph (1), the Director of the Foundation shall—

10 (A) only include contingency amounts in  
11 an award in accordance with section 200.433 of  
12 title 2, Code of Federal Regulations (relating to  
13 contingency provisions), or any successor regu-  
14 lation;

15 (B) retain control over funds budgeted for  
16 contingency, except that the Director may dis-  
17 burse budgeted contingency funds incrementally  
18 to the awardee to ensure project stability and  
19 continuity;

20 (C) track contingency use; and

21 (D) ensure that contingency amounts allo-  
22 cated to the performance baseline are reason-  
23 able and allowable.

24 (e) USE OF FEES.—

1           (1) SENSE OF CONGRESS.—It is the sense of  
2 Congress that—

3                   (A) the use of taxpayer-funded award fees  
4 should be transparent and explicable; and

5                   (B) the Foundation should implement an  
6 award fee policy that ensures more trans-  
7 parency and accountability in the funding of  
8 necessary and appropriate expenses directly re-  
9 lated to the construction and operation of major  
10 multi-user research facilities.

11           (2) REPORTING AND RECORDKEEPING.—The  
12 Director of the Foundation shall establish guidelines  
13 for awardees regarding inappropriate expenditures  
14 associated with all fee types used in cooperative  
15 agreements, including for alcoholic beverages, lob-  
16 bying, meals or entertainment for nonbusiness pur-  
17 poses, nonbusiness travel, and any other purpose the  
18 Director determines is inappropriate.

19           (f) OVERSIGHT IMPLEMENTATION PROGRESS.—The  
20 Director of the Foundation shall—

21                   (1) not later than 90 days after the date of en-  
22 actment of this Act, and periodically thereafter until  
23 the completion date, provide a briefing to the appro-  
24 priate committees of Congress on the response to or  
25 progress made toward implementation of—

1 (A) this section;

2 (B) all of the issues and recommendations  
3 identified in cooperative agreement audit re-  
4 ports and memoranda issued by the Inspector  
5 General of the Foundation in the last 5 years;  
6 and

7 (C) all of the issues and recommendations  
8 identified by a panel of the National Academy  
9 of Public Administration in the December 2015  
10 report entitled “National Science Foundation:  
11 Use of Cooperative Agreements to Support  
12 Large Scale Investment in Research”; and

13 (2) not later than 1 year after the date of en-  
14 actment of this Act, notify the appropriate commit-  
15 tees of Congress when the Foundation has imple-  
16 mented the recommendations identified in a panel of  
17 the National Academy of Public Administration re-  
18 port issued December 2015.

19 (g) DEFINITIONS.—In this section:

20 (1) APPROPRIATE COMMITTEES OF CON-  
21 GRESS.—The term “appropriate committees of Con-  
22 gress” means the Committee on Commerce, Science,  
23 and Transportation and the Committee on Appro-  
24 priations of the Senate and the Committee on

1 Science, Space, and Technology and the Committee  
2 on Appropriations of the House of Representatives.

3 (2) MAJOR MULTI-USER RESEARCH FACILITY  
4 PROJECT.—The term “‘major multi-user research  
5 facility project’” means a science and engineering  
6 facility project that—

7 (A) exceeds the lesser of—

8 (i) 10 percent of a Directorate’s an-  
9 nual budget; or

10 (ii) \$100,000,000 in total project  
11 costs; or

12 (B) is funded by the major research equip-  
13 ment and facilities construction account, or any  
14 successor account.

15 **SEC. 111. PERSONNEL OVERSIGHT.**

16 (a) CONFLICTS OF INTEREST.—The Director of the  
17 Foundation shall update the policy and procedure of the  
18 Foundation relating to conflicts of interest to improve doc-  
19 umentation and management of any known conflict of in-  
20 terest of an individual on temporary assignment at the  
21 Foundation, including an individual on assignment under  
22 the Intergovernmental Personnel Act of 1970 (42 U.S.C.  
23 4701 et seq.).

24 (b) JUSTIFICATIONS.—The Deputy Director of the  
25 Foundation shall submit annually to the appropriate com-

1 mittees of Congress written justification for each rotator  
2 employed under the Intergovernmental Personnel Act of  
3 1970 (42 U.S.C. 4701 et seq.), or other rotator employed,  
4 by the Foundation that year that is paid at a rate that  
5 exceeds the maximum rate of pay for the Senior Executive  
6 Service, including, if applicable, the level of adjustment for  
7 the certified Senior Executive Service Performance Ap-  
8 praisal System.

9 (c) REPORT.—Not later than 1 year after the date  
10 of enactment of this Act, the Director of the Foundation  
11 shall submit to the appropriate committees of Congress  
12 a report on the Foundation’s efforts to control costs asso-  
13 ciated with employing rotators, including the results of  
14 and participation in the Foundation’s cost-sharing pilot  
15 program and the Foundation’s progress in responding to  
16 the findings and implementing the recommendations of  
17 the Office of Inspector General of the Foundation related  
18 to the employment of rotators.

19 **SEC. 112. MANAGEMENT OF THE U.S. ANTARCTIC PRO-**  
20 **GRAM.**

21 (a) REVIEW.—

22 (1) IN GENERAL.—The Director of the Founda-  
23 tion shall continue to review the efforts by the Foun-  
24 dation to sustain and strengthen scientific efforts in



1 the face of logistical challenges for the United States  
2 Antarctic Program.

3 (2) ISSUES TO BE EXAMINED.—In conducting  
4 the review, the Director shall examine, at a min-  
5 imum, the following:

6 (A) Implementation by the Foundation of  
7 issues and recommendations identified by—

8 (i) the Inspector General of the Na-  
9 tional Science Foundation in audit reports  
10 and memoranda on the United States Ant-  
11 arctic Program in the last 4 years;

12 (ii) the U.S. Antarctic Program Blue  
13 Ribbon Panel report, More and Better  
14 Science in Antarctica through Increased  
15 Logistical Effectiveness, issued July 23,  
16 2012; and

17 (iii) the National Research Council re-  
18 port, Future Science Opportunities in Ant-  
19 arctica and the Southern Ocean, issued  
20 September 2011.

21 (B) Efforts by the Foundation to track its  
22 progress in addressing the issues and rec-  
23 ommendations under subparagraph (A).

24 (C) Efforts by the Foundation to address  
25 other opportunities and challenges, including ef-

1           forts on scientific research, coordination with  
2           other Federal agencies and international part-  
3           ners, logistics and transportation, health and  
4           safety of participants, oversight and financial  
5           management of awardees and contractors, and  
6           resources and policy challenges.

7           (b) BRIEFING.—Not later than 180 days after the  
8           date of enactment of this Act, the Director shall brief the  
9           appropriate committees of Congress on the ongoing re-  
10          view, including findings and any recommendations.

11       **SEC. 113. NIST CAMPUS SECURITY.**

12          (a) SUPERVISORY AUTHORITY.—The Department of  
13          Commerce Office of Security shall directly manage the law  
14          enforcement and site security programs of NIST through  
15          an assigned Director of Security for NIST without in-  
16          creasing the number of full-time equivalent employees of  
17          the Department of Commerce, including NIST.

18          (b) REPORTS.—The Director of Security for NIST  
19          shall provide an activities and security report on a quar-  
20          terly basis for the first year after the date of enactment  
21          of this Act, and on an annual basis thereafter, to the  
22          Under Secretary for Standards and Technology and the  
23          appropriate committees of Congress.

1 **SEC. 114. COORDINATION OF SUSTAINABLE CHEMISTRY RE-**  
2 **SEARCH AND DEVELOPMENT.**

3 (a) **IMPORTANCE OF SUSTAINABLE CHEMISTRY.**—It  
4 is the sense of Congress that—

5 (1) the science of chemistry is vital to improv-  
6 ing the quality of human life and plays an important  
7 role in addressing critical global challenges, includ-  
8 ing water quality, energy, health care, and agri-  
9 culture;

10 (2) sustainable chemistry can reduce risks to  
11 human health and the environment, reduce waste,  
12 improve pollution prevention, promote safe and effi-  
13 cient manufacturing, and promote efficient use of re-  
14 sources in developing new materials, processes, and  
15 technologies that support viable long-term solutions  
16 to a significant number of challenges;

17 (3) sustainable chemistry can stimulate innova-  
18 tion, encourage new and creative approaches to  
19 problems, create jobs, and save money; and

20 (4) a coordinated effort on sustainable chem-  
21 istry will allow for a greater return on research in-  
22 vestment in this area.

23 (b) **SUSTAINABLE CHEMISTRY BASIC RESEARCH.**—  
24 Subject to the availability of appropriated funds, the Di-  
25 rector of the Foundation may continue to carry out the  
26 Sustainable Chemistry Basic Research program author-

1 ized under section 509 of the National Science Foundation  
2 Authorization Act of 2010 (42 U.S.C. 1862p-3).

3 **SEC. 115. MISREPRESENTATION OF RESEARCH RESULTS.**

4 (a) PROHIBITION.—The Director of the Foundation  
5 may revise the regulations under part 689 of title 45, Code  
6 of Federal Regulations (relating to research misconduct),  
7 to ensure that the findings and conclusions of any article  
8 authored by a principal investigator, using the results of  
9 research conducted under a Foundation grant, that is pub-  
10 lished in a peer-reviewed publication, made publicly avail-  
11 able, or incorporated in an application for a research grant  
12 or grant extension from the Foundation, does not contain  
13 any falsification, fabrication, or plagiarism.

14 (b) INTERAGENCY COMMUNICATION.—Upon a find-  
15 ing that research misconduct has occurred, the Founda-  
16 tion shall, in addition to any possible final action under  
17 section 689.3 of title 45, Code of Federal Regulations, no-  
18 tify other Federal science agencies of the finding.

19 **SEC. 116. RESEARCH REPRODUCIBILITY AND REPLICA-**  
20 **TION.**

21 (a) SENSE OF CONGRESS.—It is the sense of Con-  
22 gress that—

23 (1) the gold standard of good science is the  
24 ability of a researcher or research laboratory to re-

1 produce a published research finding, including  
2 methods;

3 (2) there is growing concern that some pub-  
4 lished research findings cannot be reproduced or  
5 replicated, which can negatively affect the public's  
6 trust in science;

7 (3) there are a complex set of factors affecting  
8 reproducibility and replication; and

9 (4) the increasing interdisciplinary nature and  
10 complexity of scientific research may be a contrib-  
11 uting factor to issues with research reproducibility  
12 and replication.

13 (b) REPORT.—

14 (1) IN GENERAL.—Not later than 45 days after  
15 the date of enactment of this Act, the Director of  
16 the Foundation shall enter into an agreement with  
17 the National Research Council—

18 (A) to assess research and data reproduc-  
19 ibility and replicability issues in interdiscipli-  
20 nary research;

21 (B) to make recommendations for improv-  
22 ing rigor and transparency in scientific re-  
23 search; and

24 (C) to submit to the Director of the Foun-  
25 dation a report on the assessment, including its

1 findings and recommendations, not later than 1  
2 year after the date of enactment of this Act.

3 (2) SUBMISSION TO CONGRESS.—Not later than  
4 60 days after the date the Director of the Founda-  
5 tion receives the report under paragraph (1)(C), the  
6 Director shall submit the report to the appropriate  
7 committees of Congress, including a response from  
8 the Director of the Foundation and the Chair of the  
9 National Science Board as to whether they agree  
10 with each of the findings and recommendations in  
11 the report.

12 **SEC. 117. BRAIN RESEARCH THROUGH ADVANCING INNO-**  
13 **VATIVE NEUROTECHNOLOGIES INITIATIVE.**

14 (a) IN GENERAL.—The Foundation shall support re-  
15 search activities related to the interagency Brain Research  
16 through Advancing Innovative Neurotechnologies Initia-  
17 tive.

18 (b) SENSE OF CONGRESS.—It is the sense of Con-  
19 gress that the Foundation should work in conjunction with  
20 the Interagency Working Group on Neuroscience estab-  
21 lished by the National Science and Technology Council,  
22 Committee on Science to determine how to use the data  
23 infrastructure of the Foundation and other applicable  
24 Federal science agencies to help neuroscientists collect,  
25 standardize, manage, and analyze the large amounts of

1 data that result from research attempting to understand  
2 how the brain functions.

3 **TITLE II—ADMINISTRATIVE AND**  
4 **REGULATORY BURDEN RE-**  
5 **DUCTION**

6 **SEC. 201. INTERAGENCY WORKING GROUP ON RESEARCH**  
7 **REGULATION.**

8 (a) **SHORT TITLE.**—This section may be cited as the  
9 “Research and Development Efficiency Act”.

10 (b) **FINDINGS.**—Congress makes the following find-  
11 ings:

12 (1) Scientific and technological advancement  
13 have been the largest drivers of economic growth in  
14 the last 50 years, with the Federal Government  
15 being the largest investor in basic research.

16 (2) Substantial and increasing administrative  
17 burdens and costs in Federal research administra-  
18 tion, particularly in the higher education sector  
19 where most federally funded research is performed,  
20 are eroding funds available to carry out basic sci-  
21 entific research.

22 (3) Federally funded grants are increasingly  
23 competitive, with the Foundation funding only ap-  
24 proximately 1 in every 5 grant proposals.

1           (4) Progress has been made over the last dec-  
2           ade in streamlining the pre-award grant application  
3           process through the Federal Government's  
4           Grants.gov website.

5           (5) Post-award administrative costs have in-  
6           creased as Federal research agencies have continued  
7           to impose agency-unique compliance and reporting  
8           requirements on researchers and research institu-  
9           tions.

10          (6) Researchers spend as much as 42 percent  
11          of their time complying with Federal regulations, in-  
12          cluding administrative tasks such as applying for  
13          grants or meeting reporting requirements.

14          (c) SENSE OF CONGRESS.—It is the sense of Con-  
15          gress that—

16               (1) administrative burdens faced by researchers  
17               may be reducing the return on investment of feder-  
18               ally funded research and development; and

19               (2) it is a matter of critical importance to  
20               United States competitiveness that administrative  
21               costs of federally funded research be streamlined so  
22               that a higher proportion of Federal funding is ap-  
23               plied to direct research activities.

24          (d) ESTABLISHMENT.—The Director of the Office of  
25          Management and Budget, in coordination with the Office



1 of Science and Technology Policy, shall establish an inter-  
2 agency working group (referred to in this section as the  
3 “Working Group”) for the purpose of reducing adminis-  
4 trative burdens on federally funded researchers while pro-  
5 tecting the public interest through the transparency of and  
6 accountability for federally funded activities.

7 (e) RESPONSIBILITIES.—

8 (1) IN GENERAL.—The Working Group shall—

9 (A) regularly review relevant, administra-  
10 tion-related regulations imposed on federally  
11 funded researchers;

12 (B) recommend those regulations or proc-  
13 esses that may be eliminated, streamlined, or  
14 otherwise improved for the purpose described in  
15 subsection (d);

16 (C) recommend ways to minimize the regu-  
17 latory burden on United States institutions of  
18 higher education performing federally funded  
19 research while maintaining accountability for  
20 Federal funding; and

21 (D) recommend ways to identify and up-  
22 date specific regulations to refocus on perform-  
23 ance-based goals rather than on process while  
24 achieving the outcome described in subpara-  
25 graph (C).

1 (2) GRANT REVIEW.—

2 (A) IN GENERAL.—The Working Group  
3 shall—

4 (i) conduct a comprehensive review of  
5 Federal science agency grant proposal doc-  
6 uments; and

7 (ii) develop, to the extent practicable,  
8 a simplified, uniform grant format to be  
9 used by all Federal science agencies.

10 (B) CONSIDERATIONS.—In developing the  
11 uniform grant format, the Working Group shall  
12 consider whether to implement—

13 (i) procedures for preliminary project  
14 proposals in advance of peer-review selec-  
15 tion;

16 (ii) increased use of “Just-In-Time”  
17 procedures for documentation that does  
18 not bear directly on the scientific merit of  
19 a proposal;

20 (iii) simplified initial budget proposals  
21 in advance of peer review selection; and

22 (iv) detailed budget proposals for ap-  
23 plicants that peer review selection identi-  
24 fies as likely to be funded.

1           (3) CENTRALIZED RESEARCHER PROFILE DATA-  
2           BASE.—

3           (A) ESTABLISHMENT.—The Working  
4           Group shall establish, to the extent practicable,  
5           a secure, centralized database for investigator  
6           biosketches, curriculum vitae, licenses, lists of  
7           publications, and other documents considered  
8           relevant by the Working Group.

9           (B) CONSIDERATIONS.—In establishing the  
10          centralized profile database under subparagraph  
11          (A), the Working Group shall consider incor-  
12          porating existing investigator databases.

13          (C) GRANT PROPOSALS.—To the extent  
14          practicable, all grant proposals shall utilize the  
15          centralized investigator profile database estab-  
16          lished under subparagraph (A).

17          (D) REQUIREMENTS.—Each investigator  
18          shall—

19                 (i) be responsible for ensuring the in-  
20                 vestigator’s profile is current and accurate;  
21                 and

22                 (ii) be assigned a unique identifier  
23                 linked to the database and accessible to all  
24                 Federal funding agencies.

1 (4) CENTRALIZED ASSURANCES REPOSITORY.—

2 The Working Group shall—

3 (A) establish a central repository for all of  
4 the assurances required for Federal research  
5 grants; and

6 (B) provide guidance to institutions of  
7 higher education and Federal science agencies  
8 on the use of the centralized assurances reposi-  
9 tory.

10 (5) COMPREHENSIVE REVIEW.—

11 (A) IN GENERAL.—The Working Group  
12 shall—

13 (i) conduct a comprehensive review of  
14 the mandated progress reports for federally  
15 funded research; and

16 (ii) develop a strategy to simplify in-  
17 vestigator progress reports.

18 (B) CONSIDERATIONS.—In developing the  
19 strategy, the Working Group shall consider lim-  
20 iting progress reports to performance outcomes.

21 (f) CONSULTATION.—In carrying out its responsibil-  
22 ities under subsection (e)(1), the Working Group shall  
23 consult with academic researchers outside the Federal  
24 Government, including—

25 (1) federally funded researchers;

- 1 (2) nonfederally funded researchers;
- 2 (3) institutions of higher education and their
- 3 representative associations;
- 4 (4) scientific and engineering disciplinary soci-
- 5 eties and associations;
- 6 (5) nonprofit research institutions;
- 7 (6) industry, including small businesses;
- 8 (7) federally funded research and development
- 9 centers; and
- 10 (8) members of the public with a stake in en-
- 11 suring effectiveness, efficiency, and accountability in
- 12 the performance of scientific research.

13 (g) REPORTS.—Not later than 1 year after the date  
14 of enactment of this Act, and annually thereafter for 3  
15 years, the Working Group shall submit to the appropriate  
16 committees of Congress a report on its responsibilities  
17 under this section, including a discussion of the consider-  
18 ations described in paragraphs (2)(B), (3)(B), and (5)(B)  
19 of subsection (e) and recommendations made under sub-  
20 section (e)(1).

21 **SEC. 202. SCIENTIFIC AND TECHNICAL COLLABORATION.**

22 (a) DEFINITION OF SCIENTIFIC AND TECHNICAL  
23 WORKSHOP.—In this section, the term “scientific and  
24 technical workshop” means a symposium, seminar, or any  
25 other organized, formal gathering where scientists or engi-

1 neers working in STEM research and development fields  
2 assemble to coordinate, exchange and disseminate infor-  
3 mation or to explore or clarify a defined subject, problem  
4 or area of knowledge in the STEM fields.

5 (b) SENSE OF CONGRESS.—It is the sense of Con-  
6 gress that—

7 (1) the United States should encourage broad  
8 dissemination of Federal research findings and en-  
9 gagement of Federal researchers with the scientific  
10 and technical community; and

11 (2) laboratory, test center, and field center di-  
12 rectors and other similar heads of offices should ap-  
13 prove scientific and technical workshop attendance  
14 if—

15 (A) that attendance would meet the mis-  
16 sion of the laboratory or test center; and

17 (B) sufficient laboratory or test center  
18 funds are available for that purpose.

19 (c) ATTENDANCE POLICIES.—Not later than 180  
20 days after the date of enactment of this Act, the heads  
21 of the Federal science agencies shall each develop an ac-  
22 tion plan for the implementation of revisions and updates  
23 to their policies on attendance at scientific and technical  
24 workshops.

1 (d) NIST WORKSHOPS.—Section 2(c) of the National  
2 Institute of Standards and Technology Act (15 U.S.C.  
3 272(c)), as amended by section 104 of this Act, is further  
4 amended—

5 (1) by redesignating paragraphs (19) through  
6 (24) as paragraphs (22) through (27), respectively;  
7 and

8 (2) by inserting after paragraph (18) the fol-  
9 lowing:

10 “(19) host, participate in, and support scientific  
11 and technical workshops (as defined in section 202  
12 of the American Innovation and Competitiveness  
13 Act);

14 “(20) collect and retain any fees charged by the  
15 Secretary for hosting a scientific and technical work-  
16 shop described in paragraph (19);

17 “(21) notwithstanding title 31 of the United  
18 States Code, use the fees described in paragraph  
19 (20) to pay for any related expenses, including sub-  
20 sistence expenses for participants;”.

21 **SEC. 203. NIST GRANTS AND COOPERATIVE AGREEMENTS**

22 **UPDATE.**

23 Section 8(a) of the Stevenson-Wydler Technology In-  
24 novation Act of 1980 (15 U.S.C. 3706(a)) is amended by  
25 striking “The total amount of any such grant or coopera-

1 tive agreement may not exceed 75 percent of the total cost  
2 of the program.”.

3 **SEC. 204. REPEAL OF CERTAIN OBSOLETE REPORTS.**

4 (a) REPEAL OF CERTAIN OBSOLETE REPORTS.—

5 (1) NIST REPORTS.—

6 (A) REPORT ON DONATION OF EDUCA-  
7 TIONALLY USEFUL FEDERAL EQUIPMENT TO  
8 SCHOOLS.—Section 6(b) of the Technology Ad-  
9 ministration Act of 1998 (15 U.S.C. 272 note)  
10 is amended—

11 (i) in paragraph (1), by striking “(1)  
12 IN GENERAL.—” and indenting appro-  
13 priately; and

14 (ii) by striking paragraph (2).

15 (B) THREE-YEAR PROGRAMMATIC PLAN-  
16 NING DOCUMENT.—

17 (i) IN GENERAL.—Section 23 of the  
18 National Institute of Standards and Tech-  
19 nology Act (15 U.S.C. 278i) is amended by  
20 striking subsections (c) and (d).

21 (ii) CONFORMING AMENDMENT.—Sec-  
22 tion 10(h)(1) of the National Institute of  
23 Standards and Technology Act (15 U.S.C.  
24 278(h)(1)) is amended by striking the last  
25 sentence.



1           (2) MULTI-AGENCY REPORT ON INNOVATION  
2 ACCELERATION RESEARCH.—Section 1008 of the  
3 America COMPETES Act (42 U.S.C. 6603) is  
4 amended—

5                   (A) by striking subsection (c); and

6                   (B) by redesignating subsection (d) as sub-  
7 section (c).

8           (3) NSF REPORTS.—

9                   (A) FUNDING FOR SUCCESSFUL STEM  
10 EDUCATION PROGRAMS; REPORT TO CON-  
11 GRESS.—Section 7012 of the America COM-  
12 PETES Act (42 U.S.C. 1862o-4) is amended  
13 by striking subsection (c).

14                   (B) ENCOURAGING PARTICIPATION; EVAL-  
15 UATION AND REPORT.—Section 7031 of the  
16 America COMPETES Act (42 U.S.C. 1862o-  
17 11) is amended by striking subsection (b).

18                   (C) MATH AND SCIENCE PARTNERSHIPS  
19 PROGRAM COORDINATION REPORT.—Section  
20 9(e) of the National Science Foundation Au-  
21 thorization Act of 2002 (42 U.S.C. 1862n(c)) is  
22 amended—

23                           (i) by striking paragraph (4); and

24                           (ii) by redesignating paragraph (5) as  
25 paragraph (4).

1 (b) NATIONAL NANOTECHNOLOGY INITIATIVE RE-  
2 PORTS.—The 21st Century Nanotechnology Research and  
3 Development Act (15 U.S.C. 7501 et seq.) is amended—

4 (1) by amending section 2(c)(4) (15 U.S.C.  
5 7501(c)(4)) to read as follows:

6 “(4) develop, not later than 5 years after the  
7 date of the release of the most recent strategic plan,  
8 and update every 5 years thereafter, a strategic plan  
9 to guide the activities described under subsection (b)  
10 that describes—

11 “(A) the near-term and long-term objec-  
12 tives for the Program;

13 “(B) the anticipated schedule for achieving  
14 the near-term objectives;

15 “(C) the metrics that will be used to assess  
16 progress toward the near-term and long-term  
17 objectives;

18 “(D) how the Program will move results  
19 out of the laboratory and into application for  
20 the benefit of society;

21 “(E) the Program’s support for long-term  
22 funding for interdisciplinary research and devel-  
23 opment in nanotechnology; and

24 “(F) the allocation of funding for inter-  
25 agency nanotechnology projects;”;

1           (2) by amending section 4(d) (15 U.S.C.  
2           7503(d)) to read as follows:

3           “(d) REPORTS.—Not later than 4 years after the  
4 date of the most recent assessment under subsection (c),  
5 and quadrennially thereafter, the Advisory Panel shall  
6 submit to the President, the Committee on Commerce,  
7 Science, and Transportation of the Senate, and the Com-  
8 mittee on Science, Space, and Technology of the House  
9 of Representatives a report on its assessments under sub-  
10 section (c) and its recommendations for ways to improve  
11 the Program.”; and

12           (3) in section 5 (15 U.S.C. 7504)—

13           (A) in the heading, by striking “**TRI-**  
14           **ENNIAL**” and inserting “**QUADRENNIAL**”;

15           (B) in subsection (a), in the matter pre-  
16           ceding paragraph (1), by striking “triennial”  
17           and inserting “quadrennial”;

18           (C) in subsection (b), by striking “tri-  
19           ennial” and inserting “quadrennial”;

20           (D) in subsection (c), by striking “tri-  
21           ennial” and inserting “quadrennial”; and

22           (E) by amending subsection (d) to read as  
23           follows:

24           “(d) REPORT.—

1           “(1) IN GENERAL.—Not later than 30 days  
2 after the date the first evaluation under subsection  
3 (a) is received, and quadrennially thereafter, the Di-  
4 rector of the National Nanotechnology Coordination  
5 Office shall report to the President its assessments  
6 under subsection (c) and its recommendations for  
7 ways to improve the Program.

8           “(2) CONGRESS.—Not later than 30 days after  
9 the date the President receives the report under  
10 paragraph (1), the Director of the Office of Science  
11 and Technology Policy shall transmit a copy of the  
12 report to Congress.”.

13           (c) MAJOR RESEARCH EQUIPMENT AND FACILITIES  
14 CONSTRUCTION.—Section 14 of the National Science  
15 Foundation Authorization Act of 2002 (42 U.S.C. 1862n-  
16 4) is amended—

17           (1) by amending subsection (a) to read as fol-  
18 lows:

19           “(a) PRIORITIZATION OF PROPOSED MAJOR RE-  
20 SEARCH EQUIPMENT AND FACILITIES CONSTRUCTION.—

21           “(1) DEVELOPMENT OF PRIORITIES.—The Di-  
22 rector shall—

23           “(A) develop a list indicating by number  
24 the relative priority for funding under the  
25 major research equipment and facilities con-

1           struction account that the Director assigns to  
2           each project the Board has approved for inclu-  
3           sion in a future budget request; and

4                   “(B) submit the list described in subpara-  
5                   graph (A) to the Board for approval.

6           “(2) CRITERIA.—The Director shall include in  
7           the criteria for developing the list under paragraph  
8           (1) the readiness of plans for construction and oper-  
9           ation, including confidence in the estimates of the  
10          full life cycle cost (as defined in section 2 of the Na-  
11          tional Science Foundation Authorization Act of 1998  
12          (42 U.S.C. 1862k note)) and the proposed schedule  
13          of completion.

14                   “(3) UPDATES.—The Director shall update the  
15                   list prepared under paragraph (1) each time the  
16                   Board approves a new project that would receive  
17                   funding under the major research equipment and fa-  
18                   cilities construction account and periodically submit  
19                   any updated list to the Board for approval.”;

20                   (2) by striking subsection (e);

21                   (3) by redesignating subsections (c) and (d) as  
22                   subsections (b) and (c), respectively; and

23                   (4) by amending subsection (c), as redesign-  
24                   nated, to read as follows:

1       “(c) BOARD APPROVAL OF MAJOR RESEARCH  
2 EQUIPMENT AND FACILITIES PROJECTS.—The Board  
3 shall explicitly approve any project to be funded out of  
4 the major research equipment and facilities construction  
5 account before any funds may be obligated from such ac-  
6 count for such project.”.

7 **SEC. 205. REPEAL OF CERTAIN PROVISIONS.**

8       (a) TECHNOLOGY INNOVATION PROGRAM.—

9           (1) IN GENERAL.—Section 28 of the National  
10 Institute of Standards and Technology Act (15  
11 U.S.C. 278n) is repealed.

12           (2) CONFORMING AMENDMENTS.—

13           (A) ADDITIONAL AWARD CRITERIA.—Sec-  
14 tion 4226(b) of the Small Business Jobs Act of  
15 2010 (15 U.S.C. 278n note) is repealed.

16           (B) MANAGEMENT COSTS.—Section 2(d) of  
17 the National Institute of Standards and Tech-  
18 nology Act (15 U.S.C. 272(d)) is amended by  
19 striking “sections 25, 26, and 28” and insert-  
20 ing “sections 25 and 26”.

21           (C) ANNUAL AND OTHER REPORTS TO  
22 SECRETARY AND CONGRESS.—Section 10(h)(1)  
23 of the National Institute of Standards and  
24 Technology Act (15 U.S.C. 278(h)(1)) is

1           amended by striking “, including the Program  
2           established under section 28,”.

3           (b) **TEACHERS FOR A COMPETITIVE TOMORROW.**—  
4 Sections 6111 through 6116 of the America COMPETES  
5 Act (20 U.S.C. 9811, 9812, 9813, 9814, 9815, 9816) and  
6 the items relating to those sections in the table of contents  
7 under section 2 of that Act (Public Law 110–69; 121 Stat.  
8 572) are repealed.

9           **SEC. 206. GRANT SUBRECIPIENT TRANSPARENCY AND**  
10                                   **OVERSIGHT.**

11           (a) **IN GENERAL.**—Not later than 1 year after the  
12 date of enactment of this Act, the Inspector General of  
13 the Foundation shall prepare and submit to the appro-  
14 priate committees of Congress an audit of the Founda-  
15 tion’s policies and procedures governing the monitoring of  
16 pass-through entities with respect to subrecipients.

17           (b) **CONTENTS.**—The audit shall include the fol-  
18 lowing:

19                   (1) Information regarding the Foundation’s  
20 process to oversee—

21                                   (A) the compliance of pass-through entities  
22 under section 200.331 and subpart F of part  
23 200 of chapter II of subtitle A of title 2, Code  
24 of Federal Regulations, and the other require-  
25 ments of that title for subrecipients;

1 (B) whether pass-through entities have  
2 processes and controls in place regarding finan-  
3 cial compliance of subrecipients, where appro-  
4 priate; and

5 (C) whether pass-through entities have  
6 processes and controls in place to maintain ap-  
7 proved grant objectives for subrecipients, where  
8 appropriate.

9 (2) Recommendations, if necessary, to increase  
10 transparency and oversight while balancing adminis-  
11 trative burdens.

12 **SEC. 207. MICRO-PURCHASE THRESHOLD FOR PROCURE-**  
13 **MENT SOLICITATIONS BY RESEARCH INSTI-**  
14 **TUTIONS.**

15 (a) MICRO-PURCHASE THRESHOLD.—The micro-pur-  
16 chase threshold for procurement activities administered  
17 under sections 6303 through 6305 of title 31, United  
18 States Code, awarded by the Foundation, the National  
19 Aeronautics and Space Administration, or the National  
20 Institute of Standards and Technology to institutions of  
21 higher education, or related or affiliated nonprofit entities,  
22 or to nonprofit research organizations or independent re-  
23 search institutes is—

24 (1) \$10,000 (as adjusted periodically to account  
25 for inflation); or



1           (2) such higher threshold as determined appro-  
2           priate by the head of the relevant executive agency  
3           and consistent with audit findings under chapter 75  
4           of title 31, United States Code, internal institutional  
5           risk assessment, or State law.

6           (b) UNIFORM GUIDANCE.—The Uniform Guidance  
7           shall be revised to conform with the requirements of this  
8           section. For purposes of the preceding sentence, the term  
9           “Uniform Guidance” means the uniform administrative  
10          requirements, cost principles, and audit requirements for  
11          Federal awards contained in part 200 of title 2 of the  
12          Code of Federal Regulations.

13       **SEC. 208. COORDINATION OF INTERNATIONAL SCIENCE**  
14                               **AND TECHNOLOGY PARTNERSHIPS.**

15          (a) SHORT TITLE.—This section may be cited as the  
16          “International Science and Technology Cooperation Act of  
17          2016”.

18          (b) ESTABLISHMENT.—The Director of the Office of  
19          Science and Technology Policy shall establish a body  
20          under the National Science and Technology Council with  
21          the responsibility to identify and coordinate international  
22          science and technology cooperation that can strengthen  
23          the United States science and technology enterprise, im-  
24          prove economic and national security, and support United  
25          States foreign policy goals.

1 (c) NSTC BODY LEADERSHIP.—The body estab-  
2 lished under subsection (b) shall be co-chaired by senior  
3 level officials from the Office of Science and Technology  
4 Policy and the Department of State.

5 (d) RESPONSIBILITIES.—The body established under  
6 subsection (b) shall—

7 (1) plan and coordinate interagency inter-  
8 national science and technology cooperative research  
9 and training activities and partnerships supported or  
10 managed by Federal agencies;

11 (2) work with other National Science and Tech-  
12 nology Council committees to help plan and coordi-  
13 nate the international component of national science  
14 and technology priorities;

15 (3) establish Federal priorities and policies for  
16 aligning, as appropriate, international science and  
17 technology cooperative research and training activi-  
18 ties and partnerships supported or managed by Fed-  
19 eral agencies with the foreign policy goals of the  
20 United States;

21 (4) identify opportunities for new international  
22 science and technology cooperative research and  
23 training partnerships that advance both the science  
24 and technology and the foreign policy priorities of  
25 the United States;

1           (5) in carrying out paragraph (4), solicit input  
2           and recommendations from non-Federal science and  
3           technology stakeholders, including institutions of  
4           higher education, scientific and professional soci-  
5           eties, industry, and other relevant organizations and  
6           institutions; and

7           (6) identify broad issues that influence the abil-  
8           ity of United States scientists and engineers to col-  
9           laborate with foreign counterparts, including bar-  
10          riers to collaboration and access to scientific infor-  
11          mation.

12          (e) REPORT TO CONGRESS.—The Director of the Of-  
13          fice of Science and Technology Policy shall submit to the  
14          Committee on Commerce, Science, and Transportation  
15          and the Committee on Foreign Relations of the Senate  
16          and the Committee on Science, Space, and Technology  
17          and the Committee on Foreign Affairs of the House of  
18          Representatives a biennial report on the requirements of  
19          this section.

20          (f) WEBSITE.—The Director shall make each report  
21          available to the public on the Office of Science and Tech-  
22          nology Policy website.

23          (g) TERMINATION.—The body established under sub-  
24          section (b) shall terminate on the date that is 10 years  
25          after the date of enactment of this Act.

1 (h) ADDITIONAL REPORTS TO CONGRESS.—The Di-  
2 rector of the Office of Science and Technology Policy shall  
3 submit, not later than 60 days after the date of enactment  
4 of this Act and annually thereafter, to the Committee on  
5 Commerce, Science, and Transportation and the Com-  
6 mittee on Foreign Relations of the Senate and the Com-  
7 mittee on Science, Space, and Technology and the Com-  
8 mittee on Foreign Affairs of the House of Representatives  
9 a report that lists and describes the details of all foreign  
10 travel by Office of Science and Technology Policy staff and  
11 detailees.

12 **TITLE III—SCIENCE, TECH-**  
13 **NOLOGY, ENGINEERING, AND**  
14 **MATH EDUCATION**

15 **SEC. 301. ROBERT NOYCE TEACHER SCHOLARSHIP PRO-**  
16 **GRAM UPDATE.**

17 Section 10A of the National Science Foundation Au-  
18 thorization Act of 2002 (42 U.S.C. 1862n–1a) is amended  
19 by adding at the end the following:

20 “(k) STEM TEACHER SERVICE AND RETENTION.—

21 “(1) IN GENERAL.—The Director shall develop  
22 and implement practices for increasing the propor-  
23 tion of individuals receiving fellowships under this  
24 section who—

1           “(A) fulfill the service obligation required  
2           under subsection (h); and

3           “(B) remain in the teaching profession in  
4           a high need local educational agency beyond the  
5           service obligation.

6           “(2) PRACTICES.—The practices described  
7           under paragraph (1) may include—

8           “(A) partnering with nonprofit or profes-  
9           sional associations or with other government en-  
10          tities to provide individuals receiving fellowships  
11          under this section with opportunities for profes-  
12          sional development, including mentorship pro-  
13          grams that pair those individuals with currently  
14          employed and recently retired science, tech-  
15          nology, engineering, mathematics, or computer  
16          science professionals;

17          “(B) increasing recruitment from high  
18          need districts;

19          “(C) establishing a system to better collect,  
20          track, and respond to data on the career deci-  
21          sions of individuals receiving fellowships under  
22          this section;

23          “(D) conducting research to better under-  
24          stand factors relevant to teacher service and re-  
25          tention, including factors specifically impacting

1 the retention of teachers who are individuals  
2 identified in sections 33 and 34 of the Science  
3 and Engineering Equal Opportunities Act (42  
4 U.S.C. 1885a, 1885b); and

5 “(E) conducting pilot programs to improve  
6 teacher service and retention.”.

7 **SEC. 302. SPACE GRANTS.**

8 (a) SENSE OF CONGRESS.—It is the sense of Con-  
9 gress that the National Space Grant College and Fellow-  
10 ship Program has been an important program by which  
11 the Federal Government has partnered with universities,  
12 colleges, industry, and other organizations to provide  
13 hands-on STEM experiences, fostering of multidisci-  
14 plinary space research, and supporting graduate fellow-  
15 ships in space-related fields, among other purposes.

16 (b) ADMINISTRATIVE COSTS.—Section 40303 of title  
17 51, United States Code, is amended by adding at the end  
18 the following:

19 “(d) PROGRAM ADMINISTRATION COSTS.—In car-  
20 rying out the provisions of this chapter, the Adminis-  
21 trator—

22 “(1) shall maximize appropriated funds for  
23 grants and contracts made under section 40304 in  
24 each fiscal year; and

1           “(2) in each fiscal year, the Administrator shall  
2           limit its program administration costs to no more  
3           than 5 percent of funds appropriated for this pro-  
4           gram for that fiscal year.

5           “(e) REPORTS.—For any fiscal year in which the Ad-  
6           ministrator cannot meet the administration cost target  
7           under subsection (d)(2), if the Administration is unable  
8           to limit program costs under subsection (b), the Adminis-  
9           trator shall submit to the appropriate committees of Con-  
10          gress a report, including—

11           “(1) a description of why the Administrator did  
12          not meet the cost target under subsection (d); and

13           “(2) the measures the Administrator will take  
14          in the next fiscal year to meet the cost target under  
15          subsection (d) without drawing upon other Federal  
16          funding.”.

17 **SEC. 303. STEM EDUCATION ADVISORY PANEL.**

18          (a) ESTABLISHMENT.—Not later than 180 days after  
19          the date of enactment this Act, the Director of the Foun-  
20          dation, Secretary of Education, Administrator of the Na-  
21          tional Aeronautics and Space Administration, and Admin-  
22          istrator of the National Oceanic and Atmospheric Admin-  
23          istration shall jointly establish an advisory panel (referred  
24          to in this section as the “STEM Education Advisory  
25          Panel”) to advise the Committee on STEM Education of

1 the National Science and Technology Council (referred to  
2 in this section as “CoSTEM”) on matters relating to  
3 STEM education.

4 (b) MEMBERS.—

5 (1) IN GENERAL.—The STEM Education Advi-  
6 sory Panel shall be composed of not less than 11  
7 members.

8 (2) APPOINTMENT.—

9 (A) IN GENERAL.—Subject to subpara-  
10 graph (B), the Director of the Foundation, in  
11 consultation with the Secretary of Education  
12 and the heads of the Federal science agencies,  
13 shall appoint the members of the STEM Edu-  
14 cation Advisory Panel.

15 (B) CONSIDERATION.—In selecting individ-  
16 uals to appoint under subparagraph (A), the  
17 Director of the Foundation shall seek and give  
18 consideration to recommendations from Con-  
19 gress, industry, the scientific community, in-  
20 cluding the National Academy of Sciences, sci-  
21 entific professional societies, academia, State  
22 and local governments, organizations rep-  
23 resenting individuals identified in section 33 or  
24 section 34 of the Science and Engineering  
25 Equal Opportunities Act (42 U.S.C. 1885a,



1 1885b), and such other organizations as the Di-  
2 rector considers appropriate.

3 (C) QUALIFICATIONS.—Members shall—

4 (i) primarily be individuals from aca-  
5 demic institutions, nonprofit organizations,  
6 and industry, including in-school, out-of-  
7 school, and informal education practi-  
8 tioners; and

9 (ii) be individuals who are qualified to  
10 provide advice and information on STEM  
11 education research, development, training,  
12 implementation, interventions, professional  
13 development, or workforce needs or con-  
14 cerns.

15 (c) RESPONSIBILITIES.—

16 (1) IN GENERAL.—The STEM Education Advi-  
17 sory Panel shall—

18 (A) advise CoSTEM;

19 (B) periodically assess CoSTEM's progress  
20 in carrying out its responsibilities under section  
21 101(b) of the America COMPETES Reauthor-  
22 ization Act of 2010 (42 U.S.C. 6621(b)); and

23 (C) help identify any need or opportunity  
24 to update the strategic plan under section  
25 101(b) of that Act.

1           (2) CONSIDERATIONS.—In its advisory role, the  
2       STEM Education Advisory Panel shall consider—

3           (A) the management, coordination, and im-  
4       plementation of STEM education programs and  
5       activities across the Federal Government;

6           (B) the appropriateness of criteria used by  
7       Federal agencies to evaluate the effectiveness of  
8       Federal STEM education programs and activi-  
9       ties;

10          (C) whether societal and workforce con-  
11       cerns are adequately addressed by current Fed-  
12       eral STEM education programs and activities;

13          (D) how Federal agencies can incentivize  
14       institutions of higher education to improve re-  
15       tention of STEM students;

16          (E) ways to leverage private and nonprofit  
17       STEM investments and encourage public-pri-  
18       vate partnerships to strengthen STEM edu-  
19       cation and help build the STEM workforce  
20       pipeline;

21          (F) ways to incorporate workforce needs  
22       into Federal STEM education programs and  
23       activities, particularly for specific employment  
24       fields of national interest and employment fields  
25       experiencing high unemployment rates;

1 (G) ways to better vertically and hori-  
2 zontally integrate Federal STEM education  
3 programs and activities from pre-kindergarten  
4 through graduate study and the workforce, and  
5 from in-school to out-of-school in order to im-  
6 prove transitions for students moving through  
7 the STEM education and workforce pipelines;

8 (H) the extent to which Federal STEM  
9 education programs and activities are contrib-  
10 uting to recruitment and retention of individ-  
11 uals identified in sections 33 and 34 of the  
12 Science and Engineering Equal Opportunities  
13 Act (42 U.S.C. 1885a, 1885b) in the STEM  
14 education and workforce pipelines; and

15 (I) ways to encourage geographic diversity  
16 in the STEM education and the workforce pipe-  
17 lines.

18 (3) RECOMMENDATIONS.—The STEM Edu-  
19 cation Advisory Panel shall make recommendations  
20 to improve Federal STEM education programs and  
21 activities based on each assessment under paragraph  
22 (1)(B).

23 (d) FUNDING.—The Director of the Foundation, the  
24 Secretary of Education, the Administrator of the National  
25 Aeronautics and Space Administration, and the Adminis-

1 trator of the National Oceanic and Atmospheric Adminis-  
2 tration shall jointly make funds available on an annual  
3 basis to support the activities of the STEM Education Ad-  
4 visory Panel.

5 (e) REPORTS.—Not later than 1 year after the date  
6 of enactment of this Act, and after each assessment under  
7 subsection (c)(1)(B), the STEM Education Advisory  
8 Panel shall submit to the appropriate committees of Con-  
9 gress and CoSTEM a report on its assessment under that  
10 subsection and its recommendations under subsection  
11 (c)(3).

12 (f) TRAVEL EXPENSES OF NON-FEDERAL MEM-  
13 BERS.—

14 (1) IN GENERAL.—Non-Federal members of the  
15 STEM Education Advisory Panel, while attending  
16 meetings of the panel or while otherwise serving at  
17 the request of a co-chairperson away from their  
18 homes or regular places of business, may be allowed  
19 travel expenses, including per diem in lieu of subsist-  
20 ence, as authorized by section 5703 of title 5,  
21 United States Code, for individuals in the Govern-  
22 ment serving without pay.

23 (2) RULE OF CONSTRUCTION.—Nothing in this  
24 subsection shall be construed to prohibit members of  
25 the STEM Advisory Panel who are officers or em-

1 ployees of the United States from being allowed  
2 travel expenses, including per diem in lieu of subsist-  
3 ence, in accordance with existing law.

4 (g) TERMINATION.—The STEM Education Advisory  
5 Panel established under subsection (a) shall terminate on  
6 the date that is 5 years after the date that it is estab-  
7 lished.

8 **SEC. 304. COMMITTEE ON STEM EDUCATION.**

9 (a) RESPONSIBILITIES.—Section 101(b) of the Amer-  
10 ica COMPETES Reauthorization Act of 2010 (42 U.S.C.  
11 6621(b)) is amended—

12 (1) in paragraph (5)(D), by striking “; and”  
13 and inserting a semicolon;

14 (2) in paragraph (6), by striking the period at  
15 the end and inserting a semicolon; and

16 (3) by adding at the end the following:

17 “(7) collaborate with the STEM Education Ad-  
18 visory Panel established under section 303 of the  
19 American Innovation and Competitiveness Act and  
20 other outside stakeholders to ensure the engagement  
21 of the STEM education community;

22 “(8) review the measures used by a Federal  
23 agency to evaluate its STEM education activities  
24 and programs;

1           “(9) request and review feedback from States  
2           on how the States are utilizing Federal STEM edu-  
3           cation programs and activities; and

4           “(10) recommend the reform, termination, or  
5           consolidation of Federal STEM education activities  
6           and programs, taking into consideration the rec-  
7           ommendations of the STEM Education Advisory  
8           Panel.”.

9           (b) REPORTS.—Section 101 of the America COM-  
10          PETES Reauthorization Act of 2010 (42 U.S.C. 6621)  
11          is amended—

12           (1) by striking “(c) REPORT.—” and inserting  
13           “(d) REPORTS.—”;

14           (2) by striking “(b) RESPONSIBILITIES OF  
15           OSTP.—” and inserting “(c) RESPONSIBILITIES OF  
16           OSTP.—”; and

17           (3) in subsection (d), as redesignated—

18           (A) in paragraph (4), by striking “; and”  
19           and inserting a semicolon;

20           (B) in paragraph (5), by striking the pe-  
21           riod at the end and inserting a semicolon; and

22           (C) by adding at the end the following:

23           “(6) a description of all consolidations and ter-  
24           minations of Federal STEM education programs  
25           and activities implemented in the previous fiscal

1 year, including an explanation for the consolidations  
2 and terminations;

3 “(7) recommendations for reforms, consolida-  
4 tions, and terminations of STEM education pro-  
5 grams or activities in the upcoming fiscal year; and

6 “(8) a description of any significant new STEM  
7 education public-private partnerships.”.

8 **SEC. 305. PROGRAMS TO EXPAND STEM OPPORTUNITIES.**

9 (a) FINDINGS.—Congress makes the following find-  
10 ings:

11 (1) Economic projections by the Bureau of  
12 Labor Statistics indicate that by 2018, there could  
13 be 2,400,000 unfilled STEM jobs.

14 (2) Women represent slightly more than half  
15 the United States population, and projections indi-  
16 cate that 54 percent of the population will be a  
17 member of a racial or ethnic minority group by  
18 2050.

19 (3) Despite representing half the population,  
20 women comprise only about 30 percent of STEM  
21 workers according to a 2015 report by the National  
22 Center for Science and Engineering Statistics.

23 (4) A 2014 National Center for Education Sta-  
24 tistics study found that underrepresented popu-

1       lations leave the STEM fields at higher rates than  
2       their counterparts.

3           (5) The representation of women in STEM  
4       drops significantly at the faculty level. Overall,  
5       women hold only 25 percent of all tenured and ten-  
6       ure-track positions and 17 percent of full professor  
7       positions in STEM fields in our Nation's universities  
8       and 4-year colleges.

9           (6) Black and Hispanic faculty together hold  
10      about 6.5 percent of all tenured and tenure-track po-  
11      sitions and 5 percent of full professor positions.

12          (7) Many of the numbers in the American In-  
13      dian or Alaskan Native and Native Hawaiian or  
14      Other Pacific Islander categories for different fac-  
15      ulty ranks were too small for the Foundation to re-  
16      port publicly without potentially compromising con-  
17      fidential information about the individuals being sur-  
18      veyed.

19      (b) SENSE OF CONGRESS.—It is the sense of Con-  
20      gress that—

21          (1) it is critical to our Nation's economic lead-  
22      ership and global competitiveness that the United  
23      States educate, train, and retain more scientists, en-  
24      gineers, and computer scientists;



1           (2) there is currently a disconnect between the  
2           availability of and growing demand for STEM-  
3           skilled workers;

4           (3) historically, underrepresented populations  
5           are the largest untapped STEM talent pools in the  
6           United States; and

7           (4) given the shifting demographic landscape,  
8           the United States should encourage full participation  
9           of individuals from underrepresented populations in  
10          STEM fields.

11          (c) REAFFIRMATION.—The Director of the Founda-  
12          tion shall continue to support programs designed to broad-  
13          en participation of underrepresented populations in STEM  
14          fields.

15          (d) GRANTS TO BROADEN PARTICIPATION.—

16                (1) IN GENERAL.—The Director of the Founda-  
17                tion shall award grants on a competitive, merit-re-  
18                viewed basis, to eligible entities to increase the par-  
19                ticipation of underrepresented populations in STEM  
20                fields, including individuals identified in section 33  
21                or section 34 of the Science and Engineering Equal  
22                Opportunities Act (42 U.S.C. 1885a, 1885b).

23                (2) CENTER OF EXCELLENCE.—

24                    (A) IN GENERAL.—Grants awarded under  
25                    this subsection may include grants for the es-

1           tablishment of a Center of Excellence to collect,  
2           maintain, and disseminate information to in-  
3           crease participation of underrepresented popu-  
4           lations in STEM fields.

5           (B) PURPOSE.—The purpose of a Center  
6           of Excellence under this subsection is to pro-  
7           mote diversity in STEM fields by building on  
8           the success of the INCLUDES programs, pro-  
9           viding technical assistance, maintaining best  
10          practices, and providing related training at fed-  
11          erally funded academic institutions.

12       (e) ACCOUNTABILITY AND DISSEMINATION.—

13           (1) EVALUATION.—

14           (A) IN GENERAL.—Not later than 5 years  
15           after the date of enactment of this Act, the Di-  
16           rector of the Foundation shall evaluate the  
17           grants provided under this section.

18           (B) REQUIREMENTS.—In conducting the  
19           evaluation under subparagraph (A), the Direc-  
20           tor shall—

21                   (i) use a common set of benchmarks  
22                   and assessment tools to identify best prac-  
23                   tices and materials developed or dem-  
24                   onstrated by the research; and

1 (ii) to the extent practicable, combine  
2 the research resulting from the grant activ-  
3 ity under subsection (e) with the current  
4 research on serving underrepresented stu-  
5 dents in grades kindergarten through 8.

6 (2) REPORT ON EVALUATIONS.—Not later than  
7 180 days after the completion of the evaluation  
8 under paragraph (1), the Director of the Foundation  
9 shall submit to the appropriate committees of Con-  
10 gress and make widely available to the public a re-  
11 port that includes—

12 (A) the results of the evaluation; and

13 (B) any recommendations for administra-  
14 tive and legislative action that could optimize  
15 the effectiveness of the program.

16 (f) COORDINATION.—In carrying out this section, the  
17 Director of the Foundation shall consult and cooperate  
18 with the programs and policies of other relevant Federal  
19 agencies to avoid duplication with and enhance the effec-  
20 tiveness of the program under this section.

21 **SEC. 306. NIST EDUCATION AND OUTREACH.**

22 (a) REPEAL.—The National Institute of Standards  
23 and Technology Act (15 U.S.C. 271 et seq.) is amended  
24 by striking section 18 (15 U.S.C. 278g–1).

1           (b) EDUCATION AND OUTREACH.—The National In-  
2 stitute of Standards and Technology Act (15 U.S.C. 271  
3 et seq.), as amended, is further amended by inserting after  
4 section 17, the following:

5 **“SEC. 18. EDUCATION AND OUTREACH.**

6           “(a) IN GENERAL.—The Director is authorized to ex-  
7 pend funds appropriated for activities of the Institute in  
8 any fiscal year, to support, promote, and coordinate activi-  
9 ties and efforts to enhance public awareness and under-  
10 standing of measurement sciences, standards and tech-  
11 nology at the national measurement laboratories and oth-  
12 erwise in fulfillment of the mission of the Institute. The  
13 Director may carry out activities under this subsection,  
14 including education and outreach activities to the general  
15 public, industry and academia in support of the Institute’s  
16 mission.

17           “(b) HIRING.—The Director, in coordination with the  
18 Director of the Office of Personnel Management, may re-  
19 vise the procedures the Director applies when making ap-  
20 pointments to laboratory positions within the competitive  
21 service—

22                   “(1) to ensure corporate memory of and exper-  
23 tise in the fundamental ongoing work, and on devel-  
24 oping new capabilities in priority areas;

1           “(2) to maintain high overall technical com-  
2           petence;

3           “(3) to improve staff diversity;

4           “(4) to balance emphases on the noncore and  
5           core areas; or

6           “(5) to improve the ability of the Institute to  
7           compete in the marketplace for qualified personnel.

8           “(c) VOLUNTEERS.—

9           “(1) IN GENERAL.—The Director may establish  
10          a program to use volunteers in carrying out the pro-  
11          grams of the Institute.

12          “(2) ACCEPTANCE OF PERSONNEL.—The Direc-  
13          tor may accept, subject to regulations issued by the  
14          Office of Personnel Management, voluntary service  
15          for the Institute for such purpose if the service—

16                 “(A) is to be without compensation; and

17                 “(B) will not be used to displace any cur-  
18          rent employee or act as a substitute for any fu-  
19          ture full-time employee of the Institute.

20          “(3) FEDERAL EMPLOYEE STATUS.—Any indi-  
21          vidual who provides voluntary service under this sub-  
22          section shall not be considered a Federal employee,  
23          except for purposes of chapter 81 of title 5, United  
24          States Code (relating to compensation for injury),

1 and sections 2671 through 2680 of title 28, United  
2 States Code (relating to tort claims).

3 “(d) RESEARCH FELLOWSHIPS.—

4 “(1) IN GENERAL.—The Director may expend  
5 funds appropriated for activities of the Institute in  
6 any fiscal year, as the Director considers appro-  
7 priate, for awards of research fellowships and other  
8 forms of financial and logistical assistance, including  
9 direct stipend awards to—

10 “(A) students at institutions of higher  
11 learning within the United States who show  
12 promise as present or future contributors to the  
13 mission of the Institute; and

14 “(B) United States citizens for research  
15 and technical activities of the Institute, includ-  
16 ing programs.

17 “(2) SELECTION CRITERIA.—The selection of  
18 persons to receive such fellowships and assistance  
19 shall be made on the basis of ability and of the rel-  
20 evance of the proposed work to the mission and pro-  
21 grams of the Institute.

22 “(3) FINANCIAL AND LOGISTICAL ASSIST-  
23 ANCE.—Notwithstanding section 1345 of title 31,  
24 United States Code, or any other law to the con-  
25 trary, the Director may include as a form of finan-

1 cial or logistical assistance under this subsection  
2 temporary housing and transportation to and from  
3 Institute facilities.

4 “(e) EDUCATIONAL OUTREACH ACTIVITIES.—The  
5 Director may—

6 “(1) facilitate education programs for under-  
7 graduate and graduate students, postdoctoral re-  
8 searchers, and academic and industry employees;

9 “(2) sponsor summer workshops for STEM kin-  
10 dergarten through grade 12 teachers as appropriate;

11 “(3) develop programs for graduate student in-  
12 ternships and visiting faculty researchers;

13 “(4) document publications, presentations, and  
14 interactions with visiting researchers and sponsoring  
15 interns as performance metrics for improving and  
16 continuing interactions with those individuals; and

17 “(5) facilitate laboratory tours and provide  
18 presentations for educational, industry, and commu-  
19 nity groups.”.

20 (e) POST-DOCTORAL FELLOWSHIP PROGRAM.—Sec-  
21 tion 19 of the National Institute of Standards and Tech-  
22 nology Act (15 U.S.C. 278g–2) is amended to read as fol-  
23 lows:

1 **“SEC. 19. POST-DOCTORAL FELLOWSHIP PROGRAM.**

2 “(a) IN GENERAL.—The Institute and the National  
3 Academy of Sciences, jointly, shall establish and conduct  
4 a post-doctoral fellowship program, subject to the avail-  
5 ability of appropriations.

6 “(b) ORGANIZATION.—The post-doctoral fellowship  
7 program shall include not less than 20 new fellows per  
8 fiscal year.

9 “(c) EVALUATIONS.—In evaluating applications for  
10 post-doctoral fellowships under this section, the Director  
11 of the Institute and the President of the National Acad-  
12 emy of Sciences shall give consideration to the goal of pro-  
13 moting the participation of individuals identified in sec-  
14 tions 33 and 34 of the Science and Engineering Equal  
15 Opportunities Act (42 U.S.C. 1885a, 1885b) in research  
16 areas supported by the Institute.”.

17 (d) SAVINGS CLAUSES.—

18 (1) RESEARCH FELLOWSHIPS AND OTHER FI-  
19 NANCIAL ASSISTANCE TO STUDENTS AT INSTITUTES  
20 OF HIGHER EDUCATION.—The repeal made by sub-  
21 section (a) of this section shall not affect any award  
22 of a research fellowship or other form of financial  
23 assistance made under section 18 of the National In-  
24 stitute of Standards and Technology Act (15 U.S.C.  
25 278g-1) before the date of enactment of this Act.  
26 Such award shall continue to be subject to the re-



1 requirements to which such funds were subject under  
2 that section before the date of enactment of this Act.

3 (2) POST-DOCTORAL FELLOWSHIP PROGRAM.—

4 The amendment made by subsection (c) of this sec-  
5 tion shall not affect any award of a post-doctoral fel-  
6 lowship or other form of financial assistance made  
7 under section 19 of the National Institute of Stand-  
8 ards and Technology Act (15 U.S.C. 278g–2) before  
9 the date of enactment of this Act. Such awards shall  
10 continue to be subject to the requirements to which  
11 such funds were subject under that section before  
12 the date of enactment of this Act.

13 **SEC. 307. PRESIDENTIAL AWARDS FOR EXCELLENCE IN**  
14 **STEM MENTORING.**

15 (a) IN GENERAL.—The Director of the Foundation  
16 shall continue to administer awards on behalf of the Office  
17 of Science and Technology Policy to recognize outstanding  
18 mentoring in STEM fields.

19 (b) ANNUAL AWARD RECIPIENTS.—The Director of  
20 the Foundation shall provide Congress with a list of award  
21 recipients, including the name, institution, and a brief syn-  
22 oopsis of the impact of the mentoring efforts.

1 **SEC. 308. WORKING GROUP ON INCLUSION IN STEM**  
2 **FIELDS.**

3 (a) ESTABLISHMENT.—The Office of Science and  
4 Technology Policy, in collaboration with Federal depart-  
5 ments and agencies, shall establish an interagency work-  
6 ing group to compile and summarize available research  
7 and best practices on how to promote diversity and inclu-  
8 sions in STEM fields and examine whether barriers exist  
9 to promoting diversity and inclusion within Federal agen-  
10 cies employing scientists and engineers.

11 (b) RESPONSIBILITIES.—The working group shall be  
12 responsible for reviewing and assessing research, best  
13 practices, and policies across Federal science agencies re-  
14 lated to the inclusion of individuals identified in sections  
15 33 and 34 of the Science and Engineering Equal Opportu-  
16 nities Act (42 U.S.C. 1885a, 1885b) in the Federal STEM  
17 workforce, including available research and best practices  
18 on how to promote diversity and inclusion in STEM fields,  
19 including—

20 (1) policies providing flexibility for scientists  
21 and engineers that are also caregivers, particularly  
22 on the timing of research grants;

23 (2) policies to address the proper handling of  
24 claims of sexual harassment;

1           (3) policies to minimize the effects of implicit  
2 bias and other systemic factors in hiring, promotion,  
3 evaluation and the workplace in general; and

4           (4) other evidence-based strategies that the  
5 working group considers effective for promoting di-  
6 versity and inclusion in the STEM fields.

7           (c) **STAKEHOLDER INPUT.**—In carrying out the re-  
8 sponsibilities under section (b), the working group shall  
9 solicit and consider input and recommendations from non-  
10 Federal stakeholders, including—

11           (1) the Council of Advisors on Science and  
12 Technology;

13           (2) federally funded and nonfederally funded re-  
14 searchers, institutions of higher education, scientific  
15 disciplinary societies, and associations;

16           (3) nonprofit research institutions;

17           (4) industry, including small businesses;

18           (5) federally funded research and development  
19 centers;

20           (6) nongovernmental organizations; and

21           (7) such other members of the public interested  
22 in promoting a diverse and inclusive Federal STEM  
23 workforce.

24           (d) **PUBLIC REPORTS.**—Not later than 1 year after  
25 the date of enactment of this Act, and periodically there-

1 after, the working group shall publish a report on the re-  
2 view and assessment under subsection (b), including a  
3 summary of available research and best practices, any rec-  
4 ommendations for Federal actions to promote a diverse  
5 and inclusive Federal STEM workforce, and updates on  
6 the implementation of previous recommendations for Fed-  
7 eral actions.

8 (e) TERMINATION.—The interagency working group  
9 established under subsection (a) shall terminate on the  
10 date that is 10 years after the date that it is established.

11 **SEC. 309. IMPROVING UNDERGRADUATE STEM EXPERI-**  
12 **ENCES.**

13 (a) SENSE OF CONGRESS.—It is the sense of Con-  
14 gress that each Federal science agency should invest in  
15 and expand research opportunities for undergraduate stu-  
16 dents attending institutions of higher education during the  
17 undergraduate students' first 2 academic years of postsec-  
18 ondary education.

19 (b) IDENTIFICATION OF RESEARCH PROGRAMS.—  
20 Not later than 1 year after the date of enactment of this  
21 Act, the head of each Federal agency shall submit to the  
22 President recommendations regarding how the agency  
23 could best fulfill the goals described in subsection (a).

1 **SEC. 310. COMPUTER SCIENCE EDUCATION RESEARCH.**

2 (a) FINDINGS.—Congress finds that as the lead Fed-  
3 eral agency for building the research knowledge base for  
4 computer science education, the Foundation is well posi-  
5 tioned to make investments that will accelerate ongoing  
6 efforts to enable rigorous and engaging computer science  
7 throughout the Nation as an integral part of STEM edu-  
8 cation.

9 (b) GRANT PROGRAM.—

10 (1) IN GENERAL.—The Director of the Founda-  
11 tion shall award grants to eligible entities to re-  
12 search computer science education and computa-  
13 tional thinking.

14 (2) RESEARCH.—The research described in  
15 paragraph (1) may include the development or adap-  
16 tation, piloting or full implementation, and testing  
17 of—

18 (A) models of preservice preparation for  
19 teachers who will teach computer science and  
20 computational thinking;

21 (B) scalable and sustainable models of pro-  
22 fessional development and ongoing support for  
23 the teachers described in subparagraph (A);

24 (C) tools and models for teaching and  
25 learning aimed at supporting student success  
26 and inclusion in computing within and across

1           diverse populations, particularly poor, rural,  
2           and tribal populations and other populations  
3           that have been historically underrepresented in  
4           computer science and STEM fields; and

5                   (D) high-quality learning opportunities for  
6           teaching computer science and, especially in  
7           poor, rural, or tribal schools at the elementary  
8           school and middle school levels, for integrating  
9           computational thinking into STEM teaching  
10          and learning.

11          (c) COLLABORATIONS.—In carrying out the grants  
12          established in subsection (b), eligible entities may collabo-  
13          rate and partner with local or remote schools to support  
14          the integration of computing and computational thinking  
15          within pre-kindergarten through grade 12 STEM cur-  
16          ricula and instruction.

17          (d) METRICS.—The Director of the Foundation shall  
18          develop metrics to measure the success of the grant pro-  
19          gram funded under this section in achieving program  
20          goals.

21          (e) REPORT.—The Director of the Foundation shall  
22          report, in the annual budget submission to Congress, on  
23          the success of the program as measured by the metrics  
24          in subsection (d).

1 (f) DEFINITION OF ELIGIBLE ENTITY.—In this sec-  
2 tion, the term “eligible entity” means an institution of  
3 higher education or a nonprofit research organization.

4 **SEC. 311. INFORMAL STEM EDUCATION.**

5 (a) NATIONAL STEM PARTNERSHIP GRANTS.—Sec-  
6 tion 3(a) of the STEM Education Act of 2015 (42 U.S.C.  
7 1862q(a)) is amended—

8 (1) in paragraph (1), by striking “; and” and  
9 inserting a semicolon;

10 (2) in paragraph (2), by striking the period at  
11 the end and inserting “; and”; and

12 (3) by adding at the end the following:

13 “(3) a national partnership of institutions in-  
14 volved in informal STEM learning.”.

15 (b) USE OF FUNDS.—Section 3(b) of the STEM  
16 Education Act of 2015 (42 U.S.C. 1862q(b)) is amend-  
17 ed—

18 (1) in paragraph (1), by striking “; and” and  
19 inserting a semicolon;

20 (2) in paragraph (2), by striking the period at  
21 the end and inserting a semicolon; and

22 (3) by adding at the end the following:

23 “(3) fostering on-going partnerships between  
24 institutions involved in informal STEM learning, in-

1       stitutions of higher education, and education re-  
2       search centers; and

3               “(4) developing, and making available informal  
4       STEM education activities and educational mate-  
5       rials.”.

6       **SEC. 312. DEVELOPING STEM APPRENTICESHIPS.**

7       (a) FINDINGS.—Congress makes the following find-  
8       ings:

9               (1) The lack of data on the return on invest-  
10       ment for United States employers using registered  
11       apprenticeships makes it difficult—

12                       (A) to communicate the value of these pro-  
13       grams to businesses; and

14                       (B) to expand registered apprenticeships.

15               (2) The lack of data on the value and impact  
16       of employer-provided worker training, which is likely  
17       substantial, hinders the ability of the Federal Gov-  
18       ernment to formulate policy related to workforce  
19       training.

20               (3) The Secretary of Commerce has initiated—

21                       (A) the first study on the return on invest-  
22       ment for United States employers using reg-  
23       istered apprenticeships through case studies of  
24       firms in various sectors, occupations, and geo-  
25       graphic locations to provide the business com-



1 munity with data on employer benefits and  
2 costs; and

3 (B) discussions with officials at relevant  
4 Federal agencies about the need to collect com-  
5 prehensive data on—

6 (i) employer-provided worker training;

7 and

8 (ii) existing tools that could be used  
9 to collect such data.

10 (b) DEVELOPMENT OF APPRENTICESHIP INFORMA-  
11 TION.—The Secretary of Commerce shall continue to re-  
12 search the value to businesses of utilizing apprenticeship  
13 programs, including—

14 (1) evidence of return on investment of appren-  
15 ticeships, including estimates for the average time it  
16 takes a business to recover the costs associated with  
17 training apprentices; and

18 (2) data from the United States Census Bureau  
19 and other statistical surveys on employer-provided  
20 training, including apprenticeships and other on-the-  
21 job training and industry-recognized certification  
22 programs.

23 (c) DISSEMINATION OF APPRENTICESHIP INFORMA-  
24 TION.—The Secretary of Commerce shall disseminate

1 findings from research on apprenticeships to businesses  
2 and other relevant stakeholders, including—

- 3 (1) institutions of higher education;
- 4 (2) State and local chambers of commerce; and
- 5 (3) workforce training organizations.

6 (d) **NEW APPRENTICESHIP PROGRAM STUDY.**—The  
7 Secretary of Commerce may collaborate with the Secretary  
8 of Labor to study approaches for reducing the cost of cre-  
9 ating new apprenticeship programs and hosting appren-  
10 tices for businesses, particularly small businesses, includ-  
11 ing—

- 12 (1) training sharing agreements;
- 13 (2) group training models; and
- 14 (3) pooling resources and best practices.

15 (e) **ECONOMIC DEVELOPMENT ADMINISTRATION**  
16 **GRANTS.**—The Stevenson-Wydler Technology Innovation  
17 Act of 1980 (15 U.S.C. 3701 et seq.) is amended by add-  
18 ing at the end the following:

19 **“SEC. 28. STEM APPRENTICESHIP PROGRAMS.**

20 “(a) **IN GENERAL.**—The Secretary of Commerce may  
21 carry out a grant program to identify the need for skilled  
22 science, technology, engineering, and mathematics (re-  
23 ferred to in this section as ‘STEM’) workers and to ex-  
24 pand STEM apprenticeship programs.

1       “(b) ELIGIBLE RECIPIENT DEFINED.—In this sec-  
2 tion, the term ‘eligible recipient’ means—

3           “(1) a State;

4           “(2) an Indian tribe;

5           “(3) a city or other political subdivision of a  
6 State;

7           “(4) an entity that—

8               “(A) is a nonprofit organization, an insti-  
9 tution of higher education, a public-private  
10 partnership, a science or research park, a Fed-  
11 eral laboratory, or an economic development or-  
12 ganization or similar entity; and

13               “(B) has an application that is supported  
14 by a State, a political subdivision of a State, or  
15 a native organization; or

16           “(5) a consortium of any of the entities de-  
17 scribed in paragraphs (1) through (5).

18       “(c) NEEDS ASSESSMENT GRANTS.—The Secretary  
19 of Commerce may provide a grant to an eligible recipient  
20 to conduct a needs assessment to identify—

21           “(1) the unmet need of a region’s employer  
22 base for skilled STEM workers;

23           “(2) the potential of STEM apprenticeships to  
24 address the unmet need described in paragraph (1);

25       and

1           “(3) any barriers to addressing the unmet need  
2           described in paragraph (1).

3           “(d) APPRENTICESHIP EXPANSION GRANTS.—The  
4           Secretary of Commerce may provide a grant to an eligible  
5           recipient that has conducted a needs assessment as de-  
6           scribed in subsection (c)(1) to develop infrastructure to  
7           expand STEM apprenticeship programs.”.

8           **SEC. 313. NSF REPORT ON BROADENING PARTICIPATION.**

9           Section 204(e) of the National Science Foundation  
10          Authorization Act of 1988 (42 U.S.C. 1885c(e)) is amend-  
11          ed to read as follows:

12          “(e) BIENNIAL REPORT.—Every 2 years, the Com-  
13          mittee shall prepare and submit to the Director a report  
14          on its activities during the previous 2 years and proposed  
15          activities for the next 2 years. The Director shall submit  
16          to Congress the report, unaltered, together with such com-  
17          ments as the Director considers appropriate, including—

18                  “(1) review data on the participation in Foun-  
19                  dation activities of institutions serving populations  
20                  that are underrepresented in STEM disciplines, in-  
21                  cluding poor, rural, and tribal populations; and

22                  “(2) recommendations regarding how the Foun-  
23                  dation could improve outreach and inclusion of these  
24                  populations in Foundation activities.”.

1 **SEC. 314. NOAA SCIENCE EDUCATION PROGRAMS.**

2 (a) IN GENERAL.—Section 4002(a) of the America  
3 COMPETES Act (33 U.S.C. 893a(a)) is amended by  
4 striking “agency, with consideration given to the goal of  
5 promoting the participation of individuals from underrep-  
6 resented groups” and inserting “the agency, with consid-  
7 eration given to the goal of promoting the participation  
8 of individuals identified in sections 33 and 34 of the  
9 Science and Engineering Equal Opportunities Act (42  
10 U.S.C. 1885a, 1885b)”.

11 (b) EDUCATIONAL PROGRAM GOALS.—Section  
12 4002(b)(4) of the America COMPETES Act (33 U.S.C.  
13 893a(b)(4)) is amended—

14 (1) in subparagraph (B), by striking “and” at  
15 the end;

16 (2) by redesignating subparagraph (C) as sub-  
17 paragraph (D);

18 (3) by inserting after subparagraph (B) the fol-  
19 lowing:

20 “(C) are designed considering the unique  
21 needs of underrepresented groups, translating  
22 such materials and other resources;” and

23 (4) by adding at the end the following:

24 “(E) are promoted widely, especially  
25 among individuals identified in sections 33 and  
26 34 of the Science and Engineering Equal Op-

1           portunities Act (42 U.S.C. 1885a, 1885b);  
2           and”.

3           (c) METRICS.—Section 4002 of the America COM-  
4 PETES Act (33 U.S.C. 893a) is amended—

5           (1) by redesignating subsections (d) and (e) as  
6           subsections (e) and (f), respectively; and

7           (2) by adding after subsection (c) the following:

8           “(d) METRICS.—In executing the National Oceanic  
9 and Atmospheric Administration science education plan  
10 under subsection (c), the Administrator shall maintain a  
11 comprehensive system for evaluating the Administration’s  
12 educational programs and activities. In so doing, the Ad-  
13 ministrator shall ensure that such education programs  
14 have measurable objectives and milestones as well as clear,  
15 documented metrics for evaluating programs. For each  
16 such education program or portfolio of similar programs,  
17 the Administrator shall—

18           “(1) encourage the collection of evidence as rel-  
19 evant to the measurable objectives and milestones;  
20 and

21           “(2) ensure that program or portfolio evalua-  
22 tions focus on educational outcomes and not just in-  
23 puts, activities completed, or the number of partici-  
24 pants.”.

1 **SEC. 315. HISPANIC-SERVING INSTITUTIONS UNDER-**  
2 **GRADUATE PROGRAM UPDATE.**

3 (a) IN GENERAL.—Section 7033(a) of the America  
4 COMPETES Act (42 U.S.C. 1862o–12(a)) is amended as  
5 follows:

6 “(a) IN GENERAL.—The Director shall award grants  
7 on a competitive, merit-reviewed basis to Hispanic-serving  
8 institutions (as defined in section 502 of the Higher Edu-  
9 cation Act of 1965 (20 U.S.C. 1101a)) to enhance the  
10 quality of undergraduate STEM education at such institu-  
11 tions and to increase the retention and graduation rates  
12 of students pursuing associate’s or baccalaureate degrees  
13 in science, technology, engineering, and mathematics.”.

14 (b) SAVINGS PROVISION.—The amendment made by  
15 subsection (a) of this section shall not affect any award  
16 of a grant or other form of financial assistance made  
17 under section 7033 of the America COMPETES Act (42  
18 U.S.C. 1862o–12) before the date of enactment of this  
19 Act. Such awards shall continue to be subject to the re-  
20 quirements to which such funds were subject under that  
21 section before the date of enactment of this Act.

22 **TITLE IV—LEVERAGING THE**  
23 **PRIVATE SECTOR**

24 **SEC. 401. PRIZE COMPETITION AUTHORITY UPDATE.**

25 (a) SHORT TITLE.—This section may be cited as the  
26 “Science Prize Competition Act”.

1 (b) IN GENERAL.—Section 24 of the Stevenson-  
2 Wydler Technology Innovation Act of 1980 (15 U.S.C.  
3 3719) is amended—

4 (1) in subsection (c)—

5 (A) in the subsection heading, by striking  
6 “PRIZES” and by inserting “PRIZE COMPETI-  
7 TIONS”;

8 (B) in the matter preceding paragraph (1),  
9 by striking “prize may be one or more of the  
10 following” and inserting “prize competition may  
11 be one or more of the following types of activi-  
12 ties”;

13 (C) in paragraph (2), by inserting “com-  
14 petition” after “prize”; and

15 (D) in paragraphs (3) and (4), by striking  
16 “prizes” and inserting “prize competitions”;

17 (2) in subsection (f)—

18 (A) in the matter preceding paragraph (1),  
19 by striking “in the Federal Register” and in-  
20 serting “on a publicly accessible Government  
21 website, such as [www.challenge.gov](http://www.challenge.gov),”;

22 (B) in paragraphs (1), (2), and (3), by in-  
23 serting “prize” before “competition”; and



1 (C) in paragraph (4), by striking “prize”  
2 and inserting “cash prize purse or non-cash  
3 prize award”;

4 (3) in subsection (g)—

5 (A) in the matter preceding paragraph (1),  
6 by striking “prize” and inserting “cash prize  
7 purse”; and

8 (B) in paragraph (1), by inserting “prize”  
9 before “competition”;

10 (4) in subsection (h), by inserting “prize” be-  
11 fore “competition” each place it appears;

12 (5) in subsection (i)—

13 (A) in paragraph (1)(B), by inserting  
14 “prize” before “competition”;

15 (B) in paragraph (2)(A), by inserting  
16 “prize” before “competition” each place it ap-  
17 pears;

18 (C) by redesignating paragraph (3) as  
19 paragraph (4); and

20 (D) by inserting after paragraph (2) the  
21 following:

22 “(3) WAIVERS.—

23 “(A) IN GENERAL.—An agency may waive  
24 the requirement under paragraph (2).

1           “(B) LIST.—The Director shall include a  
2 list of all of the waivers granted under this  
3 paragraph during the preceding fiscal year, in-  
4 cluding a detailed explanation of the reason for  
5 granting the waiver.”;

6           (6) in subsection (j)—

7                 (A) in paragraph (1), by inserting “prize”  
8 before “competition”; and

9                 (B) by amending paragraph (2) to read as  
10 follows:

11           “(2) LICENSES.—As appropriate and to further  
12 the goals of a prize competition, the Federal Govern-  
13 ment may negotiate a license for the use of intellec-  
14 tual property developed by a registered participant  
15 in a prize competition.”;

16           (7) in subsection (k)—

17                 (A) in paragraph (1), by striking “each  
18 competition” and inserting “each prize competi-  
19 tion” each place it appears;

20                 (B) in paragraph (2)(A), by inserting  
21 “prize” before “competition”; and

22                 (C) in paragraph (3), by inserting “prize”  
23 before “competitions” each place it appears;

24           (8) in subsection (l), by striking “an agreement  
25 with” and all that follows through the period at the

1 end and inserting “a grant, contract, cooperative  
2 agreement, or other agreement with a private sector  
3 for-profit or nonprofit entity or State or local gov-  
4 ernment agency to administer the prize competition,  
5 subject to the provisions of this section.”;

6 (9) in subsection (m)—

7 (A) by amending paragraph (1) to read as  
8 follows:

9 “(1) IN GENERAL.—Support for a prize com-  
10 petition under this section, including financial sup-  
11 port for the design and administration of a prize  
12 competition or funds for a cash prize purse, may  
13 consist of Federal appropriated funds and funds  
14 provided by private sector for-profit and nonprofit  
15 entities. The head of an agency may request and ac-  
16 cept funds from other Federal agencies, State,  
17 United States territory, local, or tribal government  
18 agencies, private sector for-profit entities, and non-  
19 profit entities, to be available to the extent provided  
20 by appropriations Acts, to support such prize com-  
21 petitions. The head of an agency may not give any  
22 special consideration to any agency or entity in re-  
23 turn for a donation.”;

1 (B) in paragraph (2), by striking “prize  
2 awards” and inserting “cash prize purses or  
3 non-cash prize awards”;

4 (C) in paragraph (3)—

5 (i) by amending subparagraph (A) to  
6 read as follows:

7 “(A) ANNOUNCEMENT.—No prize competi-  
8 tion may be announced under subsection (f)  
9 until all the funds needed to pay out the an-  
10 nounced amount of the cash prize purse have  
11 been appropriated or committed in writing by a  
12 private or State, United States territory, local,  
13 or tribal government source.”; and

14 (ii) in subparagraph (B)—

15 (I) in the matter preceding clause  
16 (i), by striking “a prize” and inserting  
17 “a cash prize purse or non-cash prize  
18 award”;

19 (II) in clause (i), by inserting  
20 “competition” after “prize”; and

21 (III) in clause (ii), by inserting  
22 “or State, United States territory,  
23 local, or tribal government” after  
24 “private”; and

25 (D) in paragraph (4)—

1 (i) in subparagraph (A)—

2 (I) by striking “a prize” and in-  
3 serting “a cash prize purse or a non-  
4 cash prize award”; and

5 (II) by striking “Science and  
6 Technology” and inserting “Science,  
7 Space, and Technology”; and

8 (ii) in subparagraph (B), by striking  
9 “cash prizes” and inserting “cash prize  
10 purses or non-cash prize awards”;

11 (10) in subsection (n)—

12 (A) in the heading, by striking “SERVICE”  
13 and inserting “SERVICES”;

14 (B) by striking “the date of the enactment  
15 of the America COMPETES Reauthorization  
16 Act of 2010,” and inserting “the date of enact-  
17 ment of the American Innovation and Competi-  
18 tiveness Act,”; and

19 (C) by inserting “for both for-profit and  
20 nonprofit entities and State, United States ter-  
21 ritory, local, and tribal government entities,”  
22 after “contract vehicle”;

23 (11) in subsection (o)(1), by striking “or pro-  
24 viding a prize” and inserting “a prize competition or

1 providing a cash prize purse or non-cash prize  
2 award”; and

3 (12) in subsection (p)—

4 (A) in the heading, by striking “ANNUAL”  
5 and inserting “BIENNIAL”;

6 (B) in paragraph (1)—

7 (i) by striking “each year” and insert-  
8 ing “every other year”;

9 (ii) by striking “Science and Tech-  
10 nology” and inserting “Science, Space, and  
11 Technology”; and

12 (iii) by striking “fiscal year” and in-  
13 serting “2 fiscal years”; and

14 (C) in paragraph (2)—

15 (i) by striking “The report for a fiscal  
16 year” and inserting “A report”;

17 (ii) in subparagraph (C)—

18 (I) in the heading, by striking  
19 “PRIZES” and inserting “PRIZE  
20 PURSES OR NON-CASH PRIZE  
21 AWARDS”; and

22 (II) by striking “cash prizes”  
23 each place it appears and inserting  
24 “cash prize purses or non-cash prize  
25 awards”; and

1 (iii) by adding at the end the fol-  
2 lowing:

3 “(G) PLAN.—A description of crosscutting  
4 topical areas and agency-specific mission needs  
5 that may be the strongest opportunities for  
6 prize competitions during the upcoming 2 fiscal  
7 years.”.

8 **SEC. 402. CROWDSOURCING AND CITIZEN SCIENCE.**

9 (a) SHORT TITLE.—This section may be cited as the  
10 “Crowdsourcing and Citizen Science Act”.

11 (b) SENSE OF CONGRESS.—It is the sense of Con-  
12 gress that—

13 (1) the authority granted to Federal agencies  
14 under the America COMPETES Reauthorization  
15 Act of 2010 (Public Law 111–358; 124 Stat. 3982)  
16 to pursue the use of incentive prizes and challenges  
17 has yielded numerous benefits;

18 (2) crowdsourcing and citizen science projects  
19 have a number of additional unique benefits, includ-  
20 ing accelerating scientific research, increasing cost  
21 effectiveness to maximize the return on taxpayer dol-  
22 lars, addressing societal needs, providing hands-on  
23 learning in STEM, and connecting members of the  
24 public directly to Federal science agency missions  
25 and to each other; and

1           (3) granting Federal science agencies the direct,  
2           explicit authority to use crowdsourcing and citizen  
3           science will encourage its appropriate use to advance  
4           Federal science agency missions and stimulate and  
5           facilitate broader public participation in the innova-  
6           tion process, yielding numerous benefits to the Fed-  
7           eral Government and citizens who participate in  
8           such projects.

9           (c) DEFINITIONS.—In this section:

10           (1) CITIZEN SCIENCE.—The term “citizen  
11           science” means a form of open collaboration in  
12           which individuals or organizations participate volun-  
13           tarily in the scientific process in various ways, in-  
14           cluding—

15                   (A) enabling the formulation of research  
16                   questions;

17                   (B) creating and refining project design;

18                   (C) conducting scientific experiments;

19                   (D) collecting and analyzing data;

20                   (E) interpreting the results of data;

21                   (F) developing technologies and applica-  
22                   tions;

23                   (G) making discoveries; and

24                   (H) solving problems.



1           (2)           CROWDSOURCING.—The           term  
2           “crowdsourcing” means a method to obtain needed  
3           services, ideas, or content by soliciting voluntary  
4           contributions from a group of individuals or organi-  
5           zations, especially from an online community.

6           (3)   PARTICIPANT.—The term “participant”  
7           means any individual or other entity that has volun-  
8           teered in a crowdsourcing or citizen science project  
9           under this section.

10          (d) CROWDSOURCING AND CITIZEN SCIENCE.—

11           (1) IN GENERAL.—The head of each Federal  
12           science agency, or the heads of multiple Federal  
13           science agencies working cooperatively, may utilize  
14           crowdsourcing and citizen science to conduct  
15           projects designed to advance the mission of the re-  
16           spective Federal science agency or the joint mission  
17           of Federal science agencies, as applicable.

18           (2) VOLUNTARY SERVICES.—Notwithstanding  
19           section 1342 of title 31, United States Code, the  
20           head of a Federal science agency may accept, sub-  
21           ject to regulations issued by the Director of the Of-  
22           fice of Personnel Management, in coordination with  
23           the Director of the Office of Science and Technology  
24           Policy, services from participants under this section  
25           if such services—

1 (A) are performed voluntarily as a part of  
2 a crowdsourcing or citizen science project au-  
3 thorized under paragraph (1);

4 (B) are not financially compensated for  
5 their time; and

6 (C) will not be used to displace any em-  
7 ployee of the Federal Government.

8 (3) OUTREACH.—The head of each Federal  
9 science agency engaged in a crowdsourcing or citizen  
10 science project under this section shall make public  
11 and promote such project to encourage broad par-  
12 ticipation.

13 (4) CONSENT, REGISTRATION, AND TERMS OF  
14 USE.—

15 (A) IN GENERAL.—Each Federal science  
16 agency shall determine the appropriate level of  
17 consent, registration, or acknowledgment of the  
18 terms of use that are required from participants  
19 in crowdsourcing or citizen science projects  
20 under this section on a per-project basis.

21 (B) DISCLOSURES.—In seeking consent,  
22 conducting registration, or developing terms of  
23 use for a project under this subsection, a Fed-  
24 eral science agency shall disclose the privacy,  
25 intellectual property, data ownership, com-

1           pensation, service, program, and other terms of  
2           use to the participant in a clear and reasonable  
3           manner.

4           (C) MODE OF CONSENT.—A Federal agen-  
5           cy or Federal science agencies, as applicable,  
6           may obtain consent electronically or in written  
7           form from participants under this section.

8           (5) PROTECTIONS FOR HUMAN SUBJECTS.—  
9           Any crowdsourcing or citizen science project under  
10          this section that involves research involving human  
11          subjects shall be subject to part 46 of title 28, Code  
12          of Federal Regulations (or any successor regulation).

13          (6) DATA.—

14           (A) IN GENERAL.—A Federal science  
15           agency shall, where appropriate and to the ex-  
16           tent practicable, make data collected through a  
17           crowdsourcing or citizen science project under  
18           this section available to the public, in a machine  
19           readable format, unless prohibited by law.

20           (B) NOTICE.—As part of the consent proc-  
21           ess, the Federal science agency shall notify all  
22           participants—

23           (i) of the expected uses of the data  
24           compiled through the project;

1 (ii) if the Federal science agency will  
2 retain ownership of such data;

3 (iii) if and how the data and results  
4 from the project would be made available  
5 for public or third-party use; and

6 (iv) if participants are authorized to  
7 publish such data.

8 (7) TECHNOLOGIES AND APPLICATIONS.—Fed-  
9 eral science agencies shall endeavor to make tech-  
10 nologies, applications, code, and derivations of such  
11 intellectual property developed through a  
12 crowdsourcing or citizen science project under this  
13 section available to the public.

14 (8) LIABILITY.—Each participant in a  
15 crowdsourcing or citizen science project under this  
16 section shall agree—

17 (A) to assume any and all risks associated  
18 with such participation; and

19 (B) to waive all claims against the Federal  
20 Government and its related entities, except for  
21 claims based on willful misconduct, for any in-  
22 jury, death, damage, or loss of property, rev-  
23 enue, or profits (whether direct, indirect, or  
24 consequential) arising from participation in the  
25 project.

1           (9) RESEARCH MISCONDUCT.—Federal science  
2 agencies coordinating crowdsourcing or citizen  
3 science projects under this section shall make all  
4 practicable efforts to ensure that participants adhere  
5 to all relevant Federal research misconduct policies  
6 and other applicable ethics policies.

7           (10) MULTI-SECTOR PARTNERSHIPS.—The  
8 head of each Federal science agency engaged in  
9 crowdsourcing or citizen science under this section,  
10 or the heads of multiple Federal science agencies  
11 working cooperatively, may enter into a contract or  
12 other agreement to share administrative duties for  
13 such projects with—

14                   (A) a for-profit or nonprofit private sector  
15 entity, including a private institution of higher  
16 education;

17                   (B) a State, tribal, local, or foreign govern-  
18 ment agency, including a public institution of  
19 higher education; or

20                   (C) a public-private partnership.

21           (11) FUNDING.—In carrying out crowdsourcing  
22 and citizen science projects under this section, the  
23 head of a Federal science agency, or the heads of  
24 multiple Federal science agencies working coopera-  
25 tively—

1 (A) may use funds appropriated by Con-  
2 gress;

3 (B) may publicize projects and solicit and  
4 accept funds or in-kind support for such  
5 projects, to be available to the extent provided  
6 by appropriations Acts, from—

7 (i) other Federal agencies;

8 (ii) for-profit or nonprofit private sec-  
9 tor entities, including private institutions  
10 of higher education; or

11 (iii) State, tribal, local, or foreign gov-  
12 ernment agencies, including public institu-  
13 tions of higher education; and

14 (C) may not give any special consideration  
15 to any entity described in subparagraph (B) in  
16 return for such funds or in-kind support.

17 (12) FACILITATION.—

18 (A) GENERAL SERVICES ADMINISTRATION  
19 ASSISTANCE.—The Administrator of the Gen-  
20 eral Services Administration, in coordination  
21 with the Director of the Office of Personnel  
22 Management and the Director of the Office of  
23 Science and Technology Policy, shall, at no cost  
24 to Federal science agencies, identify and de-  
25 velop relevant products, training, and services

1 to facilitate the use of crowdsourcing and cit-  
2 izen science projects under this section, includ-  
3 ing by specifying the appropriate contract vehi-  
4 cles and technology and organizational plat-  
5 forms to enhance the ability of Federal science  
6 agencies to carry out the projects under this  
7 section.

8 (B) ADDITIONAL GUIDANCE.—The head of  
9 each Federal science agency engaged in  
10 crowdsourcing or citizen science under this sec-  
11 tion may—

12 (i) consult any guidance provided by  
13 the Director of the Office of Science and  
14 Technology Policy, including the Federal  
15 Crowdsourcing and Citizen Science Tool-  
16 kit;

17 (ii) designate a coordinator for that  
18 Federal science agency’s crowdsourcing  
19 and citizen science projects; and

20 (iii) share best practices with other  
21 Federal agencies, including participation of  
22 staff in the Federal Community of Practice  
23 for Crowdsourcing and Citizen Science.

24 (e) REPORT.—

1           (1) IN GENERAL.—Not later than 2 years after  
2 the date of the enactment of this Act, the Director  
3 of the Office of Science and Technology Policy shall  
4 include, as a component of an annual report re-  
5 quired under section 24(p) of the Stevenson-Wydler  
6 Technology Innovation Act of 1980 (15 U.S.C.  
7 3719(p)), a report on the projects and activities car-  
8 ried out under this section.

9           (2) INFORMATION INCLUDED.—The report re-  
10 quired under paragraph (1) shall include—

11           (A) a summary of each crowdsourcing and  
12 citizen science project conducted by a Federal  
13 science agency during the most recently com-  
14 pleted 2 fiscal years, including a description of  
15 the proposed goals of each crowdsourcing and  
16 citizen science project;

17           (B) an analysis of why the utilization of a  
18 crowdsourcing or citizen science project summa-  
19 rized in subparagraph (A) was the preferable  
20 method of achieving the goals described in sub-  
21 paragraph (A) as opposed to other authorities  
22 available to the Federal science agency, such as  
23 contracts, grants, cooperative agreements, and  
24 prize competitions;



1 (C) the participation rates, submission lev-  
2 els, number of consents, and any other statistic  
3 that might be considered relevant in each  
4 crowdsourcing and citizen science project;

5 (D) a detailed description of—

6 (i) the resources, including personnel  
7 and funding, that were used in the execu-  
8 tion of each crowdsourcing and citizen  
9 science project;

10 (ii) the project activities for which  
11 such resources were used; and

12 (iii) how the obligations and expendi-  
13 tures relating to the project's execution  
14 were allocated among the accounts of the  
15 Federal science agency, including a de-  
16 scription of the amount and source of all  
17 funds, private, public, and in-kind, contrib-  
18 uted to each crowdsourcing and citizen  
19 science project;

20 (E) a summary of the use of  
21 crowdsourcing and citizen science by all Federal  
22 science agencies, including interagency and  
23 multi-sector partnerships;

24 (F) a description of how each  
25 crowdsourcing and citizen science project ad-

1 vanced the mission of each participating Fed-  
2 eral science agency;

3 (G) an identification of each crowdsourcing  
4 or citizen science project where data collected  
5 through such project was not made available to  
6 the public, including the reasons for such ac-  
7 tion; and

8 (H) any other information that the Direc-  
9 tor of the Office of Science and Technology Pol-  
10 icy considers relevant.

11 (f) SAVINGS PROVISION.—Nothing in this section  
12 may be construed—

13 (1) to affect the authority to conduct  
14 crowdsourcing and citizen science authorized by any  
15 other provision of law; or

16 (2) to displace Federal Government resources  
17 allocated to the Federal science agencies that use  
18 crowdsourcing or citizen science authorized under  
19 this section to carry out a project.

20 **SEC. 403. NIST DIRECTOR FUNCTIONS UPDATE.**

21 Section 2(b) of the National Institute of Standards  
22 and Technology Act (15 U.S.C. 272(b)), as amended by  
23 section 403 of this Act, is further amended—

24 (1) in the matter preceding paragraph (1), by  
25 striking “authorized to take” and inserting “author-



1 (B) in the third sentence, by striking “Na-  
 2 tional Bureau of Standards” and inserting  
 3 “National Institute of Standards and Tech-  
 4 nology”; and  
 5 (2) in subsection (h)(1), by striking “, including  
 6 the Program established under section 28,”.

## 7 **TITLE V—MANUFACTURING**

### 8 **SEC. 501. HOLLINGS MANUFACTURING EXTENSION PART-** 9 **nership Improvements.**

10 (a) **SHORT TITLE.**—This section may be cited as the  
 11 “Manufacturing Extension Partnership Improvement  
 12 Act”.

13 (b) **IN GENERAL.**—Section 25 of the National Insti-  
 14 tute of Standards and Technology Act (15 U.S.C. 278k)  
 15 is amended to read as follows:

### 16 **“SEC. 25. HOLLINGS MANUFACTURING EXTENSION PART-** 17 **nership.**

18 “(a) **DEFINITIONS.**—In this section:

19 “(1) **APPROPRIATE COMMITTEES OF CON-**  
 20 **GRESS.**—The term ‘appropriate committees of Con-  
 21 gress’ means—

22 “(A) the Committee on Commerce,  
 23 Science, and Transportation of the Senate; and

1           “(B) the Committee on Science, Space,  
2           and Technology of the House of Representa-  
3           tives.

4           “(2) AREA CAREER AND TECHNICAL EDU-  
5           CATION SCHOOL.—The term ‘area career and tech-  
6           nical education school’ has the meaning given the  
7           term in section 3 of the Vocational Education Act of  
8           1963 (20 U.S.C. 2302).

9           “(3) CENTER.—The term ‘Center’ means a  
10          manufacturing extension center that—

11                 “(A) is created under subsection (b); and

12                 “(B) is affiliated with an eligible entity  
13                 that applies for and is awarded financial sup-  
14                 port under subsection (e).

15           “(4) COMMUNITY COLLEGE.—The term ‘com-  
16           munity college’ means an institution of higher edu-  
17           cation (as defined under section 101(a) of the High-  
18           er Education Act of 1965 (20 U.S.C. 1001(a))) at  
19           which the highest degree that is predominately  
20           awarded to students is an associate’s degree.

21           “(5) ELIGIBLE ENTITY.—The term ‘eligible en-  
22           tity’ means a United States-based nonprofit institu-  
23           tion, or consortium thereof, an institution of higher  
24           education, or a State, United States territory, local,  
25           or tribal government.

1           “(6) HOLLINGS MANUFACTURING EXTENSION  
2 PARTNERSHIP OR PROGRAM.—The term ‘Hollings  
3 Manufacturing Extension Partnership’ or ‘Program’  
4 means the program established under subsection (b).

5           “(7) MEP ADVISORY BOARD.—The term ‘MEP  
6 Advisory Board’ means the Manufacturing Exten-  
7 sion Partnership Advisory Board established under  
8 subsection (n).

9           “(b) ESTABLISHMENT AND PURPOSE.—The Sec-  
10 retary, acting through the Director and, if appropriate,  
11 through other Federal officials, shall establish a program  
12 to provide assistance for the creation and support of man-  
13 ufacturing extension centers for the transfer of manufac-  
14 turing technology and best business practices.

15           “(c) OBJECTIVE.—The objective of the Program shall  
16 be to enhance competitiveness, productivity, and techno-  
17 logical performance in United States manufacturing  
18 through—

19           “(1) the transfer of manufacturing technology  
20 and techniques developed at the Institute to Centers  
21 and, through them, to manufacturing companies  
22 throughout the United States;

23           “(2) the participation of individuals from indus-  
24 try, institutions of higher education, State govern-  
25 ments, other Federal agencies, and, when appro-

1       appropriate, the Institute in cooperative technology trans-  
2       fer activities;

3               “(3) efforts to make new manufacturing tech-  
4       nology and processes usable by United States-based  
5       small and medium-sized companies;

6               “(4) the active dissemination of scientific, engi-  
7       neering, technical, and management information  
8       about manufacturing to industrial firms, including  
9       small and medium-sized manufacturing companies;

10              “(5) the utilization, when appropriate, of the  
11       expertise and capability that exists in Federal agen-  
12       cies, other than the Institute, and federally spon-  
13       sored laboratories;

14              “(6) the provision to community colleges and  
15       area career and technical education schools of infor-  
16       mation about the job skills needed in manufacturing  
17       companies, including small and medium-sized manu-  
18       facturing businesses in the regions they serve;

19              “(7) the promotion and expansion of certifi-  
20       cation systems offered through industry, associa-  
21       tions, and local colleges when appropriate, including  
22       efforts such as facilitating training, supporting new  
23       or existing apprenticeships, and providing access to  
24       information and experts, to address workforce needs

1 and skills gaps in order to assist small and medium-  
2 sized manufacturing businesses; and

3 “(8) the growth in employment and wages at  
4 United States-based small and medium-sized compa-  
5 nies.

6 “(d) ACTIVITIES.—The activities of a Center shall in-  
7 clude—

8 “(1) the establishment of automated manufac-  
9 turing systems and other advanced production tech-  
10 nologies, based on Institute-supported research, for  
11 the purpose of demonstrations and technology trans-  
12 fer;

13 “(2) the active transfer and dissemination of re-  
14 search findings and Center expertise to a wide range  
15 of companies and enterprises, particularly small and  
16 medium-sized manufacturers; and

17 “(3) the facilitation of collaborations and part-  
18 nerships between small and medium-sized manufac-  
19 turing companies, community colleges, and area ca-  
20 reer and technical education schools, to help those  
21 entities better understand the specific needs of man-  
22 ufacturers and to help manufacturers better under-  
23 stand the skill sets that students learn in the pro-  
24 grams offered by such colleges and schools.

25 “(e) FINANCIAL ASSISTANCE.—



1           “(1) AUTHORIZATION.—Except as provided in  
2 paragraph (2), the Secretary may provide financial  
3 assistance for the creation and support of a Center  
4 through a cooperative agreement with an eligible en-  
5 tity.

6           “(2) COST SHARING.—The Secretary may not  
7 provide more than 50 percent of the capital and an-  
8 nual operating and maintenance funds required to  
9 establish and support a Center.

10           “(3) RULE OF CONSTRUCTION.—For purposes  
11 of paragraph (2), any amount received by an eligible  
12 entity for a Center under a provision of law other  
13 than paragraph (1) shall not be considered an  
14 amount provided under paragraph (1).

15           “(4) REGULATIONS.—The Secretary may revise  
16 or promulgate such regulations as necessary to carry  
17 out this subsection.

18           “(f) APPLICATIONS.—

19           “(1) IN GENERAL.—An eligible entity shall sub-  
20 mit an application to the Secretary at such time, in  
21 such manner, and containing such information as  
22 the Secretary may require.

23           “(2) PROGRAM DESCRIPTION.—The Secretary  
24 shall establish and update, as necessary—

25           “(A) a description of the Program;

1 “(B) the application procedures;

2 “(C) performance metrics;

3 “(D) criteria for determining qualified ap-  
4 plicants;

5 “(E) criteria for choosing recipients of fi-  
6 nancial assistance from among the qualified ap-  
7 plicants;

8 “(F) procedures for determining allowable  
9 cost share contributions; and

10 “(G) such other program policy objectives  
11 and operational procedures as the Secretary  
12 considers necessary.

13 “(3) COST SHARING.—

14 “(A) IN GENERAL.—To be considered for  
15 financial assistance under this section, an appli-  
16 cant shall provide adequate assurances that the  
17 applicant and if applicable, the applicant’s  
18 partnering organizations, will obtain funding  
19 for not less than 50 percent of the capital and  
20 annual operating and maintenance funds re-  
21 quired to establish and support the Center from  
22 sources other than the financial assistance pro-  
23 vided under subsection (e).

24 “(B) AGREEMENTS WITH OTHER ENTI-  
25 TIES.—In meeting the cost-sharing requirement

1 under subparagraph (A), an eligible entity may  
2 enter into an agreement with one or more other  
3 entities, such as a private industry, institutions  
4 of higher education, or a State, United States  
5 territory, local, or tribal government for the  
6 contribution by that other entity of funding if  
7 the Secretary determines the agreement—

8 “(i) is programmatically reasonable;

9 “(ii) will help accomplish pro-  
10 grammatic objectives; and

11 “(iii) is allocable under Program pro-  
12 cedures under subsection (f)(2).

13 “(4) LEGAL RIGHTS.—Each applicant shall in-  
14 clude in the application a proposal for the allocation  
15 of the legal rights associated with any intellectual  
16 property which may result from the activities of the  
17 Center.

18 “(5) MERIT REVIEW OF APPLICATIONS.—

19 “(A) IN GENERAL.—The Secretary shall  
20 subject each application to merit review.

21 “(B) CONSIDERATIONS.—In making a de-  
22 cision whether to approve an application and  
23 provide financial assistance under subsection  
24 (e), the Secretary shall consider, at a min-  
25 imum—

1                   “(i) the merits of the application, par-  
2                   ticularly those portions of the application  
3                   regarding technology transfer, training and  
4                   education, and adaptation of manufac-  
5                   turing technologies to the needs of par-  
6                   ticular industrial sectors;

7                   “(ii) the quality of service to be pro-  
8                   vided;

9                   “(iii) the geographical diversity and  
10                  extent of the service area; and

11                  “(iv) the type and percentage of fund-  
12                  ing and in-kind commitment from other  
13                  sources under paragraph (3).

14                  “(g) EVALUATIONS.—

15                         “(1) THIRD AND EIGHTH YEAR EVALUATIONS  
16                         BY PANEL.—

17                                 “(A) IN GENERAL.—The Secretary shall  
18                                 ensure that each Center is evaluated during its  
19                                 third and eighth years of operation by an eval-  
20                                 uation panel appointed by the Secretary.

21                                 “(B) COMPOSITION.—The Secretary shall  
22                                 ensure that each evaluation panel appointed  
23                                 under subparagraph (A) is composed of—

1                   “(i) private experts, none of whom are  
2                   connected with the Center evaluated by the  
3                   panel; and

4                   “(ii) Federal officials.

5                   “(C) CHAIRPERSON.—For each evaluation  
6                   panel appointed under subparagraph (B), the  
7                   Secretary shall appoint a chairperson who is an  
8                   official of the Institute.

9                   “(2) FIFTH YEAR EVALUATIONS BY SEC-  
10                  RETARY.—In the fifth year of operation of a Center,  
11                  the Secretary shall conduct a review of the Center.

12                  “(3) PERFORMANCE MEASUREMENT.—In evalu-  
13                  ating a Center an evaluation panel or the Secretary,  
14                  as applicable, shall measure the performance of the  
15                  Center against—

16                         “(A) the objective specified in subsection  
17                         (e);

18                         “(B) the performance metrics under sub-  
19                         section (f)(2)(C); and

20                         “(C) such other criterion as considered ap-  
21                         propriate by the Secretary.

22                         “(4) POSITIVE EVALUATIONS.—If an evaluation  
23                         of a Center is positive, the Secretary may continue  
24                         to provide financial assistance for the Center—

1           “(A) in the case of an evaluation occurring  
2 in the third year of a Center, through the fifth  
3 year of the Center;

4           “(B) in the case of an evaluation occurring  
5 in the fifth year of a Center, through the eighth  
6 year of the Center; and

7           “(C) in the case of an evaluation occurring  
8 in the eighth year of a Center, through the  
9 tenth year of the Center.

10       “(5) OTHER THAN POSITIVE EVALUATIONS.—

11           “(A) PROBATION.—If an evaluation of a  
12 Center is other than positive, the Secretary  
13 shall put the Center on probation during the  
14 period beginning on the date that the Center  
15 receives notice under subparagraph (B)(i) and  
16 ending on the date that the reevaluation is com-  
17 plete under subparagraph (B)(iii).

18           “(B) NOTICE AND REEVALUATION.—If a  
19 Center receives an evaluation that is other than  
20 positive, the evaluation panel or Secretary, as  
21 applicable, shall—

22           “(i) notify the Center of the reason,  
23 including any deficiencies in the perform-  
24 ance of the Center identified during the  
25 evaluation;

1           “(ii) assist the Center in remedying  
2           the deficiencies by providing the Center,  
3           not less frequently than once every 3  
4           months, an analysis of the Center, if con-  
5           sidered appropriate by the panel or Sec-  
6           retary, as applicable; and

7           “(iii) reevaluate the Center not later  
8           than 1 year after the date of the notice  
9           under clause (i).

10           “(C) CONTINUED SUPPORT DURING PE-  
11           RIOD OF PROBATION.—

12           “(i) IN GENERAL.—The Secretary  
13           may continue to provide financial assist-  
14           ance under subsection (e) for a Center  
15           during the probation period.

16           “(ii) POST PROBATION.—After the pe-  
17           riod of probation, the Secretary shall not  
18           provide any financial assistance unless the  
19           Center has received a positive evaluation  
20           under subparagraph (B)(iii).

21           “(6) FAILURE TO REMEDY.—

22           “(A) IN GENERAL.—If a Center fails to  
23           remedy a deficiency or to show significant im-  
24           provement in performance before the end of the  
25           probation period under paragraph (5), the Sec-

1           retary shall conduct a competition to select an  
2           operator for the Center under subsection (h).

3                   “(B) TREATMENT OF CENTERS SUBJECT  
4           TO NEW COMPETITION.—Upon the selection of  
5           an operator for a Center under subsection (h),  
6           the Center shall be considered a new Center  
7           and the calculation of the years of operation of  
8           that Center for purposes of paragraphs (1)  
9           through (5) of this subsection and subsection  
10          (h)(1) shall start anew.

11          “(h) REAPPLICATION COMPETITION FOR FINANCIAL  
12   ASSISTANCE AFTER 10 YEARS.—

13                   “(1) IN GENERAL.—If an eligible entity has op-  
14          erated a Center under this section for a period of 10  
15          consecutive years, the Secretary shall conduct a com-  
16          petition to select an eligible entity to operate the  
17          Center in accordance with the process plan under  
18          subsection (i).

19                   “(2) INCUMBENT ELIGIBLE ENTITIES.—An eli-  
20          gible entity that has received financial assistance  
21          under this section for a period of 10 consecutive  
22          years and that the Secretary determines is in good  
23          standing shall be eligible to compete in the competi-  
24          tion under paragraph (1).



1           “(3) TREATMENT OF CENTERS SUBJECT TO RE-  
2           APPLICATION COMPETITION.—Upon the selection of  
3           an operator for a Center under paragraph (1), the  
4           Center shall be considered a new Center and the cal-  
5           culation of the years of operation of that Center for  
6           purposes of paragraphs (1) through (5) of sub-  
7           section (g) shall start anew.

8           “(i) PROCESS PLAN.—Not later than 180 days after  
9           the date of the enactment of the American Innovation and  
10          Competitiveness Act, the Secretary shall implement and  
11          submit to Congress a plan for how the Institute will con-  
12          duct an evaluation, competition, and reapplication com-  
13          petition under this section.

14          “(j) OPERATIONAL REQUIREMENTS.—

15                 “(1) PROTECTION OF CONFIDENTIAL INFORMA-  
16                 TION OF CENTER CLIENTS.—The following informa-  
17                 tion, if obtained by the Federal Government in con-  
18                 nection with an activity of a Center or the Program,  
19                 shall be exempt from public disclosure under section  
20                 552 of title 5, United States Code:

21                         “(A) Information on the business operation  
22                         of any participant in the Program or of a client  
23                         of a Center.

24                         “(B) Trade secrets of any client of a Cen-  
25                         ter.

1 “(k) OVERSIGHT BOARDS.—

2 “(1) IN GENERAL.—As a condition on receipt of  
3 financial assistance for a Center under subsection  
4 (e), an eligible entity shall establish a board to over-  
5 see the operations of the Center.

6 “(2) STANDARDS.—

7 “(A) IN GENERAL.—The Director shall es-  
8 tablish appropriate standards for each board  
9 described under paragraph (1).

10 “(B) CONSIDERATIONS.—In establishing  
11 the standards, the Director shall take into ac-  
12 count the type and organizational structure of  
13 an eligible entity.

14 “(C) REQUIREMENTS.—The standards  
15 shall address—

16 “(i) membership;

17 “(ii) composition;

18 “(iii) term limits;

19 “(iv) conflicts of interest; and

20 “(v) such other requirements as the  
21 Director considers necessary.

22 “(3) MEMBERSHIP.—

23 “(A) IN GENERAL.—Each board estab-  
24 lished under paragraph (1) shall be composed  
25 of members as follows:

1           “(i) The membership of each board  
2           shall be representative of stakeholders in  
3           the region in which the Center is located.

4           “(ii) A majority of the members of the  
5           board shall be selected from among indi-  
6           viduals who own or are employed by small  
7           or medium-sized manufacturers.

8           “(B) LIMITATION.—A member of a board  
9           established under paragraph (1) may not serve  
10          on more than 1 board established under that  
11          paragraph.

12          “(4) BYLAWS.—

13                 “(A) IN GENERAL.—Each board estab-  
14                 lished under paragraph (1) shall adopt and sub-  
15                 mit to the Director bylaws to govern the oper-  
16                 ation of the board.

17                 “(B) CONFLICTS OF INTEREST.—Bylaws  
18                 adopted under subparagraph (A) shall include  
19                 policies to minimize conflicts of interest, includ-  
20                 ing such policies relating to disclosure of rela-  
21                 tionships and recusal as may be necessary to  
22                 minimize conflicts of interest.

23          “(1) ACCEPTANCE OF FUNDS.—In addition to such  
24          sums as may be appropriated to the Secretary and Direc-  
25          tor to operate the Program, the Secretary and Director

1 may also accept funds from other Federal departments  
2 and agencies and from the private sector under section  
3 2(c)(7) of this Act (15 U.S.C. 272(c)(7)), to be available  
4 to the extent provided by appropriations Acts, for the pur-  
5 pose of strengthening United States manufacturing.

6 “(m) MEP ADVISORY BOARD.—

7 “(1) ESTABLISHMENT.—There is established  
8 within the Institute a Manufacturing Extension  
9 Partnership Advisory Board.

10 “(2) MEMBERSHIP.—

11 “(A) COMPOSITION.—

12 “(i) IN GENERAL.—The MEP Advi-  
13 sory Board shall consist of not fewer than  
14 10 members appointed by the Director and  
15 broadly representative of stakeholders.

16 “(ii) REQUIREMENTS.—Of the mem-  
17 bers appointed under clause (i)—

18 “(I) at least 2 members shall be  
19 employed by or on an advisory board  
20 for a Center;

21 “(II) at least 5 members shall be  
22 from United States small businesses  
23 in the manufacturing sector; and

24 “(III) at least 1 member shall  
25 represent a community college.

1                   “(iii) LIMITATION.—No member of  
2                   the MEP Advisory Board shall be an em-  
3                   ployee of the Federal Government.

4                   “(B) TERM.—Except as provided in sub-  
5                   paragraph (C), the term of office of each mem-  
6                   ber of the MEP Advisory Board shall be 3  
7                   years.

8                   “(C) VACANCIES.—Any member appointed  
9                   to fill a vacancy occurring prior to the expira-  
10                  tion of the term for which his predecessor was  
11                  appointed shall be appointed for the remainder  
12                  of such term.

13                  “(D) SERVING CONSECUTIVE TERMS.—  
14                  Any person who has completed 2 consecutive  
15                  full terms of service on the MEP Advisory  
16                  Board shall thereafter be ineligible for appoint-  
17                  ment during the 1-year period following the ex-  
18                  piration of the second such term.

19                  “(3) MEETINGS.—The MEP Advisory Board  
20                  shall—

21                         “(A) meet not less than biannually; and

22                         “(B) provide to the Director—

23                                 “(i) advice on the activities, plans,  
24                                 and policies of the Program;

1                   “(ii) assessments of the soundness of  
2                   the plans and strategies of the Program;  
3                   and

4                   “(iii) assessments of current perform-  
5                   ance against the plans of the Program.

6                   “(4) FACA APPLICABILITY.—

7                   “(A) IN GENERAL.—In discharging its du-  
8                   ties under this subsection, the MEP Advisory  
9                   Board shall function solely in an advisory ca-  
10                  pacity, in accordance with the Federal Advisory  
11                  Committee Act (5 U.S.C. App.).

12                  “(B) EXCEPTION.—Section 14 of the Fed-  
13                  eral Advisory Committee Act shall not apply to  
14                  the MEP Advisory Board.

15                  “(5) ANNUAL REPORT.—

16                  “(A) IN GENERAL.—At a minimum, the  
17                  MEP Advisory Board shall transmit an annual  
18                  report to the Secretary for transmittal to Con-  
19                  gress not later than 30 days after the submis-  
20                  sion to Congress of the President’s annual  
21                  budget under section 1105 of title 31, United  
22                  States Code.

23                  “(B) CONTENTS.—The report shall ad-  
24                  dress the status of the Program and describe  
25                  the relevant sections of the programmatic plan-

1           ning document and updates thereto transmitted  
2           to Congress by the Director under subsections  
3           (c) and (d) of section 23 (15 U.S.C. 278i).

4           “(n) SMALL MANUFACTURERS.—

5           “(1) EVALUATION OF OBSTACLES.—As part of  
6           the Program, the Director shall—

7           “(A) identify obstacles that prevent small  
8           manufacturers from effectively competing in the  
9           global market;

10           “(B) implement a comprehensive plan to  
11           train the Centers to address the obstacles iden-  
12           tified in paragraph (2); and

13           “(C) facilitate improved communication be-  
14           tween the Centers to assist such manufacturers  
15           in implementing appropriate, targeted solutions  
16           to the obstacles identified in paragraph (2).

17           “(2) DEVELOPMENT OF OPEN ACCESS RE-  
18           SOURCES.—As part of the Program, the Secretary  
19           shall develop open access resources that address best  
20           practices related to inventory sourcing, supply chain  
21           management, manufacturing techniques, available  
22           Federal resources, and other topics to further the  
23           competitiveness and profitability of small manufac-  
24           turers.”.

1           (c) COMPETITIVE AWARDS PROGRAM.—The National  
2 Institute of Standards and Technology Act (15 U.S.C. 271  
3 et seq.) is amended by inserting after section 25 the fol-  
4 lowing:

5 **“SEC. 25A. COMPETITIVE AWARDS PROGRAM.**

6           “(a) ESTABLISHMENT.—The Director shall establish  
7 within the Hollings Manufacturing Extension Partnership  
8 under section 25 (15 U.S.C. 278k) and section 26 (15  
9 U.S.C. 278l) a program of competitive awards among par-  
10 ticipants described in subsection (b) of this section for the  
11 purposes described in subsection (c).

12           “(b) PARTICIPANTS.—Participants receiving awards  
13 under this section shall be Centers, or a consortium of  
14 Centers.

15           “(c) PURPOSE, THEMES, AND REIMBURSEMENT.—

16               “(1) PURPOSE.—The purpose of the program  
17 established under subsection (a) is to add capabili-  
18 ties to the Hollings Manufacturing Extension Part-  
19 nership, including the development of projects to  
20 solve new or emerging manufacturing problems as  
21 determined by the Director, in consultation with the  
22 Director of the Hollings Manufacturing Extension  
23 Partnership, the MEP Advisory Board, other Fed-  
24 eral agencies, and small and medium-sized manufac-  
25 turers.



1           “(2) THEMES.—The Director may identify one  
2           or more themes for a competition carried out under  
3           this section, which may vary from year to year, as  
4           the Director considers appropriate after assessing  
5           the needs of manufacturers and the success of pre-  
6           vious competitions.

7           “(3) REIMBURSEMENT.—Centers may be reim-  
8           bursed for costs incurred by the Centers under this  
9           section.

10          “(d) APPLICATIONS.—Applications for awards under  
11          this section shall be submitted in such manner, at such  
12          time, and containing such information as the Director  
13          shall require in consultation with the MEP Advisory  
14          Board.

15          “(e) SELECTION.—

16                 “(1) PEER REVIEW AND COMPETITIVELY  
17                 AWARDED.—The Director shall ensure that awards  
18                 under this section are peer reviewed and competi-  
19                 tively awarded.

20                 “(2) GEOGRAPHIC DIVERSITY.—The Director  
21                 shall endeavor to have broad geographic diversity  
22                 among selected proposals.

23                 “(3) CRITERIA.—The Director shall select ap-  
24                 plications to receive awards that the Director deter-  
25                 mines will achieve one or more of the following:

1           “(A) Improve the competitiveness of indus-  
2           tries in the region in which the Center or Cen-  
3           ters are located.

4           “(B) Create jobs or train newly hired em-  
5           ployees.

6           “(C) Promote the transfer and commer-  
7           cialization of research and technology from in-  
8           stitutions of higher education, national labora-  
9           tories or other federally funded research pro-  
10          grams, and nonprofit research institutes.

11          “(D) Recruit a diverse manufacturing  
12          workforce, including through outreach to under-  
13          represented populations, including individuals  
14          identified in section 33 or section 34 of the  
15          Science and Engineering Equal Opportunities  
16          Act (42 U.S.C. 1885a, 1885b).

17          “(E) Such other result as the Director de-  
18          termines will advance the objective set forth in  
19          section 25(c) (15 U.S.C. 278k) or in section 26  
20          (15 U.S.C. 278l).

21          “(f) PROGRAM CONTRIBUTION.—Recipients of  
22          awards under this section shall not be required to provide  
23          a matching contribution.

24          “(g) GLOBAL MARKETPLACE PROJECTS.—In making  
25          an award under this section, the Director, in consultation

1 with the MEP Advisory Board and the Secretary, may  
2 take into consideration whether an application has signifi-  
3 cant potential for enhancing the competitiveness of small  
4 and medium-sized United States manufacturers in the  
5 global marketplace.

6 “(h) DURATION.—The duration of an award under  
7 this section shall be for not more than 3 years.

8 “(i) DEFINITIONS.—The terms used in this section  
9 have the meanings given the terms in section 25 (15  
10 U.S.C. 278k).”.

11 (d) REPORTS.—

12 (1) IN GENERAL.—Not later than 2 years after  
13 the date of enactment of this Act, the Comptroller  
14 General of the United States, in consultation with  
15 the MEP Advisory Board (as defined in section 25  
16 of the National Institute of Standards and Tech-  
17 nology Act (15 U.S.C. 278k)), shall submit to the  
18 appropriate committees of Congress a report ana-  
19 lyzing—

20 (A) the effectiveness of the changes in the  
21 cost share to Centers under section 25 of the  
22 National Institute of Standards and Technology  
23 Act (15 U.S.C. 278k);

24 (B) the engagement in services and the  
25 characteristics of services provided by 2 types of

1 Centers, including volume and type of service;  
2 and

3 (C) whether the cost-sharing ratio has any  
4 effect on the services provided by either type of  
5 Center.

6 (2) INDEPENDENT ASSESSMENT.—

7 (A) IN GENERAL.—Not later than 3 years  
8 after the date of submission of the report under  
9 paragraph (1), the Director of NIST shall con-  
10 tract with an independent organization to per-  
11 form an assessment of the implementation of  
12 the reapplication competition process.

13 (B) CONSULTATION.—The independent or-  
14 ganization performing the assessment under  
15 subparagraph (A) may consult with the MEP  
16 Advisory Board (as defined in section 25 of the  
17 National Institute of Standards and Technology  
18 Act (15 U.S.C. 278k)).

19 (3) COMPARISON OF CENTERS.—

20 (A) IN GENERAL.—Not later than 2 years  
21 after the date of enactment of this Act, the Di-  
22 rector shall submit to the appropriate commit-  
23 tees of Congress a report providing information  
24 on the first and second years of operations for  
25 Centers (as defined in section 25 of the Na-

1            tional Institute of Standards and Technology  
2            Act (15 U.S.C. 278k)) operating from new com-  
3            petitions or recompetition as compared to long-  
4            standing Centers.

5            (B) CONTENTS.—The report shall provide  
6            detail on the engagement in services provided  
7            by Centers and the characteristics of services  
8            provided, including volume and type of services,  
9            so that the appropriate committees of Congress  
10           can evaluate whether the cost-sharing ratio has  
11           an effect on the services provided at Centers.

12           (e) CONFORMING AMENDMENTS.—

13           (1) DEFINITIONS.—Section 2199(3) of title 10,  
14           United States Code, is amended—

15           (A) by striking “regional center” and in-  
16           serting “manufacturing extension center”;

17           (B) by inserting “and best business prac-  
18           tices” before “referred”; and

19           (C) by striking “25(a)” and inserting  
20           “25(b)”.

21           (2) ENTERPRISE INTEGRATION INITIATIVE.—  
22           Section 3(a) of the Enterprise Integration Act of  
23           2002 (15 U.S.C. 278g–5(a)) is amended by inserting  
24           “Hollings” before “Manufacturing Extension Part-  
25           nership”.

1           (3) ASSISTANCE TO STATE TECHNOLOGY PRO-  
2           GRAMS.—Section 26(a) of the National Institute of  
3           Standards and Technology Act (15 U.S.C. 278l(a))  
4           is amended by striking “Centers program created”  
5           and inserting “Hollings Manufacturing Extension  
6           Partnership”.

7           (f) SAVINGS PROVISIONS.—Notwithstanding the  
8           amendments made by subsections (a) and (b) of this sec-  
9           tion, the Secretary of Commerce may carry out section  
10          25 of the National Institute of Standards and Technology  
11          Act (15 U.S.C. 278k) as that section was in effect on the  
12          day before the date of enactment of this Act, with respect  
13          to existing grants, agreements, cooperative agreements, or  
14          contracts, and with respect to applications for such items  
15          that are received by the Secretary prior to the date of en-  
16          actment of this Act.

17          (g) PATENT RIGHTS.—The provisions of chapter 18  
18          of title 35, United States Code, shall apply, to the extent  
19          not inconsistent with section 25 of the National Institute  
20          of Standards and Technology Act (15 U.S.C. 278k) and  
21          section 25 of that Act, to the promotion of technology  
22          from research by Centers under those sections, except for  
23          contracts for such specific technology extension or transfer  
24          services as may be specified by the Director of NIST or  
25          under other law.

1       **TITLE VI—INNOVATION AND**  
2       **TECHNOLOGY TRANSFER**

3       **SEC. 601. INNOVATION CORPS.**

4       (a) FINDINGS.—Congress makes the following find-  
5       ings:

6               (1) The National Science Foundation Innova-  
7       tion Corps (referred to in this section as the “I-  
8       Corps”) was established to foster a national innova-  
9       tion ecosystem by encouraging institutions, sci-  
10      entists, engineers, and entrepreneurs to identify and  
11      explore the innovation and commercial potential of  
12      National Science Foundation-funded research well  
13      beyond the laboratory.

14              (2) Through I-Corps, the Foundation invests in  
15      entrepreneurship and commercialization education,  
16      training, and mentoring that can ultimately lead to  
17      the practical deployment of technologies, products,  
18      processes, and services that improve the Nation’s  
19      competitiveness, promote economic growth, and ben-  
20      efit society.

21              (3) By building networks of entrepreneurs, edu-  
22      cators, mentors, institutions, and collaborations, and  
23      supporting specialized education and training, I-  
24      Corps is at the leading edge of a strong, lasting  
25      foundation for an American innovation ecosystem.

1           (4) By translating federally funded research to  
2           a commercial stage more quickly and efficiently, pro-  
3           grams like the I-Corps create new jobs and compa-  
4           nies, help solve societal problems, and provide tax-  
5           payers with a greater return on their investment in  
6           research.

7           (5) The I-Corps program model has a strong  
8           record of success that should be replicated at all  
9           Federal science agencies.

10          (b) SENSE OF CONGRESS.—It is the sense of Con-  
11          gress that—

12           (1) commercialization of federally funded re-  
13           search can improve the Nation’s competitiveness,  
14           grow the economy, and benefit society;

15           (2) I-Corps is a useful tool in promoting the  
16           commercialization of federally funded research by  
17           training researchers funded by the Foundation in  
18           entrepreneurship and commercialization;

19           (3) I-Corps should continue to build a network  
20           of entrepreneurs, educators, mentors, and institu-  
21           tions and support specialized education and training;

22           (4) researchers other than those funded by the  
23           Foundation may also benefit from the education and  
24           training described in paragraph (3); and



1           (5) I-Corps should continue to promote a strong  
2 innovation system by investing in and supporting fe-  
3 male entrepreneurs through mentorship, education,  
4 and training because they are historically underrep-  
5 resented in entrepreneurial fields.

6           (c) I-CORPS PROGRAM.—

7           (1) IN GENERAL.—In order to promote a  
8 strong, lasting foundation for the national innova-  
9 tion ecosystem and increase the positive economic  
10 and social impact of federally funded research, the  
11 Director of the Foundation shall set forth eligibility  
12 requirements and carry out a program to award  
13 grants for entrepreneurship and commercialization  
14 education, training, and mentoring.

15           (2) EXPANSION OF I-CORPS.—

16           (A) IN GENERAL.—The Director—

17           (i) shall encourage the development  
18 and expansion of I-Corps and other train-  
19 ing programs that focus on professional  
20 development, including education in entre-  
21 preneurship and commercialization; and

22           (ii) may establish an agreement with  
23 another Federal science agency—

24           (I) to make researchers, stu-  
25 dents, and institutions funded by that

1 agency eligible to participate in the I-  
2 Corps program; or

3 (II) to assist that agency with  
4 the design and implementation of its  
5 own program that is similar to the I-  
6 Corps program.

7 (B) PARTNERSHIP FUNDING.—In negoti-  
8 ating an agreement with another Federal  
9 science agency under subparagraph (A)(ii), the  
10 Director shall require that Federal science  
11 agency to provide funding for—

12 (i) the training for researchers, stu-  
13 dents, and institutions selected for the I-  
14 Corps program; and

15 (ii) the locations that Federal science  
16 agency designates as regional and national  
17 infrastructure for science and engineering  
18 entrepreneurship.

19 (3) FOLLOW-ON GRANTS.—

20 (A) IN GENERAL.—Subject to subpara-  
21 graph (B), the Director, in consultation with  
22 the Director of the Small Business Innovation  
23 Research Program, shall make funds available  
24 for competitive grants, including to I-Corps par-  
25 ticipants, to help support—

1 (i) prototype or proof-of-concept devel-  
2 opment; and

3 (ii) such activities as the Director con-  
4 siders necessary to build local, regional,  
5 and national infrastructure for science and  
6 engineering entrepreneurship.

7 (B) LIMITATION.—Grants under subpara-  
8 graph (A) shall be limited to participants with  
9 innovations that because of the early stage of  
10 development are not eligible to participate in a  
11 Small Business Innovation Research Program  
12 or a Small Business Technology Transfer Pro-  
13 gram.

14 (4) STATE AND LOCAL PARTNERSHIPS.—The  
15 Director may engage in partnerships with State and  
16 local governments, economic development organiza-  
17 tions, and nonprofit organizations to provide access  
18 to the I-Corps program to support entrepreneurship  
19 education and training for researchers, students, and  
20 institutions under this subsection.

21 (5) REPORTS.—The Director shall submit to  
22 the appropriate committees of Congress a biennial  
23 report on I-Corps program efficacy, including  
24 metrics on the effectiveness of the program. Each  
25 Federal science agency participating in the I-Corps

1 program or that implements a similar program  
2 under paragraph (2)(A) shall contribute to the re-  
3 port.

4 (6) DEFINITIONS.—In this subsection, the  
5 terms “Small Business Innovation Research Pro-  
6 gram” and “Small Business Technology Transfer  
7 Program” have the meanings given those terms in  
8 section 9 of the Small Business Act (15 U.S.C.  
9 638).

10 **SEC. 602. TRANSLATIONAL RESEARCH GRANTS.**

11 (a) SENSE OF CONGRESS.—It is the sense of Con-  
12 gress that—

13 (1) commercialization of federally funded re-  
14 search may benefit society and the economy; and

15 (2) not-for-profit organizations support the  
16 commercialization of federally funded research by  
17 providing useful business and technical expertise to  
18 researchers.

19 (b) COMMERCIALIZATION PROMOTION.—The Direc-  
20 tor of the Foundation shall continue to award grants on  
21 a competitive, merit-reviewed basis to eligible entities to  
22 promote the commercialization of federally funded re-  
23 search results.

24 (c) USE OF FUNDS.—Activities supported by grants  
25 under this section may include—

1           (1) identifying Foundation-sponsored research  
2           and technologies that have the potential for acceler-  
3           ated commercialization;

4           (2) supporting prior or current Foundation-  
5           sponsored investigators, institutions of higher edu-  
6           cation, and nonprofit organizations that partner  
7           with an institution of higher education in under-  
8           taking proof-of-concept work, including development  
9           of prototypes of technologies that are derived from  
10          Foundation-sponsored research and have potential  
11          market value;

12          (3) promoting sustainable partnerships between  
13          Foundation-funded institutions, industry, and other  
14          organizations within academia and the private sector  
15          with the purpose of accelerating the transfer of tech-  
16          nology;

17          (4) developing multidisciplinary innovation eco-  
18          systems which involve and are responsive to specific  
19          needs of academia and industry; and

20          (5) providing professional development, men-  
21          toring, and advice in entrepreneurship, project man-  
22          agement, and technology and business development  
23          to innovators.

24          (d) ELIGIBILITY.—

1           (1) IN GENERAL.—The following organizations  
2 may be eligible for grants under this section:

3           (A) Institutions of higher education.

4           (B) Public or nonprofit technology transfer  
5 organizations.

6           (C) A nonprofit organization that partners  
7 with an institution of higher education.

8           (D) A consortia of two or more of the or-  
9 ganizations described under subparagraphs (A)  
10 through (C).

11          (2) LEAD ORGANIZATIONS.—Any eligible orga-  
12 nization under paragraph (1) may apply as a lead  
13 organization.

14          (e) APPLICATIONS.—An eligible entity seeking a  
15 grant under this section shall submit an application to the  
16 Director at such time, in such manner, and containing  
17 such information as the Director may require.

18 **SEC. 603. OPTICS AND PHOTONICS TECHNOLOGY INNOVA-**  
19 **TIONS.**

20          (a) FINDINGS.—Congress makes the following find-  
21 ings:

22           (1) The 1998 National Research Council Re-  
23 port, “Harnessing Light” presented a comprehensive  
24 overview on the importance of optics and photonics  
25 to various sectors of the United States economy.

1           (2) In 2012, in response to increased coordina-  
2           tion and investment by other nations, the National  
3           Research Council released a follow up study recom-  
4           mending a national photonics initiative to increase  
5           collaboration and coordination among United States  
6           industry, Federal and State government, and aca-  
7           demia to identify and further advance areas of  
8           photonics critical to regaining United States com-  
9           petitiveness and maintaining national security.

10           (3) Publicly traded companies focused on optics  
11           and photonics in the United States enable more than  
12           \$3 trillion in revenue annually.

13           (b) SENSE OF CONGRESS.—It is the sense of Con-  
14           gress that—

15           (1) optics and photonics research and tech-  
16           nologies promote United States global competitive-  
17           ness in industry sectors, including telecommuni-  
18           cations and information technology, energy,  
19           healthcare and medicine, manufacturing, and de-  
20           fense;

21           (2) Federal science agencies, industry, and aca-  
22           demia should seek partnerships with each other to  
23           develop basic research in optics and photonics into  
24           more mature technologies and capabilities; and

1           (3) each Federal science agency, as appropriate,  
2           should—

3                   (A) survey and identify optics and  
4                   photonics-related programs within that Federal  
5                   science agency and share results with other  
6                   Federal science agencies for the purpose of gen-  
7                   erating multiple applications and uses;

8                   (B) partner with the private sector and  
9                   academia to leverage knowledge and resources  
10                  to maximize opportunities for innovation in op-  
11                  tics and photonics;

12                  (C) explore research and development op-  
13                  portunities, including Federal and private sec-  
14                  tor-sponsored internships, to ensure a highly  
15                  trained optics and photonics workforce in the  
16                  United States;

17                  (D) encourage partnerships between aca-  
18                  demia and industry to promote improvement in  
19                  the education of optics and photonics techni-  
20                  cians at the secondary school level, under-  
21                  graduate level, and 2-year college level, includ-  
22                  ing through the Foundation's Advanced Tech-  
23                  nological Education program; and

24                  (E) assess existing programs and explore  
25                  alternatives to modernize photonics laboratory



1 equipment in undergraduate institutions in the  
2 United States to facilitate critical hands-on  
3 learning.

4 **SEC. 604. UNITED STATES CHIEF TECHNOLOGY OFFICER.**

5 (a) **SHORT TITLE.**—This section may be cited as the  
6 “United States Chief Technology Officer Act”.

7 (b) **IN GENERAL.**—Section 203 the National Science  
8 and Technology Policy, Organization, and Priorities Act  
9 of 1976 (42 U.S.C. 6612) is amended—

10 (1) by inserting “(b) **ASSOCIATE**  
11 **DIRECTORS.**—” before “The President is author-  
12 ized” and indenting appropriately;

13 (2) by inserting “(a) **IN GENERAL.**—” before  
14 “There shall be” and indenting appropriately; and

15 (3) by adding at the end the following:

16 “(c) **CHIEF TECHNOLOGY OFFICER.**—Subject to sub-  
17 section (b), the President is authorized to designate one  
18 of the Associate Directors under that subsection as a  
19 United States Chief Technology Officer.”.

20 **SEC. 605. NATIONAL RESEARCH COUNCIL STUDY ON TECH-**  
21 **NOLOGY FOR EMERGENCY NOTIFICATIONS**  
22 **ON CAMPUSES.**

23 (a) **IN GENERAL.**—Not later than 90 days after the  
24 date of enactment of this Act, the Director of the Office  
25 of Science and Technology Policy shall enter into an ar-

1 rangement with the National Research Council to conduct  
2 and complete a study to identify and review technologies  
3 employed at institutions of higher education to provide no-  
4 tifications to students, faculty, and other personnel during  
5 emergency situations in accordance with law.

6 (b) CONTENTS.—The study shall address—

7 (1) the timeliness of notifications provided by  
8 the technologies during emergency situations;

9 (2) the durability of the technologies in deliv-  
10 ering the notifications to students, faculty, and other  
11 personnel; and

12 (3) the limitations exhibited by the technologies  
13 to successfully deliver the notifications not more  
14 than 30 seconds after the institution of higher edu-  
15 cation transmits the notifications.

16 (c) REPORT REQUIRED.—Not later than 1 year after  
17 the date that the National Research Council enters into  
18 the arrangement under subsection (a), the Director of the  
19 Office of Science and Technology Policy shall submit to  
20 Congress a report on the study, including recommenda-  
21 tions for addressing any limitations identified under sub-  
22 section (b)(3).

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