

COMMITTEE PRINT

[Showing the text of H.R. 2225 as forwarded by the
Subcommittee on Research and Technology on May 13, 2021]

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “National Science
3 Foundation for the Future Act”.

4 **SEC. 2. FINDINGS.**

5 Congress finds the following:

6 (1) Over the past seven decades, the National
7 Science Foundation has played a critical role in ad-
8 vancing the United States academic research enter-
9 prise by supporting fundamental research and edu-
10 cation across science and engineering disciplines.

11 (2) Discoveries enabled by sustained investment
12 in fundamental research and the education of the
13 United States science and engineering workforce
14 have led to transformational innovations and
15 spawned new industries.

16 (3) While the traditional approach to invest-
17 ment in research has delivered myriad benefits to so-
18 ciety, a concerted effort is needed to ensure the ben-
19 efits of federally funded science and engineering are
20 enjoyed by all Americans.

1 (4) As countries around the world increase in-
2 vestments in research and STEM education, United
3 States global leadership in science and engineering is
4 eroding, posing significant risks to economic com-
5 petitiveness, national security, and public well-being.

6 (5) To address major societal challenges and
7 sustain United States leadership in innovation, the
8 Federal Government must increase investments in
9 research, broaden participation in the STEM work-
10 force, and bolster collaborations among universities,
11 National Laboratories, companies, non-profit
12 funders of research, local policymakers, civil societies
13 and stakeholder communities, and international
14 partners.

15 **SEC. 3. DEFINITIONS.**

16 In this Act:

17 (1) **ACADEMIES.**—The term “Academies”
18 means the National Academies of Sciences, Engi-
19 neering, and Medicine.

20 (2) **AWARDEE.**—The term “awardee” means
21 the legal entity to which Federal assistance is
22 awarded and that is accountable to the Federal Gov-
23 ernment for the use of the funds provided.

24 (3) **BOARD.**—The term “Board” means the Na-
25 tional Science Board.

1 (4) DIRECTOR.—The term “Director” means
2 the Director of the National Science Foundation.

3 (5) EMERGING RESEARCH INSTITUTION.—The
4 term “emerging research institution” means an in-
5 stitution of higher education with an established un-
6 dergraduate student program that has, on average
7 for 3 years prior to the time of application for an
8 award, received less than \$35,000,000 in Federal re-
9 search funding.

10 (6) FEDERAL SCIENCE AGENCY.—The term
11 “Federal science agency” means any Federal agency
12 with an annual extramural research expenditure of
13 over \$100,000,000.

14 (7) FOUNDATION.—The term “Foundation”
15 means the National Science Foundation.

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

20 (9) NON-PROFIT ORGANIZATION.—The term
21 “non-profit organization” means an organization
22 which is described in section 501(c)(3) of the Inter-
23 nal Revenue Code of 1986 and exempt from tax
24 under section 501(a) of such code.

1 (10) NSF INCLUDES.—The term “NSF in-
2 includes” means the initiative carried out under sec-
3 tion 6(c).

4 (11) PREK-12.—The term “preK-12” means
5 pre-kindergarten through grade 12.

6 (12) SKILLED TECHNICAL WORK.—The term
7 “skilled technical work” means an occupation that
8 requires a high level of knowledge in a technical do-
9 main and does not require a bachelor’s degree for
10 entry.

11 (13) STEM.—The term “STEM” has the
12 meaning given the term in section 2 of the America
13 COMPETES Reauthorization Act of 2010 (42
14 U.S.C. 6621 note).

15 **SEC. 4. AUTHORIZATION OF APPROPRIATIONS.**

16 (a) FISCAL YEAR 2022.—

17 (1) IN GENERAL.—There are authorized to be
18 appropriated to the Foundation \$11,469,200,000 for
19 fiscal year 2022.

20 (2) SPECIFIC ALLOCATIONS.—Of the amount
21 authorized under paragraph (1)—

22 (A) \$9,444,100,000 shall be made avail-
23 able to carry out research and related activities,
24 of which—

1 (i) \$208,150,000 shall be for the
2 Graduate Research Fellowship Program;

3 (ii) \$55,000,000 shall be for the Mid-
4 Scale Research Infrastructure Program;

5 and

6 (iii) \$1,000,000,000 shall be for the
7 Directorate for Science and Engineering
8 Solutions;

9 (B) \$1,333,860,000 shall be made avail-
10 able for education and human resources, of
11 which—

12 (i) \$73,700,000 shall be for the Rob-
13 ert Noyce Teacher Scholarship Program;

14 (ii) \$59,500,000 shall be for the NSF
15 Research Traineeship Program;

16 (iii) \$208,150,000 shall be for the
17 Graduate Research Fellowship Program;

18 and

19 (iv) \$66,000,000 shall be for the
20 Cybercorps Scholarship for Service Pro-
21 gram;

22 (C) \$190,000,000 shall be made available
23 for major research equipment and facilities con-
24 struction, of which \$65,000,000 shall be for the
25 Mid-Scale Research Infrastructure Program;

1 (D) \$473,500,000 shall be made available
2 for agency operations and award management;

3 (E) \$4,620,000 shall be made available for
4 the Office of the National Science Board; and

5 (F) \$23,120,000 shall be made available
6 for the Office of the Inspector General.

7 (b) FISCAL YEAR 2023.—

8 (1) IN GENERAL.—There are authorized to be
9 appropriated to the Foundation \$12,668,000,000 for
10 fiscal year 2023.

11 (2) SPECIFIC ALLOCATIONS.—Of the amount
12 authorized under paragraph (1)—

13 (A) \$10,367,460,000 shall be made avail-
14 able to carry out research and related activities,
15 of which—

16 (i) \$227,070,000 shall be for the
17 Graduate Research Fellowship Program;

18 (ii) \$60,000,000 shall be for the Mid-
19 Scale Research Infrastructure Program;
20 and

21 (iii) \$1,500,000,000 shall be for the
22 Directorate for Science and Engineering
23 Solutions;

1 (B) \$1,391,320,000 shall be made avail-
2 able for education and human resources, of
3 which—

4 (i) \$80,400,000 shall be for the Rob-
5 ert Noyce Teacher Scholarship Program;

6 (ii) \$64,910,000 shall be for the NSF
7 Research Traineeship Program;

8 (iii) \$227,070,000 shall be for the
9 Graduate Research Fellowship Program;
10 and

11 (iv) \$72,000,000 shall be for the
12 Cybercorps Scholarship for Service Pro-
13 gram;

14 (C) \$355,000,000 shall be made available
15 for major research equipment and facilities con-
16 struction, of which \$75,000,000 shall be for the
17 Mid-Scale Research Infrastructure Program;

18 (D) \$522,940,000 shall be made available
19 for agency operations and award management;

20 (E) \$4,660,000 shall be made available for
21 the Office of the National Science Board; and

22 (F) \$26,610,000 shall be made available
23 for the Office of the Inspector General.

24 (c) FISCAL YEAR 2024.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Foundation \$14,148,200,000 for
3 fiscal year 2024.

4 (2) SPECIFIC ALLOCATIONS.—Of the amount
5 authorized under paragraph (1)—

6 (A) \$11,702,420,000 shall be made avail-
7 able to carry out research and related activities,
8 of which—

9 (i) \$245,990,000 shall be for the
10 Graduate Research Fellowship Program;

11 (ii) \$70,000,000 shall be for the Mid-
12 Scale Research Infrastructure Program;

13 and

14 (iii) \$2,250,000,000 shall be for the
15 Directorate for Science and Engineering
16 Solutions;

17 (B) \$1,457,590,000 shall be made avail-
18 able for education and human resources, of
19 which—

20 (i) \$87,100,000 shall be for the Rob-
21 ert Noyce Teacher Scholarship Program;

22 (ii) \$70,320,000 shall be for the NSF
23 Research Traineeship Program;

1 (iii) \$245,990,000 shall be for the
2 Graduate Research Fellowship Program;
3 and

4 (iv) \$78,000,000 shall be for the
5 Cybercorps Scholarship for Service Pro-
6 gram;

7 (C) \$370,000,000 shall be made available
8 for major research equipment and facilities con-
9 struction, of which \$85,000,000 shall be for the
10 Mid-Scale Research Infrastructure Program;

11 (D) \$582,380,000 shall be made available
12 for agency operations and award management;

13 (E) \$4,700,000 shall be made available for
14 the Office of the National Science Board; and

15 (F) \$31,110,000 shall be made available
16 for the Office of the Inspector General.

17 (d) FISCAL YEAR 2025.—

18 (1) IN GENERAL.—There are authorized to be
19 appropriated to the Foundation \$16,036,900,000 for
20 fiscal year 2025.

21 (2) SPECIFIC ALLOCATIONS.—Of the amount
22 authorized under paragraph (1)—

23 (A) \$13,440,840,000 shall be made avail-
24 able to carry out research and related activities,
25 of which—

1 (i) \$264,920,000 shall be for the
2 Graduate Research Fellowship Program;

3 (ii) \$75,000,000 shall be for the Mid-
4 Scale Research Infrastructure Program;

5 and

6 (iii) \$3,375,000,000 shall be for the
7 Directorate for Science and Engineering
8 Solutions;

9 (B) \$1,522,890,000 shall be made avail-
10 able for education and human resources, of
11 which—

12 (i) \$93,800,000 shall be for the Rob-
13 ert Noyce Teacher Scholarship Program;

14 (ii) \$75,730,000 shall be for the NSF
15 Research Traineeship Program;

16 (iii) \$264,920,000 shall be for the
17 Graduate Research Fellowship Program;

18 and

19 (iv) \$84,000,000 shall be for the
20 Cybercorps Scholarship for Service Pro-
21 gram;

22 (C) \$372,000,000 shall be made available
23 for major research equipment and facilities con-
24 struction, of which \$90,000,000 shall be for the
25 Mid-Scale Research Infrastructure Program;

1 (D) \$661,830,000 shall be made available
2 for agency operations and award management;

3 (E) \$4,740,000 shall be made available for
4 the Office of the National Science Board; and

5 (F) \$34,610,000 shall be made available
6 for the Office of the Inspector General.

7 (e) FISCAL YEAR 2026.—

8 (1) IN GENERAL.—There are authorized to be
9 appropriated to the Foundation \$18,325,020,000 for
10 fiscal year 2026.

11 (2) SPECIFIC ALLOCATIONS.—Of the amount
12 authorized under paragraph (1)—

13 (A) \$15,549,390,000 shall be made avail-
14 able to carry out research and related activities,
15 of which—

16 (i) \$283,840,000 shall be for the
17 Graduate Research Fellowship Program;

18 (ii) \$80,000,000 shall be for the Mid-
19 Scale Research Infrastructure Program;
20 and

21 (iii) \$5,062,500,000 shall be for the
22 Directorate for Science and Engineering
23 Solutions;

1 (B) \$1,601,470,000 shall be made avail-
2 able for education and human resources, of
3 which—

4 (i) \$100,500,000 shall be for the Rob-
5 ert Noyce Teacher Scholarship Program;

6 (ii) \$81,140,000 shall be for the NSF
7 Research Traineeship Program;

8 (iii) \$283,840,000 shall be for the
9 Graduate Research Fellowship Program;
10 and

11 (iv) \$90,000,000 shall be for the
12 Cybercorps Scholarship for Service Pro-
13 gram;

14 (C) \$375,000,000 shall be made available
15 for major research equipment and facilities con-
16 struction, of which \$100,000,000 shall be for
17 the Mid-Scale Research Infrastructure Pro-
18 gram;

19 (D) \$756,270,000 shall be made available
20 for agency operations and award management;

21 (E) \$4,780,000 shall be made available for
22 the Office of the National Science Board; and

23 (F) \$38,110,000 shall be made available
24 for the Office of the Inspector General.

1 **SEC. 5. STEM EDUCATION.**

2 (a) PREK-12 STEM EDUCATION.—

3 (1) DECADAL SURVEY OF STEM EDUCATION RE-
4 SEARCH.—Not later than 45 days after the date of
5 enactment of this Act, the Director shall enter into
6 a contract with the Academies to review and assess
7 the status and opportunities for PreK–12 STEM
8 education research and make recommendations for
9 research priorities over the next decade.

10 (2) SCALING INNOVATIONS IN PREK-12 STEM
11 EDUCATION.—

12 (A) IN GENERAL.—The Director shall es-
13 tablish a program to award grants, on a com-
14 petitive basis, to institutions of higher edu-
15 cation or non-profit organizations (or consortia
16 of such institutions or organizations) to estab-
17 lish no fewer than 3 multidisciplinary Centers
18 for Transformative Education Research and
19 Translation (in this section referred to as “Cen-
20 ters”) to support research and development on
21 widespread and sustained implementation of
22 STEM education innovations.

23 (B) APPLICATION.—An institution of high-
24 er education or non-profit organization (or a
25 consortium of such institutions or organiza-
26 tions) seeking funding under subparagraph (A)

1 shall submit an application to the Director at
2 such time, in such manner, and containing such
3 information as the Director may require. The
4 application shall include, at a minimum, a de-
5 scription of how the proposed Center will—

6 (i) establish partnerships among aca-
7 demic institutions, local or State education
8 agencies, and other relevant stakeholders
9 in supporting programs and activities to
10 facilitate the widespread and sustained im-
11 plementation of promising, evidence-based
12 STEM education practices, models, pro-
13 grams, and technologies;

14 (ii) support enhanced STEM edu-
15 cation infrastructure, including
16 cyberlearning technologies, to facilitate the
17 widespread adoption of promising, evi-
18 dence-based practices;

19 (iii) support research and development
20 on scaling practices, partnerships, and al-
21 ternative models to current approaches, in-
22 cluding approaches sensitive to the unique
23 combinations of capabilities, resources, and
24 needs of varying localities, educators, and
25 learners;

1 (iv) include a focus on the learning
2 needs of under resourced schools and
3 learners in low-resource or underachieving
4 local education agencies in urban and rural
5 communities; and

6 (v) support research and development
7 on scaling practices and models to support
8 and sustain highly-qualified STEM edu-
9 cators in urban and rural communities.

10 (C) ADDITIONAL CONSIDERATIONS.—In
11 awarding a grant under this paragraph, the Di-
12 rector may also consider the extent to which the
13 proposed Center will—

14 (i) leverage existing collaborations,
15 tools, and strategies supported by the
16 Foundation, including NSF INCLUDES
17 and the Convergence Accelerators;

18 (ii) support research on and the devel-
19 opment and scaling of innovative ap-
20 proaches to distance learning and edu-
21 cation for various student populations;

22 (iii) support education innovations
23 that leverage new technologies or deepen
24 understanding of the impact of technology
25 on educational systems; and

1 (iv) include a commitment from local
2 or State education administrators to mak-
3 ing the proposed reforms and activities a
4 priority.

5 (D) PARTNERSHIP.—In carrying out the
6 program under subparagraph (A), the Director
7 shall explore opportunities to partner with the
8 Department of Education, including through
9 jointly funding activities under this paragraph.

10 (E) ANNUAL MEETING.—The Director
11 shall encourage and facilitate an annual meet-
12 ing of the Centers to foster collaboration among
13 the Centers and to further disseminate the re-
14 sults of the Centers' activities.

15 (F) REPORT.—Not later than 5 years after
16 the date of enactment of this Act, the Director
17 shall submit to Congress a report describing the
18 activities carried out pursuant to this para-
19 graph that includes—

20 (i) a description of the focus and pro-
21 posed goals of each Center; and

22 (ii) an assessment of the program's
23 success in helping to promote scalable solu-
24 tions in PreK-12 STEM education.

1 (3) NATIONAL ACADEMIES STUDY.—Not later
2 than 45 days after the date of enactment of this
3 Act, the Director shall enter into an agreement with
4 the Academies to conduct a study to—

5 (A) review the research literature and iden-
6 tify research gaps regarding the interconnected
7 factors that foster and hinder successful imple-
8 mentation of promising, evidence-based PreK-
9 12 STEM education innovations at the local,
10 regional, and national level;

11 (B) present a compendium of promising,
12 evidence-based PreK-12 STEM education prac-
13 tices, models, programs, and technologies;

14 (C) identify barriers to widespread and
15 sustained implementation of such innovations;
16 and

17 (D) make recommendations to the Founda-
18 tion, the Department of Education, the Na-
19 tional Science and Technology Council’s Com-
20 mittee on Science, Technology, Engineering,
21 and Mathematics Education, State and local
22 educational agencies, and other relevant stake-
23 holders on measures to address such barriers.

24 (b) UNDERGRADUATE STEM EDUCATION.—

1 (1) RESEARCH ON STEM EDUCATION AND
2 WORKFORCE NEEDS.—The Director shall award
3 grants, on a competitive basis, to four-year institu-
4 tions of higher education or non-profit organizations
5 (or consortia of such institutions or organizations) to
6 support research and development activities to—

7 (A) encourage greater collaboration and
8 coordination between institutions of higher edu-
9 cation and industry to enhance education and
10 improve alignment with workforce needs;

11 (B) understand the current composition of
12 the STEM workforce and the factors that influ-
13 ence growth, retention, and development of that
14 workforce; and

15 (C) increase the size, diversity, capability,
16 and flexibility of the STEM workforce.

17 (2) ADVANCED TECHNOLOGICAL EDUCATION
18 PROGRAM UPDATE.—Section 3(b) of the Scientific
19 and Advanced Technology Act of 1992 (42 U.S.C.
20 1862i(b)) is amended to read as follows:

21 “(b) NATIONAL COORDINATION NETWORK FOR
22 SCIENCE AND TECHNICAL EDUCATION.—The Director
23 shall award grants to institutions of higher education,
24 non-profit organizations, and associate-degree granting
25 colleges (or consortia of such institutions or organizations)

1 to establish a network of centers for science and technical
2 education. The centers shall—

3 “(1) coordinate research, training, and edu-
4 cation activities funded by awards under subsection
5 (a) and share information and best practices across
6 the network of awardees;

7 “(2) serve as a national and regional clearing-
8 house and resource to communicate and coordinate
9 research, training, and educational activities across
10 disciplinary, organizational, geographic, and inter-
11 national boundaries and disseminate best practices;
12 and

13 “(3) develop national and regional partnerships
14 between PreK–12 schools, two-year colleges, institu-
15 tions of higher education, workforce development
16 programs, and industry to meet workforce needs.”.

17 (3) INNOVATIONS IN STEM EDUCATION AT COM-
18 MUNITY COLLEGES.—

19 (A) IN GENERAL.—The Director shall
20 award grants on a merit-reviewed, competitive
21 basis to institutions of higher education or non-
22 profit organizations (or consortia of such insti-
23 tutions or organizations) to advance research on
24 the nature of learning and teaching at commu-
25 nity colleges and to improve outcomes for stu-

1 dents who enter the workforce upon completion
2 of their STEM degree or credential or transfer
3 to 4-year institutions, including by—

4 (i) examining how to scale up success-
5 ful programs at Community Colleges that
6 are improving student outcomes in
7 foundational STEM courses;

8 (ii) supporting research on effective
9 STEM teaching practices in community
10 college settings;

11 (iii) designing and developing new
12 STEM curricula;

13 (iv) providing STEM students with
14 hands-on training and research experi-
15 ences, internships, and other experiential
16 learning opportunities;

17 (v) increasing access to high quality
18 STEM education through new tech-
19 nologies;

20 (vi) re-skilling or up-skilling incum-
21 bent workers for new STEM jobs;

22 (vii) building STEM career and seam-
23 less transfer pathways; and

24 (viii) developing novel mechanisms to
25 identify and recruit talent into STEM pro-

1 grams, in particular talent from groups
2 historically underrepresented in STEM.

3 (B) PARTNERSHIPS.—In carrying out ac-
4 tivities under this paragraph, the Director shall
5 encourage applications to develop, enhance, or
6 expand cooperative STEM education and train-
7 ing partnerships between institutions of higher
8 education, industry, and labor organizations.

9 (c) GRADUATE STEM EDUCATION.—

10 (1) MENTORING AND PROFESSIONAL DEVELOP-
11 MENT.—

12 (A) MENTORING PLANS.—

13 (i) UPDATE.—Section 7008 of the
14 America Creating Opportunities to Mean-
15 ingfully Promote Excellence in Technology,
16 Education, and Science Act (42 U.S.C.
17 1862o) is amended by—

18 (I) inserting “and graduate stu-
19 dent” after “postdoctoral”; and

20 (II) inserting “The requirement
21 may be satisfied by providing such in-
22 dividuals with access to mentors, in-
23 cluding individuals not listed on the
24 grant.” after “review criterion.”.

1 (ii) EVALUATION.—Not later than 45
2 days after the date of enactment of this
3 Act, the Director shall enter into an agree-
4 ment with a qualified independent organi-
5 zation to evaluate the effectiveness of the
6 postdoctoral mentoring plan requirement
7 for improving mentoring for Foundation-
8 supported postdoctoral researchers.

9 (B) CAREER EXPLORATION.—

10 (i) IN GENERAL.—The Director shall
11 award grants, on a competitive basis, to in-
12 stitutions of higher education and non-
13 profit organizations (or consortia of such
14 institutions or organizations) to develop in-
15 novative approaches for facilitating career
16 exploration of academic and non-academic
17 career options and for providing oppor-
18 tunity-broadening experiences for graduate
19 students and postdoctoral scholars that
20 can then be considered, adopted, or adapt-
21 ed by other institutions and to carry out
22 research on the impact and outcomes of
23 such activities.

24 (ii) REVIEW OF PROPOSALS.—In se-
25 lecting grant recipients under this subpara-

1 graph, the Director shall consider, at a
2 minimum—

3 (I) the extent to which the ad-
4 ministrators of the institution are
5 committed to making the proposed ac-
6 tivity a priority; and

7 (II) the likelihood that the insti-
8 tution or organization will sustain or
9 expand the proposed activity effort be-
10 yond the period of the grant.

11 (C) DEVELOPMENT PLANS.—The Director
12 shall require that annual project reports for
13 awards that support graduate students and
14 postdoctoral scholars include certification by the
15 principal investigator that each graduate stu-
16 dent and postdoctoral scholar receiving substan-
17 tial support from such award, as determined by
18 the Director, in consultation with faculty advi-
19 sors, has developed and annually updated an in-
20 dividual development plan to map educational
21 goals, career exploration, and professional de-
22 velopment.

23 (D) PROFESSIONAL DEVELOPMENT SUP-
24 PLEMENT.—The Director shall carry out a five-
25 year pilot initiative to award up to 2,500 ad-

1 ministrative supplements of up to \$2,000 to ex-
2 isting research grants annually, on a competi-
3 tive basis, to support graduate student profes-
4 sional development experiences for graduate
5 students who receive a substantial portion of
6 their support under such grants, as determined
7 by the Director.

8 (E) GRADUATE EDUCATION RESEARCH.—

9 The Director shall award grants, on a competi-
10 tive basis, to institutions of higher education or
11 non-profit organizations (or consortia of such
12 institutions or organizations) to support re-
13 search on the graduate education system and
14 outcomes of various interventions and policies,
15 including—

16 (i) the effects of traineeships, fellow-
17 ships, internships, and teaching and re-
18 search assistantships on outcomes for
19 graduate students;

20 (ii) the effects of graduate education
21 and mentoring policies and procedures on
22 degree completion, including differences
23 across gender, race and ethnicity, and citi-
24 zenship; and

1 (iii) the development and assessment
2 of new or adapted interventions, including
3 approaches that improve mentoring rela-
4 tionships, develop conflict management
5 skills, and promote healthy research teams.

6 (2) GRADUATE RESEARCH FELLOWSHIP PRO-
7 GRAM UPDATE.—

8 (A) SENSE OF CONGRESS.—It is the sense
9 of Congress that the Foundation should in-
10 crease the number of new graduate research fel-
11 lows supported annually over the next 5 years
12 to no fewer than 3,000 fellows.

13 (B) PROGRAM UPDATE.—Section 10 of the
14 National Science Foundation Act of 1950 (42
15 U.S.C. 1869) is amended—

16 (i) in subsection (a), by inserting
17 “and as will address national workforce de-
18 mand in critical STEM fields” after
19 “throughout the United States”;

20 (ii) in subsection (b), by striking “of
21 \$12,000” and inserting “up to \$16,000”;
22 and

23 (iii) by adding at the end the fol-
24 lowing:

1 “(c) OUTREACH.—The Director shall ensure program
2 outreach to recruit fellowship applicants from fields of
3 study that are in areas of critical national need, from all
4 regions of the country, and from historically underrep-
5 resented populations in STEM.”.

6 (C) CYBERSECURITY SCHOLARSHIPS AND
7 GRADUATE FELLOWSHIPS.—The Director shall
8 ensure that students pursuing master’s degrees
9 and doctoral degrees in fields relating to cyber-
10 security are considered as applicants for schol-
11 arships and graduate fellowships under the
12 Graduate Research Fellowship Program under
13 section 10 of the National Science Foundation
14 Act of 1950 (42 U.S.C. 1869).

15 (3) STUDY ON GRADUATE STUDENT FUND-
16 ING.—

17 (A) IN GENERAL.—Not later than 45 days
18 after the date of enactment of this Act, the Di-
19 rector shall enter into an agreement with a
20 qualified independent organization to evalu-
21 ate—

22 (i) the role of the Foundation in sup-
23 porting graduate student education and
24 training through fellowships, traineeships,
25 and other funding models; and

1 (ii) the impact of different funding
2 mechanisms on graduate student experi-
3 ences and outcomes, including whether
4 such mechanisms have differential impacts
5 on subsets of the student population.

6 (B) REPORT.—Not later than 1 year after
7 the date of enactment of this Act, the organiza-
8 tion charged with carrying out the study under
9 subparagraph (A) shall publish the results of its
10 evaluation, including a recommendation for the
11 appropriate balance between fellowships,
12 traineeships, and other funding models.

13 (d) STEM WORKFORCE DATA.—

14 (1) SKILLED TECHNICAL WORKFORCE PORT-
15 FOLIO REVIEW.—

16 (A) IN GENERAL.—Not later than 1 year
17 after the date of enactment of this Act, the Di-
18 rector shall conduct a full portfolio analysis of
19 the Foundation’s skilled technical workforce in-
20 vestments across all Directorates in the areas of
21 education, research, infrastructure, data collec-
22 tion, and analysis.

23 (B) REPORT.—Not later than 180 days
24 after the date of the review under subparagraph
25 (A) is complete, the Director shall submit to

1 Congress and make widely available to the pub-
2 lic a summary report of the portfolio review.

3 (2) SURVEY DATA.—

4 (A) ROTATING TOPIC MODULES.—To meet
5 evolving needs for data on the state of the
6 science and engineering workforce, the Director
7 shall assess, through coordination with other
8 Federal statistical agencies and drawing on
9 input from relevant stakeholders, the feasibility
10 and benefits of incorporating questions or topic
11 modules to existing National Center for Science
12 and Engineering Statistics surveys that would
13 vary from cycle to cycle.

14 (B) NEW DATA.—Not later than 1 year
15 after the date of enactment of this Act, the Di-
16 rector shall submit to Congress and the Board
17 the results of an assessment, carried out in co-
18 ordination with other Federal agencies and with
19 input from relevant stakeholders, of the feasi-
20 bility and benefits of incorporating new ques-
21 tions or topic modules to existing National Cen-
22 ter for Science and Engineering Statistics sur-
23 veys on—

24 (i) the skilled technical workforce;

- 1 (ii) working conditions and work-life
2 balance;
3 (iii) harassment and discrimination;
4 (iv) sexual orientation and gender
5 identity;
6 (v) immigration and emigration; and
7 (vi) any other topics at the discretion
8 of the Director.

9 (C) LONGITUDINAL DESIGN.—The Direc-
10 tor shall continue and accelerate efforts to en-
11 hance the usefulness of National Center for
12 Science and Engineering Statistics survey data
13 for longitudinal research and analysis.

14 (D) GOVERNMENT ACCOUNTABILITY OF-
15 FICE REVIEW.—Not later than 1 year after the
16 date of enactment of this Act, the Comptroller
17 General of the United States shall submit a re-
18 port to Congress that—

- 19 (i) evaluates Foundation processes for
20 ensuring the data and analysis produced
21 by the National Center for Science and
22 Engineering Statistics meets current and
23 future needs; and

1 (ii) includes such recommendations as
2 the Comptroller General determines are
3 appropriate to improve such processes.

4 (e) CYBER WORKFORCE DEVELOPMENT RESEARCH
5 AND DEVELOPMENT.—

6 (1) IN GENERAL.—The Director shall award
7 grants on a merit-reviewed, competitive basis to in-
8 stitutions of higher education or non-profit organiza-
9 tions (of a consortia of thereof) to carry out research
10 on the cyber workforce.

11 (2) RESEARCH.—In carrying out research pur-
12 suant to paragraph (1), the Director shall support
13 research and development activities to—

14 (A) Understand the current state of the
15 cyber workforce, including factors that influence
16 growth, retention, and development of that
17 workforce;

18 (B) examine paths to entry and re-entry
19 into the cyber workforce;

20 (C) understand trends of the cyber work-
21 force, including demographic representation,
22 educational and professional backgrounds
23 present, competencies available, and factors
24 that shape employee recruitment, development,

1 and retention and how to increase the size, di-
2 versity, and capability of the cyber workforce;

3 (D) examine and evaluate training prac-
4 tices, models, programs, and technologies; and

5 (E) other closely related topics as the Di-
6 rector determines appropriate.

7 (3) REQUIREMENTS.—In carrying out the ac-
8 tivities described in paragraph (1), the Director
9 shall—

10 (A) collaborate with the National Institute
11 for Standards and Technology, including the
12 National Initiative for Cybersecurity Education,
13 the Department of Homeland Security, the De-
14 partment of Defense, the Office of Personnel
15 Management, and other Federal departments
16 and agencies, as appropriate;

17 (B) align with or build on the National
18 Initiative on Cybersecurity Education Cyberse-
19 curity Workforce Framework wherever prac-
20 ticable and applicable;

21 (C) leverage the collective body of knowl-
22 edge from existing cyber workforce development
23 research and education activities; and

24 (D) engage with other Federal depart-
25 ments and agencies, research communities, and

1 potential users of information produced under
2 this subsection.

3 **SEC. 6. BROADENING PARTICIPATION.**

4 (a) PRESIDENTIAL AWARDS FOR EXCELLENCE IN
5 MATHEMATICS AND SCIENCE TEACHING.—

6 (1) IN GENERAL.—Section 117(a) of the Na-
7 tional Science Foundation Authorization Act of 1988
8 (42 U.S.C.1881b(a)) is amended—

9 (A) in subparagraph (B)—

10 (i) by striking “108” and inserting
11 “110”;

12 (ii) by striking clause (iv);

13 (iii) in clause (v), by striking the pe-
14 riod at the end and inserting “; and”;

15 (iv) by redesignating clauses (i), (ii),
16 (iii), and (v) as subclauses (I), (II), (III),
17 and (IV), respectively, and moving the
18 margins of such subclauses (as so redesign-
19 ated) two ems to the right; and

20 (v) by striking “In selecting teachers”
21 and all that follows through “two teach-
22 ers—” and inserting the following:

23 “(C) In selecting teachers for an award au-
24 thorized by this subsection, the President shall
25 select—

1 “(i) at least two teachers—”; and

2 (B) in subparagraph (C), as designated by
3 paragraph (1)(A)(v), by adding at the end the
4 following:

5 “(ii) at least one teacher—

6 “(I) from the Commonwealth of
7 the Northern Mariana Islands;

8 “(II) from American Samoa;

9 “(III) from the Virgin Islands of
10 the United States; and

11 “(IV) from Guam.”.

12 (2) EFFECTIVE DATE.—The amendments made
13 by paragraph (1) shall apply with respect to awards
14 made on or after the date of the enactment of this
15 Act.

16 (b) ROBERT NOYCE TEACHER SCHOLARSHIP PRO-
17 GRAM UPDATE.—

18 (1) SENSE OF CONGRESS.—It is the sense of
19 Congress that over the next five years the Founda-
20 tion should increase the number of scholarships
21 awarded under the Robert Noyce Teacher Scholar-
22 ship program established under section 10 of the
23 National Science Foundation Authorization Act of
24 2002 (42 U.S.C. 1862n-1) by 50 percent.

1 (2) OUTREACH.—To increase the diversity of
2 participants, the Director shall support symposia, fo-
3 rums, conferences, and other activities to expand
4 and enhance outreach to—

5 (A) historically Black colleges and univer-
6 sities that are part B institutions, as defined in
7 section 322(2) of the Higher Education Act of
8 1965 (20 U.S.C. 1061(2));

9 (B) minority institutions, as defined in sec-
10 tion 365(3) of the Higher Education Act of
11 1965 (20 U.S.C. 1067k(3));

12 (C) institutions of higher education that
13 are located near or serve rural communities;

14 (D) emerging research institutions; and

15 (E) higher education programs that serve
16 or support veterans.

17 (c) NSF INCLUDES INITIATIVE.—The Director
18 shall award grants and cooperative agreements, on a com-
19 petitive basis, to institutions of higher education or non-
20 profit organizations (or consortia of such institutions or
21 organizations) to carry out a comprehensive national ini-
22 tiative to facilitate the development of networks and part-
23 nerships to build on and scale up effective practices in
24 broadening participation in STEM studies and careers of

1 groups historically underrepresented in such studies and
2 careers.

3 (d) BROADENING PARTICIPATION ON MAJOR FACILI-
4 TIES AWARDS.—The Director shall require organizations
5 seeking a cooperative agreement for the management of
6 the operations and maintenance of a Foundation project
7 to demonstrate prior experience and current capabilities
8 in employing best practices in broadening participation in
9 science and engineering and ensure implementation of
10 such practices is considered in oversight of the award.

11 (e) PARTNERSHIPS WITH EMERGING RESEARCH IN-
12 STITUTIONS.—The Director shall establish a five-year
13 pilot program to enhance partnerships between emerging
14 research institutions and institutions classified as very
15 high research activity by the Carnegie Classification of In-
16 stitutions of Higher Education at the time of application.
17 In carrying out this program, the Director shall—

18 (1) require that each proposal submitted by a
19 multi-institution collaboration for an award, includ-
20 ing those under section 9, that exceeds \$1,000,000,
21 as appropriate, specify how the applicants will sup-
22 port substantive, meaningful, and mutually-bene-
23 ficial partnerships with one or more emerging re-
24 search institutions;

1 (2) require awardees funded under paragraph
2 (1) to direct no less than 25 percent of the total
3 award to one or more emerging research institutions
4 to build research capacity, including through support
5 for faculty salaries and training, research experi-
6 ences for undergraduate and graduate students, and
7 maintenance and repair of research equipment and
8 instrumentation;

9 (3) require awardees funded under paragraph
10 (1) to report on the partnership activities as part of
11 the annual reporting requirements of the Founda-
12 tion;

13 (4) solicit feedback on the partnership directly
14 from partner emerging research institutions, in such
15 form as the Director deems appropriate; and

16 (5) submit a report to Congress after the third
17 year of the pilot program that includes—

18 (A) an assessment, drawing on feedback
19 from the research community and other sources
20 of information, of the effectiveness of the pilot
21 program for improving the quality of partner-
22 ships with emerging research institutions; and

23 (B) if deemed effective, a plan for perma-
24 nent implementation of the pilot program.

1 (f) TRIBAL COLLEGES AND UNIVERSITIES PROGRAM
2 UPDATE.—

3 (1) IN GENERAL.—Section 525 of the America
4 COMPETES Reauthorization Act of 2010 (42
5 U.S.C. 1862p–13) is amended—

6 (A) in subsection (a) by—

7 (i) striking “Native American” and
8 inserting “American Indian, Alaska Na-
9 tive, and Native Hawaiian”; and

10 (ii) inserting “post-secondary creden-
11 tials and” before “associate’s”; and

12 (iii) striking “or baccalaureate de-
13 grees” and inserting “, baccalaureate, and
14 graduate degrees”; and

15 (B) in subsection (b) by striking “under-
16 graduate”; and

17 (C) in subsection (c) by inserting “and
18 STEM” after “laboratory”.

19 (2) AUTHORIZATION OF APPROPRIATIONS.—

20 There is authorized to be appropriated to the Direc-
21 tor to carry out this program \$107,250,000 for fis-
22 cal year 2022 through fiscal year 2026.

23 (g) DIVERSITY IN TECH RESEARCH.—The Director
24 shall award grants, on a competitive basis, to institutions
25 of higher education or non-profit organizations (or con-

1 sortia of such institutions or organizations) to support
2 basic and applied research that yields a scientific evidence
3 base for improving the design and emergence, development
4 and deployment, and management and ultimate effective-
5 ness of organizations of all kinds, including research re-
6 lated to diversity, equity, and inclusion in the technology
7 sector.

8 (h) CONTINUING SUPPORT FOR EPSCoR.—

9 (1) SENSE OF CONGRESS.—

10 (A) IN GENERAL.—It is the sense of Con-
11 gress that—

12 (i) since maintaining the Nation’s sci-
13 entific and economic leadership requires
14 the participation of talented individuals na-
15 tionwide, EPSCoR investments into State
16 research and education capacities are in
17 the Federal interest and should be sus-
18 tained; and

19 (ii) EPSCoR should maintain its ex-
20 perimental component by supporting inno-
21 vative methods for improving research ca-
22 pacity and competitiveness.

23 (B) DEFINITION OF EPSCoR.—In this sub-
24 section, the term “EPSCoR” has the meaning
25 given the term in section 502 of the America

1 COMPETES Reauthorization Act of 2010 (42
2 U.S.C. 1862p note).

3 (2) UPDATE OF EPSCOR.—Section 517(f)(2) of
4 the America COMPETES Reauthorization Act of
5 2010 (42 U.S.C. 1862p–9(f)(2)) is amended—

6 (A) in subparagraph (A), by striking
7 “and” at the end; and

8 (B) by adding at the end the following:

9 “(C) to increase the capacity of rural com-
10 munities to provide quality STEM education
11 and STEM workforce development program-
12 ming to students, and teachers; and”.

13 **SEC. 7. FUNDAMENTAL RESEARCH.**

14 (a) BROADER IMPACTS.—

15 (1) ASSESSMENT.—Not later than 45 days
16 after the date of enactment of this Act, the Director
17 shall enter into an agreement with a qualified inde-
18 pendent organization to assess how the Broader Im-
19 pacts review criterion is applied across the Founda-
20 tion and make recommendations for improving the
21 effectiveness for meeting the goals established in sec-
22 tion 526 of the America Creating Opportunities to
23 Meaningfully Promote Excellence in Technology,
24 Education, and Science Reauthorization Act of 2010
25 (42 U.S.C. 1862p-14).

1 (2) ACTIVITIES.—The Director shall award
2 grants on a competitive basis, to institutions of high-
3 er education or non-profit organizations (or con-
4 sortia of such institutions or organizations) to sup-
5 port activities to increase the efficiency, effective-
6 ness, and availability of resources for implementing
7 the Broader Impacts review criterion, including—

8 (A) training and workshops for program
9 officers, merit review panelists, grant office ad-
10 ministrators, faculty, and students to improve
11 understanding of the goals and the full range of
12 potential broader impacts available to research-
13 ers to satisfy this criterion;

14 (B) repositories and clearinghouses for
15 sharing best practices and facilitating collabora-
16 tion; and

17 (C) tools for evaluating and documenting
18 societal impacts of research.

19 (b) SENSE OF CONGRESS.—It is the sense of Con-
20 gress that the Director should continue to identify oppor-
21 tunities to reduce the administrative burden on research-
22 ers.

23 (c) RESEARCH INTEGRITY AND SECURITY.—

24 (1) OFFICE OF RESEARCH SECURITY AND POL-
25 ICY.—The Director shall maintain a Research Secu-

1 rity and Policy office within the Office of the Direc-
2 tor with no fewer than 4 full time equivalent posi-
3 tions, in addition to the Chief of Research Security
4 established in paragraph (2) of this subsection. The
5 functions of the Research Security and Policy office
6 shall be to coordinate all research security policy
7 issues across the Foundation, including by—

8 (A) consulting and coordinating with the
9 Foundation Office of Inspector General and
10 with other Federal science agencies and intel-
11 ligence and law enforcement agencies, as appro-
12 priate, through the National Science and Tech-
13 nology Council in accordance with the authority
14 provided under section 1746 of the National
15 Defense Authorization Act for Fiscal Year 2020
16 (Public Law 116–92; 42 U.S.C. 6601 note), to
17 identify and address potential security risks
18 that threaten research integrity and other risks
19 to the research enterprise;

20 (B) serving as the Foundation’s primary
21 resource for all issues related to the security
22 and integrity of the conduct of Foundation-sup-
23 ported research;

1 (C) conducting outreach and education ac-
2 tivities for awardees on research policies and
3 potential security risks;

4 (D) educating Foundation program man-
5 agers and other directorate staff on evaluating
6 Foundation awards and awardees for potential
7 security risks; and

8 (E) communicating reporting and disclo-
9 sure requirements to awardees and applicants
10 for funding.

11 (2) CHIEF OF RESEARCH SECURITY.—The Di-
12 rector shall appoint a senior agency official within
13 the Office of the Director as a Chief of Research Se-
14 curity, whose primary responsibility is to manage the
15 office established under paragraph (1).

16 (3) REPORT TO CONGRESS.—No later than 180
17 days after the date of enactment of this Act, the Di-
18 rector shall provide a report to the Committee on
19 Science, Space, and Technology of the House of
20 Representatives, the Committee on Commerce,
21 Science, and Transportation of the Senate, the Com-
22 mittee on Appropriations of the House of Represent-
23 atives, and the Committee on Appropriations of the
24 Senate on the resources and the number of full time

1 employees needed to carry out the functions of the
2 Office established in paragraph (1).

3 (4) ONLINE RESOURCE.—The Director shall de-
4 velop an online resource hosted on the Foundation’s
5 website containing up-to-date information, tailored
6 for institutions and individual researchers, includ-
7 ing—

8 (A) an explanation of Foundation research
9 security policies;

10 (B) unclassified guidance on potential se-
11 curity risks that threaten scientific integrity
12 and other risks to the research enterprise;

13 (C) examples of beneficial international
14 collaborations and how such collaborations dif-
15 fer from foreign government interference efforts
16 that threaten research integrity;

17 (D) promising practices for mitigating se-
18 curity risks that threaten research integrity;
19 and

20 (E) additional reference materials, includ-
21 ing tools that assist organizations seeking
22 Foundation funding and awardees in informa-
23 tion disclosure to the Foundation.

24 (5) RISK ASSESSMENT CENTER.—The Director
25 shall enter into an agreement with a qualified inde-

1 pendent organization to create a new risk assess-
2 ment center to—

3 (A) help the Foundation develop the online
4 resources under paragraph (4); and

5 (B) help awardees in assessing and identi-
6 fying issues related to nondisclosure of current
7 and pending research funding, risks to the
8 Foundation merit review process, and other
9 issues that may negatively affect the Founda-
10 tion proposal and award process due to undue
11 foreign interference.

12 (6) RESEARCH GRANTS.—The Director shall
13 continue to award grants, on a competitive basis, to
14 institutions of higher education or non-profit organi-
15 zations (or consortia of such institutions or organi-
16 zations) to support research on the conduct of re-
17 search and the research environment, including re-
18 search on research misconduct or breaches of re-
19 search integrity and detrimental research practices.

20 (7) AUTHORITIES.—

21 (A) IN GENERAL.—In addition to existing
22 authorities for preventing waste, fraud, abuse,
23 and mismanagement of federal funds, the Di-
24 rector, acting through the Office of Research
25 Security and Policy and in coordination with

1 the Foundation's Office of Inspector General,
2 shall have the authority to—

3 (i) conduct risk assessments, including
4 through the use of open-source analysis
5 and analytical tools, of research and devel-
6 opment award applications and disclosures
7 to the Foundation, in coordination with the
8 Risk Assessment Center established in
9 paragraph (5);

10 (ii) request the submission to the
11 Foundation, by an institution of higher
12 education or other organization applying
13 for a research and development award, of
14 supporting documentation, including copies
15 of contracts, grants, or any other agree-
16 ment specific to foreign appointments, em-
17 ployment with a foreign institution, partici-
18 pation in a foreign talent program and
19 other information reported as current and
20 pending support for all covered individuals
21 in a research and development award ap-
22 plication; and

23 (iii) upon receipt and review of the in-
24 formation provided under clause (ii) and in
25 consultation with the institution of higher

1 education or other organization submitting
2 such information, initiate the substitution
3 or removal of a covered individual from a
4 research and development award, reduce
5 the award funding amount, or suspend or
6 terminate the award if the Director deter-
7 mines such contracts, grants, or agree-
8 ments include obligations that—

9 (I) interfere with the capacity for
10 Foundation-supported activities to be
11 carried out; or

12 (II) create duplication with
13 Foundation-supported activities.

14 (B) LIMITATIONS.—In exercising the au-
15 thorities under this paragraph, the Director
16 shall—

17 (i) take necessary steps, as prac-
18 ticable, to protect the privacy of all covered
19 individuals and other parties involved in
20 the application and disclosure assessments
21 under clause (A)(i);

22 (ii) endeavor to provide justification
23 for requests for supporting documentation
24 made under clause (A)(ii);

1 (iii) require that allegations be proven
2 by a preponderance of evidence; and

3 (iv) as practicable, afford subjects an
4 opportunity to provide comments and re-
5 buttal and an opportunity to appeal before
6 final administrative action is taken.

7 (8) SECURITY TRAINING MODULES.—

8 (A) IN GENERAL.—Not later than 90 days
9 after the date of enactment of this Act, the Di-
10 rector, in collaboration with the Director of the
11 National Institutes of Health and other relevant
12 Federal research agencies, shall enter into an
13 agreement or contract with a qualified entity
14 for the development of online research security
15 training modules for the research community,
16 including modules focused on international col-
17 laboration and international travel, foreign in-
18 terference, and rules for proper use of funds,
19 disclosure, conflict of commitment, and conflict
20 of interest.

21 (B) STAKEHOLDER INPUT.—Prior to en-
22 tering into the agreement under clause (A), the
23 Director shall seek input from academic, private
24 sector, intelligence, and law enforcement stake-
25 holders regarding the scope and content of

1 training modules, including the diversity of
2 needs across institutions of higher education
3 and other grantees of different sizes and types,
4 and recommendations for minimizing adminis-
5 trative burden on institutions of higher edu-
6 cation and researchers.

7 (C) DEVELOPMENT.—The Director shall
8 ensure that the entity identified in (A)—

9 (i) develops modules that can be
10 adapted and utilized across Federal science
11 agencies; and

12 (ii) develops and implements a plan
13 for regularly updating the modules as
14 needed.

15 (D) GUIDELINES.—The Director, in col-
16 laboration with the Director of the National In-
17 stitutes of Health, shall develop guidelines for
18 institutions of higher education and other orga-
19 nizations receiving Federal research and devel-
20 opment funds to use in developing their own
21 training programs to address the unique needs,
22 challenges, and risk profiles of such institu-
23 tions, including adoption of training modules
24 developed under this paragraph.

1 (E) IMPLEMENTATION.—Drawing on
2 stakeholder input under subparagraph (B), not
3 later than 12 months after the date of enact-
4 ment of this Act, the Director shall establish a
5 requirement that, as part of an application for
6 a research and development award from the
7 Foundation—

8 (i) each covered individual listed on
9 the application for a research and develop-
10 ment award certify that they have com-
11 pleted research security training that
12 meets the guidelines developed under
13 clause (D) within one year of the applica-
14 tion; and

15 (ii) each institution of higher edu-
16 cation or other organization applying for
17 such award certify that each covered indi-
18 vidual who is employed by the institution
19 or organization and listed on the applica-
20 tion has been made aware of the require-
21 ment under this subparagraph.

22 (F) DEFINITIONS.—In this subsection:

23 (i) COVERED INDIVIDUAL.—The term
24 “covered individual” means the principal
25 investigator, co-principal investigators, and

1 any other person at the institution who is
2 responsible for the design, conduct, or re-
3 porting of research or educational activities
4 funded or proposed for funding by the
5 Foundation.

6 (ii) FEDERAL RESEARCH AGENCY.—
7 The term “Federal research agency”
8 means any Federal agency with an annual
9 extramural research expenditure of over
10 \$100,000,000.

11 (iii) RESEARCH AND DEVELOPMENT
12 AWARD.—The term “research and develop-
13 ment award” means support provided to
14 an individual or entity by a Federal re-
15 search agency to carry out research and
16 development activities, which may include
17 support in the form of a grant, contract,
18 cooperative agreement, or other such
19 transaction. The term does not include a
20 grant, contract, agreement or other trans-
21 action for the procurement of goods or
22 services to meet the administrative needs
23 of a Federal research agency.

24 (9) RESPONSIBLE CONDUCT IN RESEARCH
25 TRAINING.—Section 7009 of the America Creating

1 Opportunities to Meaningfully Promote Excellence in
2 Technology, Education, and Science Act (42 U.S.C.
3 1862o-1) is amended by—

4 (A) striking “and postdoctoral research-
5 ers” and inserting “postdoctoral researchers,
6 faculty, and other senior personnel”; and

7 (B) inserting the following at the end: “,
8 including mentor training”.

9 (10) NATIONAL ACADEMIES GUIDE TO RESPON-
10 SIBLE CONDUCT IN RESEARCH.—

11 (A) IN GENERAL.—Not later than 180
12 days after the date of enactment of this Act,
13 the Director shall enter into an agreement with
14 the Academies to update the report entitled
15 “On Being a Scientist: A Guide to Responsible
16 Conduct in Research” issued by the Academies.
17 The report, as so updated, shall include—

18 (i) updated professional standards of
19 conduct in research;

20 (ii) promising practices for preventing,
21 addressing, and mitigating the negative
22 impact of harassment, including sexual
23 harassment and gender harassment as de-
24 fined in the 2018 Academies report enti-
25 tled “Sexual Harassment of Women: Cli-

1 mate, Culture, and Consequences in Aca-
2 demic Sciences, Engineering, and Medi-
3 cine”; and

4 (iii) promising practices for mitigating
5 potential security risks that threaten re-
6 search integrity.

7 (B) REPORT.—Not later than 18 months
8 after the effective date of the agreement under
9 subparagraph (A), the Academies, as part of
10 such agreement, shall submit to the Director
11 and the Committee on Science, Space, and
12 Technology of the House of Representatives
13 and the Committee on Commerce, Science, and
14 Transportation of the Senate the report re-
15 ferred to in such subparagraph, as updated pur-
16 suant to such subparagraph.

17 (d) RESEARCH ETHICS.—

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

20 (A) a number of emerging areas of re-
21 search have potential ethical, social, safety, and
22 security implications that might be apparent as
23 early as the basic research stage;

24 (B) the incorporation of ethical, social,
25 safety, and security considerations into the re-

1 search design and review process for Federal
2 awards, may help mitigate potential harms be-
3 fore they happen;

4 (C) the Foundation's agreement with the
5 Academies to conduct a study and make rec-
6 ommendations with respect to governance of re-
7 search in emerging technologies is a positive
8 step toward accomplishing this goal; and

9 (D) the Foundation should continue to
10 work with stakeholders to understand and
11 adopt policies that promote best practices for
12 governance of research in emerging technologies
13 at every stage of research.

14 (2) ETHICS STATEMENTS.—Drawing on stake-
15 holder input, not later than 18 months after the
16 date of enactment of this Act, the Director shall
17 amend award proposal instructions to include a re-
18 quirement for an ethics statement to be included as
19 part of any proposal for funding prior to making the
20 award. Such statement shall be considered by the
21 Director in the review of proposals, taking into con-
22 sideration any relevant input from the peer-reviewers
23 for the proposal, and shall factor into award deci-
24 sions as deemed necessary by the Director. Such
25 statements may include, as appropriate—

1 (A) any foreseeable or quantifiable risks to
2 society, including how the research could enable
3 products, technologies, or other outcomes that
4 could intentionally or unintentionally cause sig-
5 nificant societal harm;

6 (B) how technical or social solutions can
7 mitigate such risks and, as appropriate, a plan
8 to implement such mitigation measures; and

9 (C) how partnerships and collaborations in
10 the research can help mitigate potential harm
11 and amplify potential societal benefits.

12 (3) GUIDANCE.—The Director shall solicit
13 stakeholder input to develop clear guidance on what
14 constitutes a foreseeable or quantifiable risk as de-
15 scribed in paragraph (2)(A), and to the extent prac-
16 ticable harmonize this policy with existing ethical
17 policies or related requirements for human subjects.

18 (4) RESEARCH.—The Director shall award
19 grants, on a competitive basis, to institutions of
20 higher education or non-profit organizations (or con-
21 sortia of such institutions or organizations) to sup-
22 port—

23 (A) research to assess the potential ethical
24 and societal implications of Foundation-sup-
25 ported research and products or technologies

1 enabled by such research, including the benefits
2 and risks identified pursuant to paragraph
3 (2)(A); and

4 (B) the development and verification of ap-
5 proaches to proactively mitigate foreseeable
6 risks to society, including the technical and so-
7 cial solutions identified pursuant to paragraph
8 (2)(B).

9 (5) ANNUAL REPORT.—The Director shall en-
10 courage awardees to update their ethics statements
11 as appropriate as part of the annual reports re-
12 quired by all awardees under the award terms and
13 conditions.

14 (e) RESEARCH REPRODUCIBILITY AND
15 REPLICABILITY.—Consistent with existing Federal law for
16 privacy, intellectual property, and security, the Director
17 shall facilitate the public access to research products, in-
18 cluding data, software, and code, developed as part of
19 Foundation-supported projects.

20 (1) DATA MANAGEMENT PLANS.—

21 (A) The Director shall require that every
22 proposal for funding for research include a ma-
23 chine-readable data management plan that in-
24 cludes a description of how the awardee will ar-
25 chive and preserve public access to data, soft-

1 ware, and code developed as part of the pro-
2 posed project.

3 (B) In carrying out the requirement in
4 subparagraph (A), the Director shall—

5 (i) provide necessary resources, in-
6 cluding trainings and workshops, to edu-
7 cate researchers and students on how to
8 develop and review high quality data man-
9 agement plans;

10 (ii) ensure program officers and merit
11 review panels are equipped with the re-
12 sources and training necessary to review
13 the quality of data management plans; and

14 (iii) ensure program officers and
15 merit review panels treat data management
16 plans as essential elements of grant pro-
17 posals, where appropriate.

18 (2) OPEN REPOSITORIES.—The Director
19 shall—

20 (A) coordinate with the heads of other
21 Federal science agencies, and solicit input from
22 the scientific community, to develop and widely
23 disseminate a set of criteria for trusted open re-
24 positories, accounting for discipline-specific
25 needs and necessary protections for sensitive in-

1 formation, to be used by Federally funded re-
2 searchers for the sharing of data, software, and
3 code;

4 (B) work with stakeholders to identify sig-
5 nificant gaps in available repositories meeting
6 the criteria developed under subparagraph (A)
7 and options for supporting the development of
8 additional or enhanced repositories;

9 (C) award grants on a competitive basis to
10 institutions of higher education or non-profit
11 organizations (or consortia of such institutions
12 or organizations) for the development, up-
13 grades, and maintenance of open data reposi-
14 tories that meet the criteria developed under
15 subparagraph (A);

16 (D) work with stakeholders and build on
17 existing models, where appropriate, to establish
18 a single, public, web-based point of access to
19 help users locate repositories storing data, soft-
20 ware, and code resulting from or used in Foun-
21 dation-supported projects;

22 (E) work with stakeholders to establish the
23 necessary policies and procedures and allocate
24 the necessary resources to ensure, as prac-
25 ticable, data underlying published findings re-

1 sulting from Foundation-supported projects are
2 deposited in repositories meeting the criteria
3 developed under subparagraph (A) at the time
4 of publication;

5 (F) incentivize the deposition of data, soft-
6 ware, and code into repositories that meet the
7 criteria developed under subparagraph (A); and

8 (G) coordinate with the scientific pub-
9 lishing community to develop uniform consensus
10 standards around data archiving and sharing.

11 (3) RESEARCH, DEVELOPMENT, AND EDU-
12 CATION.—The Director shall award grants, on a
13 competitive basis to institutions of higher education
14 or non-profit organizations (or consortia of such in-
15 stitutions or organizations) to—

16 (A) support research and development of
17 open source, sustainable, usable tools and infra-
18 structure that support reproducibility for a
19 broad range of studies across different dis-
20 ciplines;

21 (B) support research on computational re-
22 producibility, including the limits of reproduc-
23 ibility and the consistency of computational re-
24 sults in the development of new computation
25 hardware, tools, and methods; and

1 (C) support the education and training of
2 students, faculty, and researchers on computa-
3 tional methods, tools, and techniques to improve
4 the quality and sharing of data, code, and sup-
5 porting metadata to produce reproducible re-
6 search.

7 (f) CLIMATE CHANGE RESEARCH.—

8 (1) IN GENERAL.—The Director shall award
9 grants, on a competitive basis, to institutions of
10 higher education or non-profit organizations (or con-
11 sortia of such institutions or organizations) to sup-
12 port research to improve our understanding of the
13 climate system and related human and environ-
14 mental systems.

15 (2) USE OF FUNDS.—Activities funded by a
16 grant under this subsection may include—

17 (A) fundamental research on climate
18 forcings, feedbacks, responses, and thresholds
19 in the earth system;

20 (B) research on climate-related human be-
21 haviors and institutions;

22 (C) research on climate-related risk, vul-
23 nerability, resilience, and adaptive capacity of
24 coupled human-environment systems, including

1 risks to ecosystem stability and risks to vulner-
2 able populations;

3 (D) research to support the development
4 and implementation of effective social strategies
5 and tools for mitigating and adapting to climate
6 change, including at the local level;

7 (E) improved modeling, projections, anal-
8 yses, and assessments of climate and other
9 Earth system changes;

10 (F) the development of effective strategies
11 for educating and training future climate
12 change researchers, and climate change re-
13 sponse and mitigation professionals, in both re-
14 search and development methods, as well as
15 community engagement and science commu-
16 nication; and

17 (G) the development of effective strategies
18 for public and community engagement in the all
19 stages of the research and development process.

20 (g) VIOLENCE RESEARCH.—

21 (1) IN GENERAL.—The Director shall award
22 grants, on a competitive basis, to institutions of
23 higher education or non-profit organizations (or con-
24 sortia of such institutions or organizations) to sup-
25 port research to improve our understanding of the

1 nature, scope, causes, consequences, prevention, and
2 response to all forms of violence.

3 (2) USE OF FUNDS.—Activities funded by a
4 grant under this subsection may include—

5 (A) research on the magnitude and dis-
6 tribution of fatal and nonfatal violence;

7 (B) research on risk and protective factors;

8 (C) research on the design, development,
9 implementation, and evaluation of interventions
10 for preventing and responding to violence;

11 (D) research on scaling up effective inter-
12 ventions; and

13 (E) one or more interdisciplinary research
14 centers to conduct violence research, foster new
15 and expanded collaborations, and support ca-
16 pacity building activities to increase the number
17 and diversity of new researchers trained in
18 cross-disciplinary violence research.

19 (h) SOCIAL, BEHAVIORAL, AND ECONOMIC
20 SCIENCES.—The Director shall—

21 (1) actively communicate opportunities and so-
22 licit proposals for social, behavioral, and economic
23 science researchers to participate in cross-cutting
24 and interdisciplinary programs, including the Con-

1 vergence Accelerator and Big Ideas activities, and
2 the Mid-Scale Research Infrastructure program; and

3 (2) ensure social, behavioral, and economic
4 science researchers are represented on relevant merit
5 review panels for such activities.

6 (i) **FOOD-ENERGY-WATER RESEARCH.**—The Director
7 shall award grants on a competitive basis to institutions
8 of higher education or non-profit organizations (or con-
9 sortia of such institutions or organizations) to—

10 (1) support research to significantly advance
11 our understanding of the food-energy-water system
12 through quantitative and computational modeling,
13 including support for relevant cyberinfrastructure;

14 (2) develop real-time, cyber-enabled interfaces
15 that improve understanding of the behavior of food-
16 energy-water systems and increase decision support
17 capability;

18 (3) support research that will lead to innovative
19 solutions to critical food-energy-water system prob-
20 lems; and

21 (4) grow the scientific workforce capable of
22 studying and managing the food-energy-water sys-
23 tem, through education and other professional devel-
24 opment.

1 (j) SUSTAINABLE CHEMISTRY RESEARCH AND EDU-
2 CATION.—In accordance with section 263 of the National
3 Defense Authorization Act for Fiscal Year 2021, the Di-
4 rector shall carry out activities in support of sustainable
5 chemistry, including—

6 (1) establishing a program to award grants, on
7 a competitive basis, to institutions of higher edu-
8 cation or non-profit organizations (or consortia of
9 such institutions or organizations) to support—

10 (A) individual investigators and teams of
11 investigators, including to the extent prac-
12 ticable, early career investigators for research
13 and development;

14 (B) collaborative research and development
15 partnerships among universities, industry, and
16 non-profit organizations; and

17 (C) integrating sustainable chemistry prin-
18 ciples into elementary, secondary, under-
19 graduate, and graduate chemistry and chemical
20 engineering curriculum and research training,
21 as appropriate to that level of education and
22 training; and

23 (2) incorporating sustainable chemistry into ex-
24 isting Foundation research and development pro-
25 grams.

1 (k) RISK AND RESILIENCE RESEARCH.—The Direc-
2 tor shall award grants on a competitive basis to institu-
3 tions of higher education or non-profit organizations (or
4 consortia of such institutions or organizations) to advance
5 knowledge of risk assessment and predictability and to
6 support the creation of tools and technologies for in-
7 creased resilience through—

8 (1) improvements in our ability to understand,
9 model, and predict extreme events and natural haz-
10 ards, including pandemics;

11 (2) the creation of novel engineered systems so-
12 lutions for resilient complex infrastructures, particu-
13 larly those that address critical interdependence
14 among infrastructures and leverage the growing in-
15 fusion of cyber-physical-social components into the
16 infrastructures;

17 (3) development of equipment and instrumenta-
18 tion for innovation in resilient engineered infrastruc-
19 tures; and

20 (4) multidisciplinary research on the behaviors
21 individuals and communities engage in to detect,
22 perceive, understand, predict, assess, mitigate, and
23 prevent risks and to improve and increase resilience.

24 (l) LEVERAGING INTERNATIONAL EXPERTISE IN RE-
25 SEARCH.—The Director shall explore and advance oppor-

1 tunities for leveraging international capabilities and re-
2 sources that align with the Foundation and United States
3 research community priorities and have the potential to
4 benefit United States prosperity, security, health, and
5 well-being, including by sending teams of Foundation sci-
6 entific staff for site visits of scientific facilities and agen-
7 cies in other countries.

8 (m) BIOLOGICAL RESEARCH COLLECTIONS.—

9 (1) IN GENERAL.—The Director shall continue
10 to support databases, tools, methods, and other ac-
11 tivities that secure and improve existing physical and
12 digital biological research collections, improve the ac-
13 cessibility of collections and collection-related data
14 for research and educational purposes, develop ca-
15 pacity for curation and collection management, and
16 to transfer ownership of collections that are signifi-
17 cant to the biological research community, including
18 to museums and universities.

19 (2) SPECIMEN MANAGEMENT PLAN.—The Di-
20 rector shall require that every proposal for funding
21 for research that involves collecting or generating
22 specimens include a specimen management plan that
23 includes a description of how the specimens and as-
24 sociated data will be accessioned into and perma-

1 nently maintained in an established biological collec-
2 tion.

3 (3) ACTION CENTER FOR BIOLOGICAL COLLEC-
4 TIONS.—The Director shall award grants on a com-
5 petitive basis to institutions of higher education or
6 non-profit organizations (or consortia of such insti-
7 tutions or organizations) to establish an Action Cen-
8 ter for Biological Collections to facilitate coordina-
9 tion and data sharing among communities of prac-
10 tice for research, education, workforce training, eval-
11 uation, and business model development.

12 (n) CLEAN WATER RESEARCH AND TECHNOLOGY
13 ACCELERATION.—The Director shall award grants on a
14 competitive, merit-reviewed basis to institutions of higher
15 education or non-profit organizations (or consortia of such
16 institutions or organizations) to—

17 (1) support transdisciplinary research to signifi-
18 cantly advance our understanding of water avail-
19 ability, quality, and dynamics and the impact of
20 human activity and a changing climate on urban and
21 rural water and wastewater systems;

22 (2) develop, pilot and deploy innovative tech-
23 nologies, systems, and other approaches to identi-
24 fying and addressing challenges that affect water
25 availability, quality, and security, including through

1 direct engagement with affected communities and
2 partnerships with the private sector, State, tribal,
3 and local governments, non-profit organizations and
4 water management professionals; and

5 (3) grow the scientific workforce capable of
6 studying and managing water and wastewater sys-
7 tems, through education, training, and other profes-
8 sional development.

9 (o) TECHNOLOGY AND BEHAVIORAL SCIENCE RE-
10 SEARCH.—The Director shall award grants on a merit-
11 based, competitive basis for research to—

12 (1) increase understanding of social media and
13 consumer technology access and use patterns and re-
14 lated psychological and behavioral issues, particu-
15 larly for adolescents; and

16 (2) explore the role of social media and con-
17 sumer technology in rising rates of depressive symp-
18 toms, suicidal ideation, drug use, and deaths of de-
19 spair, particularly for communities experiencing
20 long-term economic distress.

21 (p) MANUFACTURING RESEARCH AMENDMENT.—
22 Section 506(a) of the America COMPETES Reauthoriza-
23 tion Act of 2010 (42 U.S.C. 1862p–1(a)) is amended—

24 (1) in paragraph (5), by striking “and” at the
25 end;

1 (2) in paragraph (6)—

2 (A) by striking “and” before “virtual man-
3 ufacturing”; and

4 (B) by striking the period at the end and
5 inserting “; and artificial intelligence and ma-
6 chine learning; and”; and

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

8 “(7) additive manufacturing, including new ma-
9 terial designs, complex materials, rapid printing
10 techniques, and real-time process controls.”.

11 **SEC. 8. RESEARCH INFRASTRUCTURE.**

12 (a) FACILITY OPERATION AND MAINTENANCE.—

13 (1) IN GENERAL.—The Director shall continue
14 the Facility Operation Transition pilot program for
15 a total of five years.

16 (2) COST SHARING.—The Facility Operation
17 Transition program shall provide funding for 10–50
18 percent of the operations and maintenance costs for
19 major research facilities that are within the first five
20 years of operation, where the share is determined
21 based on—

22 (A) the operations and maintenance costs
23 of the major research facility; and

24 (B) the capacity of the managing direc-
25 torate or division to absorb such costs.

1 (3) REPORT.—After the fifth year of the pilot
2 program, the Director shall transmit a report to
3 Congress that includes—

4 (A) an assessment, that includes feedback
5 from the research community, of the effective-
6 ness of the pilot program for—

7 (i) supporting research directorates
8 and divisions in balancing investments in
9 research grants and funding for the initial
10 operation and maintenance of major facili-
11 ties;

12 (ii) incentivizing the development of
13 new world-class facilities;

14 (iii) facilitating interagency and inter-
15 national partnerships;

16 (iv) funding core elements of multi-
17 disciplinary facilities; and

18 (v) supporting facility divestment
19 costs; and

20 (B) if deemed effective, a plan for perma-
21 nent implementation of the pilot program.

22 (b) REVIEWS.—The Director shall periodically carry
23 out reviews within each of the directorates and divisions
24 to assess the cost and benefits of extending the operations

1 of research facilities that have exceeded their planned
2 operational lifespan.

3 (c) HELIUM CONSERVATION.—

4 (1) MAJOR RESEARCH INSTRUMENTATION SUP-
5 PORT.—

6 (A) IN GENERAL.—The Director shall sup-
7 port, through the Major Research Instrumenta-
8 tion program, proposal requests that include
9 the purchase, installation, operation, and main-
10 tenance of equipment and instrumentation to
11 reduce consumption of helium.

12 (B) COST SHARING.—The Director may
13 waive the cost-sharing requirement for helium
14 conservation measures for non-Ph.D.-granting
15 institutions of higher education and Ph.D.-
16 granting institutions of higher education that
17 are not ranked among the top 100 institutions
18 receiving Federal research and development
19 funding, as documented by the National Center
20 for Science and Engineering Statistics.

21 (2) ANNUAL REPORT.—No later than 1 year
22 after the date of enactment of this Act and annually
23 for the subsequent two years, the Director shall sub-
24 mit an annual report to Congress on the use of
25 funding awarded by the Foundation for the purchase

1 and conservation of helium. The report should in-
2 clude—

3 (A) the volume and price of helium pur-
4 chased;

5 (B) changes in pricing and availability of
6 helium; and

7 (C) any supply disruptions impacting a
8 substantial number of institutions.

9 (d) ADVANCED COMPUTING.—

10 (1) COMPUTING NEEDS.—To gather informa-
11 tion about the computational needs of Foundation-
12 funded projects, the Director shall require grant pro-
13 posals submitted to the Foundation, as appropriate,
14 to include estimates of computational resource needs
15 for projects that require use of advanced computing.
16 The Director shall encourage and provide access to
17 tools that facilitate the inclusion of these measures,
18 including those identified in the 2016 Academies re-
19 port entitled “Future Directions for NSF Advanced
20 Computing Infrastructure to Support U.S. Science
21 and Engineering in 2017–2020”.

22 (2) REPORTS.—The Director shall document
23 and publish every two years a summary of the
24 amount and types of advanced computing capabili-

1 ties that are needed to fully meet the Foundation’s
2 project needs as identified under paragraph (1).

3 (3) ROADMAP.—To set priorities and guide
4 strategic decisions regarding investments in ad-
5 vanced computing capabilities, the Director shall de-
6 velop, publish, and regularly update a 5-year ad-
7 vanced computing roadmap that—

8 (A) describes the advanced computing re-
9 sources and capabilities that would fully meet
10 anticipated project needs, including through in-
11 vestments in the Mid-Scale Research Infra-
12 structure program and the Major Research
13 Equipment and Facilities Construction account;

14 (B) draws on community input, informa-
15 tion contained in research proposals, allocation
16 requests, insights from Foundation-funded
17 cyber-infrastructure operators, and Foundation-
18 wide information gathering regarding commu-
19 nity needs;

20 (C) considers computational needs of
21 planned major facilities;

22 (D) reflects anticipated technology trends;

23 (E) informs users and potential partners
24 about future facilities and services;

1 (F) addresses the needs of groups histori-
2 cally underrepresented in STEM and geo-
3 graphic regions with low availability and high
4 demand for advanced computing resources;

5 (G) considers how Foundation-supported
6 advanced computing capabilities can be lever-
7 aged for activities through the Directorate for
8 Science and Engineering Solutions; and

9 (H) provides an update to Congress about
10 the level of funding necessary to fully meet
11 computational resource needs for the research
12 community.

13 (e) NATIONAL SECURE DATA SERVICE.—

14 (1) IN GENERAL.—The Director, in consulta-
15 tion with the Chief Statistician of the United States,
16 shall establish a demonstration project to develop,
17 refine and test models to inform the full implemen-
18 tation of the Commission on Evidence-Based Policy-
19 making recommendation for a government-wide data
20 linkage and access infrastructure for statistical ac-
21 tivities conducted for statistical purposes, as defined
22 in chapter 35 of title 44, United States Code.

23 (2) ESTABLISHMENT.—Not later than one year
24 after the date of enactment of this Act, the Director
25 shall establish a National Secure Data Service dem-

1 onstration project. The National Secure Data Serv-
2 ice demonstration project shall be—

3 (A) aligned with the principles, best prac-
4 tices, and priority actions recommended by the
5 Advisory Committee on Data for Evidence
6 Building, to the extent feasible; and

7 (B) operated directly by or via a contract
8 that is managed by the National Center for
9 Science and Engineering Statistics.

10 (3) DATA.—In carrying out this subsection, the
11 Director shall engage with Federal and State agen-
12 cies to collect, acquire, analyze, report, and dissemi-
13 nate statistical data in the United States and other
14 nations to support governmentwide evidence-building
15 activities consistent with the Foundations for Evi-
16 dence-Based Policymaking Act of 2018.

17 (4) PRIVACY AND CONFIDENTIALITY PROTEC-
18 TIONS.—If the Director issues a management con-
19 tract under paragraph (2), the awardee shall be des-
20 ignated as an “agent” under chapter 35 of title 44,
21 United States Code, subchapter III, section 3561 et
22 seq., with all requirements and obligations for pro-
23 tecting confidential information delineated in the
24 Confidential Information Protection and Statistical
25 Efficiency Act of 2018 and the Privacy Act of 1974.

1 (5) TECHNOLOGY.—In carrying out this sub-
2 section, the Director shall consider application and
3 use of systems and technologies that incorporate
4 protection measures to reasonably ensure confiden-
5 tial data and statistical products are protected in ac-
6 cordance with obligations under chapter 35 of title
7 44, United States Code, subchapter III, section
8 3561 et seq., including systems and technologies
9 that ensure raw data and other sensitive inputs are
10 not accessible to recipients of statistical outputs
11 from the National Secure Data Service demonstra-
12 tion project.

13 (6) TRANSPARENCY.—The National Secure
14 Data Service established under paragraph (2) shall
15 maintain a public website with up-to-date informa-
16 tion on supported projects.

17 (7) REPORT.—Not later than 2 years after the
18 date of enactment of this Act, the National Secure
19 Data Service demonstration project established
20 under paragraph (2) shall submit a report to Con-
21 gress that includes—

22 (A) a description of policies for protecting
23 data, consistent with applicable federal law;

1 (B) a comprehensive description of all
2 completed or active data linkage activities and
3 projects;

4 (C) an assessment of the effectiveness of
5 the demonstration project for mitigating risks
6 and removing barriers to a sustained implemen-
7 tation of the National Secure Data Service as
8 recommended by the Commission on Evidence-
9 Based Policymaking; and

10 (D) if deemed effective by the Director, a
11 plan for scaling up the demonstration project to
12 facilitate data access for evidence building while
13 ensuring transparency and privacy.

14 (8) AUTHORIZATION OF APPROPRIATIONS.—
15 There are authorized to be appropriated to the Di-
16 rector to carry out this subsection \$9,000,000 for
17 each of fiscal years 2022 through 2026.

18 **SEC. 9. DIRECTORATE FOR SCIENCE AND ENGINEERING**
19 **SOLUTIONS.**

20 (a) ESTABLISHMENT.—Subject to the availability of
21 appropriated funds, there is established within the Foun-
22 dation the Directorate for Science and Engineering Solu-
23 tions to advance research and development solutions to ad-
24 dress societal and national challenges for the benefit of
25 all Americans.

1 (b) PURPOSE.—The purpose of the Directorate estab-
2 lished under subsection (a) is to accelerate the translation
3 of Foundation-supported fundamental research and to ad-
4 vance technologies, support use-inspired research, facili-
5 tate commercialization and use of Federally funded re-
6 search, and expand the pipeline of United States students
7 and researchers in areas of societal and national impor-
8 tance.

9 (c) ACTIVITIES.—The Director shall achieve the pur-
10 poses described in subsection (a) by awarding financial as-
11 sistance through the Directorate to—

12 (1) support transformational advances in use-
13 inspired and translational research through diverse
14 funding mechanisms and models, including conver-
15 gence accelerators;

16 (2) translate research into science and engineer-
17 ing innovations, including through developing inno-
18 vative approaches to connect research with societal
19 outcomes, education and training for students and
20 researchers on engaging with end users and the pub-
21 lic, partnerships that facilitate research uptake, ap-
22 plication, and scaling, prototype development, entre-
23 preneurial education, developing tech-to-market
24 strategies, and partnerships that connect research
25 products to businesses, accelerators, and incubators;

1 (3) develop and expand sustainable and mutu-
2 ally-beneficial use-inspired and translational research
3 and development partnerships and collaborations
4 among institutions of higher education, including
5 minority serving institutions and emerging research
6 institutions, non-profit organizations, businesses and
7 other for-profit entities, Federal or State agencies,
8 community organizations, other Foundation direc-
9 torates, national labs, international entities as ap-
10 appropriate, and other organizations;

11 (4) build capacity for use-inspired and
12 translational research at institutions of higher edu-
13 cation, including necessary administrative support;

14 (5) expand opportunities for researchers to con-
15 tribute to use-inspired and translational research in-
16 cluding through support for workshops and con-
17 ferences, targeted incentives and training, and multi-
18 disciplinary research centers;

19 (6) support the education, mentoring, and
20 training of undergraduate students, graduate stu-
21 dents, and postdoctoral researchers in use-inspired
22 and translational approaches to research in key
23 focus areas identified under subsection (g) through
24 scholarships, fellowships, and traineeships;

1 (7) support translational research infrastruc-
2 ture, including platforms and testbeds, data manage-
3 ment and software tools, and networks and commu-
4 nication platforms for interactive and collective
5 learning and information sharing; and

6 (8) identify social, behavioral, and economic
7 drivers and consequences of technological innova-
8 tions.

9 (d) ASSISTANT DIRECTOR.—

10 (1) IN GENERAL.—The Director shall appoint
11 an Assistant Director responsible for the manage-
12 ment of the Directorate established under this sec-
13 tion.

14 (2) TERM LIMIT.—The Assistant Director ap-
15 pointed under paragraph (1) shall serve a term last-
16 ing no longer than 4 years.

17 (3) QUALIFICATIONS.—The Assistant Director
18 shall be an individual, who by reason of professional
19 background and experience, is specially qualified
20 to—

21 (A) advise the Director on all matters per-
22 taining to use-inspired and translational re-
23 search, development, and commercialization at
24 the Foundation, including partnership with the

1 private sector and other users of Foundation
2 funded research; and

3 (B) develop and implement the necessary
4 policies and procedures to promote a culture of
5 use-inspired and translational research within
6 the Directorate and across the Foundation and
7 carry out the responsibilities under paragraph
8 (4).

9 (4) RESPONSIBILITIES.—The responsibilities of
10 the Assistant Director shall include—

11 (A) advising the Director on all matters
12 pertaining to use-inspired and translational re-
13 search and development activities at the Foun-
14 dation, including effective practices for conver-
15 gence research;

16 (B) identifying opportunities for and facili-
17 tating coordination and collaboration, where ap-
18 propriate, on use-inspired and translational re-
19 search, development, commercialization, and so-
20 cietal application activities—

21 (i) among the offices, directorates,
22 and divisions within the Foundation; and

23 (ii) between the Foundation and
24 stakeholders in academia, the private sec-
25 tor, including non-profit entities, labor or-

1 ganizations, Federal or State agencies, and
2 international entities, as appropriate;

3 (C) ensuring that the activities carried out
4 under this section are not duplicative of activi-
5 ties supported by other parts of the Foundation
6 or other relevant Federal agencies;

7 (D) approving all new programs within the
8 Directorate;

9 (E) developing and testing diverse merit-
10 review models and mechanisms for selecting
11 and providing awards for use-inspired and
12 translational research and development at dif-
13 ferent scales, from individual investigator
14 awards to large multi-institution collaborations;

15 (F) assessing the success of programs;

16 (G) administering awards to achieve the
17 purposes described in subsection (b); and

18 (H) performing other such duties per-
19 taining to the purposes in subsection (b) as are
20 required by the Director.

21 (5) RELATIONSHIP TO THE DIRECTOR.—The
22 Assistant Director shall report to the Director.

23 (6) RELATIONSHIP TO OTHER PROGRAMS.—No
24 other directorate within the Foundation shall report
25 to the Assistant Director.

1 (e) ADVISORY COMMITTEE.—

2 (1) IN GENERAL.—In accordance with the Fed-
3 eral Advisory Committee Act (5 U.S.C. App.) the
4 Director shall establish an advisory committee to as-
5 sess, and make recommendations regarding, the ac-
6 tivities carried out under this section.

7 (2) MEMBERSHIP.—The advisory committee
8 members shall—

9 (A) be individuals with relevant experience
10 or expertise, including individuals from industry
11 and national labs, educators, academic subject
12 matter experts, technology transfer experts, and
13 representatives of civil society and other non-
14 governmental organizations; and

15 (B) consist of at least 10 members broadly
16 representative of stakeholders, including no less
17 than 3 members from the private sector, none
18 of whom shall be an employee of the Federal
19 Government.

20 (3) RESPONSIBILITIES.—The Committee shall
21 be responsible for—

22 (A) reviewing and evaluating activities car-
23 ried out under this section; and

1 (B) assessing the success of the Direc-
2 torate in and proposing new strategies for ful-
3 filling the purposes in subsection (b).

4 (f) EXISTING PROGRAMS.—The Convergence Accel-
5 erator, the Growing Convergence Research Big Idea, and
6 any other program, at the discretion of the Director, may
7 be managed by the Directorate.

8 (g) FOCUS AREAS.—In consultation with the Assist-
9 ant Director, the Board, and other Federal agencies and
10 taking into account advice under subsection (e), the Direc-
11 tor shall identify, and regularly update, up to 5 focus
12 areas to guide activities under this section. In selecting
13 such focus areas, the Director shall consider the following
14 societal challenges:

15 (1) Climate change and environmental sustain-
16 ability.

17 (2) Global competitiveness in critical tech-
18 nologies.

19 (3) Cybersecurity.

20 (4) National security.

21 (5) STEM education and workforce.

22 (6) Social and economic inequality.

23 (h) TRANSFER OF FUNDS.—

24 (1) IN GENERAL.—Funds made available to
25 carry out this section shall be available for transfer

1 to other offices, directorates, or divisions within the
2 Foundation for such use as is consistent with the
3 purposes for which such funds are provided.

4 (2) PROHIBITION ON TRANSFER FROM OTHER
5 OFFICES.—No funds shall be available for transfer
6 to the Directorate established under this section
7 from other offices, directorates, or divisions within
8 the Foundation.

9 (i) AUTHORITIES.—In addition to existing authorities
10 available to the Foundation, the Director may exercise the
11 following authorities in carrying out the activities under
12 this section:

13 (1) AWARDS.—In carrying out this section, the
14 Director may provide awards in the form of grants,
15 contracts, cooperative agreements, cash prizes, and
16 other transactions.

17 (2) APPOINTMENTS.—The Director shall have
18 the authority to—

19 (A) make appointments of scientific, engi-
20 neering, and professional personnel without re-
21 gard to the civil service laws as the Director de-
22 termines necessary for carrying out research
23 and development functions which require the
24 services of specially qualified personnel relating
25 to the focus areas identified under subsection

1 (g) and such other areas of national research
2 priorities as the Director may determine; and

3 (B) fix the basic pay of such personnel at
4 rates not in excess of the basic rate of pay of
5 the Vice President under section 104 of title 3,
6 United States Code, without regard to the civil
7 service laws.

8 (j) ETHICAL, LEGAL, AND SOCIETAL CONSIDER-
9 ATIONS.—The Director shall establish policies and set up
10 formal avenues for public input, as appropriate, to ensure
11 that ethical, legal, and societal considerations are explicitly
12 integrated into the priorities for the Directorate, including
13 the selection of focus areas under subsection (g), the
14 award-making process, and throughout all stages of sup-
15 ported projects.

16 (k) REPORTS AND ROADMAPS.—

17 (1) ANNUAL REPORT.—The Director shall pro-
18 vide to the relevant authorizing and appropriations
19 committees of Congress an annual report describing
20 projects supported by the Directorate during the
21 previous year.

22 (2) ROADMAP.—Not later than 1 year after the
23 date of enactment of this Act, the Director shall pro-
24 vide to the relevant authorizing and appropriations
25 committees of Congress a roadmap describing the

1 strategic vision that the Directorate will use to guide
2 investment decisions over the following 3 years.

3 (l) EVALUATION.—

4 (1) IN GENERAL.—After the Directorate has
5 been in operation for 6 years, the National Science
6 Board shall evaluate how well the Directorate is
7 achieving the purposes identified in subsection (b),
8 including an assessment of the impact of Directorate
9 activities on the Foundation’s primary science mis-
10 sion.

11 (2) INCLUSIONS.—The evaluation shall in-
12 clude—

13 (A) a recommendation on whether the Di-
14 rectorate should be continued or terminated;
15 and

16 (B) a description of lessons learned from
17 operation of the Directorate.

18 (3) AVAILABILITY.—On completion of the eval-
19 uation, the evaluation shall be made available to
20 Congress and the public.

21 (m) LIMITATION.—No amounts may be appropriated
22 for the Directorate for each of fiscal years 2022, 2023,
23 2024, 2025, or 2026 unless—

24 (1) a specific appropriation is made for the Di-
25 rectorate; and

1 (2) the amount appropriated for the activities
2 of the Foundation, other than the activities author-
3 ized under this section, for each such fiscal year ex-
4 ceeds the amount appropriated for the Foundation
5 for fiscal year 2021, as adjusted for inflation in ac-
6 cordance with the Consumer Price Index published
7 by the Bureau of Labor Statistics of the Depart-
8 ment of Labor.

9 **SEC. 10. ADMINISTRATIVE AMENDMENTS.**

10 (a) SUPPORTING VETERANS IN STEM CAREERS.—
11 Section 3(c) of the Supporting Veterans in STEM Careers
12 Act is amended by striking “annual” and inserting “bien-
13 nial”.

14 (b) SUNSHINE ACT COMPLIANCE.—Section 15 of the
15 National Science Foundation Authorization Act of 2002
16 is amended—

17 (1) so that paragraph (3) reads as follows:

18 “(3) COMPLIANCE REVIEW.—The Inspector
19 General of the Foundation shall conduct a review of
20 the compliance by the Board with the requirements
21 described in paragraph (2) as necessary based on a
22 triennial risk assessment. Any review deemed nec-
23 essary shall examine the proposed and actual con-
24 tent of closed meetings and determine whether the

1 closure of the meetings was consistent with section
2 552b of title 5, United States Code.”; and

3 (2) by striking paragraphs (4) and (5) and in-
4 serting the following:

5 “(4) MATERIALS RELATING TO CLOSED POR-
6 TIONS OF MEETING.—To facilitate the risk assess-
7 ment required under paragraph (3) of this sub-
8 section, and any subsequent review conducted by the
9 Inspector General, the Office of the National Science
10 Board shall maintain the General Counsel’s certifi-
11 cate, the presiding officer’s statement, and a tran-
12 script or recording of any closed meeting, for at
13 least 3 years after such meeting.”.

14 (c) SCIENCE AND ENGINEERING INDICATORS RE-
15 PORT SUBMISSION.—Section 4(j)(1) of the National
16 Science Foundation Act of 1950 (42 U.S.C. 1863(j)(1))
17 is amended by striking “January 15” and inserting
18 “March 15”.

19 **SEC. 11. PLANNING AND CAPACITY BUILDING GRANTS.**

20 Section 602 of the American Innovation and Com-
21 petitiveness Act (42 U.S.C. 1862s–9) is amended—

22 (1) by redesignating subsection (e) as sub-
23 section (f); and

24 (2) by inserting after subsection (d), the fol-
25 lowing:

1 “(e) PLANNING AND CAPACITY BUILDING GRANTS.—

2 “(1) IN GENERAL.—Under the program estab-
3 lished in section 508 of the America COMPETES
4 Reauthorization Act of 2010 (42 U.S.C. 1862p–2)
5 and the activities authorized under this section, the
6 Director shall award grants to eligible entities for
7 planning and capacity building at institutions of
8 higher education.

9 “(2) ELIGIBLE ENTITY DEFINED.—In this sub-
10 section, the term ‘eligible entity’ means an institu-
11 tion of higher education (or a consortium of such in-
12 stitutions) that, according to the data published by
13 the National Center for Science and Engineering
14 Statistics, is not, on average, among the top 100 in-
15 stitutions in Federal R&D expenditures during the 3
16 year period prior to the year of the award.

17 “(3) USE OF FUNDS.—In addition to activities
18 listed under subsection (c), an eligible entity receiv-
19 ing a grant under this subsection may use funds
20 to—

21 “(A) ensure the availability of staff, includ-
22 ing technology transfer professionals, entre-
23 preneurs in residence, and other mentors as re-
24 quired to accomplish the purpose of this sub-
25 section;

1 “(B) revise institution policies, including
2 policies related to intellectual property and fac-
3 ulty entrepreneurship, and taking other nec-
4 essary steps to implement relevant best prac-
5 tices for academic technology transfer;

6 “(C) develop new local and regional part-
7 nerships among institutions of higher education
8 and between institutions of higher education
9 and private sector entities and other relevant
10 organizations with the purpose of building net-
11 works, expertise, and other capacity to identify
12 promising research that may have potential
13 market value and enable researchers to pursue
14 further development and transfer of their ideas
15 into possible commercial or other use;

16 “(D) develop seminars, courses, and other
17 educational opportunities for students, post-doc-
18 toral researchers, faculty, and other relevant
19 staff at institutions of higher education to in-
20 crease awareness and understanding of entre-
21 preneurship, patenting, business planning, and
22 other areas relevant to technology transfer, and
23 connect students and researchers to relevant re-
24 sources, including mentors in the private sector;
25 and

1 “(E) create and fund competitions to allow
2 entrepreneurial students and faculty to illus-
3 trate the commercialization potential of their
4 ideas.

5 “(4) MINIMUM DURATION AND SIZE OF
6 AWARD.—Grants awarded under this subsection
7 shall be at least 3 years in duration and \$500,000
8 in total amount.

9 “(5) APPLICATION.—An eligible entity seeking
10 funding under this subsection shall submit an appli-
11 cation to the Director of the Foundation at such
12 time, in such manner, and containing such informa-
13 tion and assurances as such Director may require.
14 The application shall include, at a minimum, a de-
15 scription of how the eligible entity submitting an ap-
16 plication plans to sustain the proposed activities be-
17 yond the duration of the grant.

18 “(6) AUTHORIZATION OF APPROPRIATIONS.—
19 From within funds authorized under section 9, there
20 are authorized to carry out the activities under this
21 subsection \$40 million for each of fiscal years 2022
22 through 2026.”.

