

116TH CONGRESS
1ST SESSION

S. 2579

To direct the Director of the Office of Science and Technology Policy to carry out programs and activities to ensure that Federal science agencies and institutions of higher education receiving Federal research and development funding are fully engaging their entire talent pool, and for other purposes.

IN THE SENATE OF THE UNITED STATES

SEPTEMBER 26, 2019

Ms. HIRONO (for herself, Mr. BLUMENTHAL, Ms. CANTWELL, Ms. CORTEZ MASTO, Ms. DUCKWORTH, Mrs. GILLIBRAND, Ms. KLOBUCHAR, Mr. MARKEY, Mr. MERKLEY, and Ms. ROSEN) introduced the following bill; which was read twice and referred to the Committee on Health, Education, Labor, and Pensions

A BILL

To direct the Director of the Office of Science and Technology Policy to carry out programs and activities to ensure that Federal science agencies and institutions of higher education receiving Federal research and development funding are fully engaging their entire talent pool, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS; FINDINGS.**

2 (a) **SHORT TITLE.**—This Act may be cited as the
3 “STEM Opportunities Act of 2019”.

4 (b) **TABLE OF CONTENTS.**—The table of contents for
5 this Act is as follows:

- Sec. 1. Short title; table of contents; findings.
- Sec. 2. Purposes.
- Sec. 3. Federal science agency policies for caregivers.
- Sec. 4. Collection and reporting of data on Federal research grants.
- Sec. 5. Policies for review of Federal research grants.
- Sec. 6. Collection of data on demographics of faculty.
- Sec. 7. Cultural and institutional barriers to expanding the academic and Federal STEM workforce.
- Sec. 8. Research and dissemination at the National Science Foundation.
- Sec. 9. Research and related activities to expand STEM opportunities.
- Sec. 10. Tribal Colleges and Universities Program.
- Sec. 11. Report to Congress.
- Sec. 12. Merit review.
- Sec. 13. Definitions.

6 (c) **FINDINGS.**—The Congress finds the following:

7 (1) Many reports over the past decade have
8 found that it is critical to our Nation’s economic
9 leadership and global competitiveness that the
10 United States educates and trains more scientists
11 and engineers.

12 (2) Research shows that women and minorities
13 who are interested in STEM careers are dispro-
14 tionately lost at nearly every educational transition
15 and at every career milestone.

16 (3) The National Center for Science and Engi-
17 neering Statistics at the National Science Founda-
18 tion collects, compiles, analyzes, and publishes data

1 on the demographics of STEM degrees and STEM
2 jobs in the United States.

3 (4) Women now earn nearly 37 percent of all
4 STEM bachelor's degrees, but major variations per-
5 sist among fields. In 2017, women earned only 20
6 percent of all bachelor's degrees awarded in engi-
7 neering and 19 percent of bachelor's degrees award-
8 ed in computer sciences. Based on Bureau of Labor
9 Statistics data, jobs in computing occupations are
10 expected to account for nearly 60 percent of the pro-
11 jected annual growth of newly created STEM job
12 openings from 2016 to 2026.

13 (5) In 2017, underrepresented minority groups
14 comprised 39 percent of the college-age population
15 of the United States, but only 18 percent of stu-
16 dents who earned bachelor's degrees in STEM fields.
17 The Higher Education Research Institute at the
18 University of California, Los Angeles, found that,
19 while freshmen from underrepresented minority
20 groups express an interest in pursuing a STEM un-
21 dergraduate degree at the same rate as all other
22 freshmen, only 22.1 percent of Latino students, 18.4
23 percent of African-American students, and 18.8 per-
24 cent of Native American students studying in STEM
25 fields complete their degree within 5 years, com-

1 pared to approximately 33 percent of White students
2 and 42 percent of Asian students who complete their
3 degree within 5 years.

4 (6) In some STEM fields, including the com-
5 puter sciences, women persist at about the same rate
6 through doctorate degrees. In other STEM fields,
7 women persist through doctorate degrees at a lower
8 rate. In mathematics, women earn just 26 percent of
9 doctorate degrees compared with 42 percent of un-
10 dergraduate degrees. Overall, women earned 38 per-
11 cent of STEM doctorate degrees in 2016. The rate
12 of minority students earning STEM doctorate de-
13 grees in physics is 9 percent, compared with 15 per-
14 cent for bachelor's degree. Students from underrep-
15 resented minority groups accounted for only 11.5
16 percent of STEM doctorate degrees awarded in
17 2016.

18 (7) The representation of women in STEM
19 drops significantly from the doctorate degree level to
20 the faculty level. Overall, women hold only 26 per-
21 cent of all tenured and tenure-track positions and 27
22 percent of full professor positions in STEM fields in
23 our Nation's universities and 4-year colleges. Black
24 and Hispanic faculty together hold about 6.8 percent
25 of all tenured and tenure-track positions and 7.5

1 percent of full professor positions. Many of the num-
2 bers in the American Indian or Alaskan Native and
3 Native Hawaiian or Other Pacific Islander cat-
4 egories for different faculty ranks were too small for
5 the National Science Foundation to report publicly
6 without potentially compromising confidential infor-
7 mation about the individuals being surveyed.

8 (8) The representation of women is especially
9 low at our Nation's top research universities. Even
10 in the biological sciences, in which women now earn
11 more than 50 percent of the doctorates and passed
12 the 25 percent level 37 years ago, women make up
13 only 25 percent of the full professors at the approxi-
14 mately 100 most research-intensive universities in
15 the United States. In the physical sciences and
16 mathematics, women make up only 11 percent of full
17 professors, in computer sciences only 10 percent,
18 and across engineering fields only 7 percent. The
19 data suggest that approximately 6 percent of all ten-
20 ure-track STEM faculty members at the most re-
21 search-intensive universities are from underrep-
22 resented minority groups, but in some fields the
23 numbers are too small to report publicly.

24 (9) By 2050, underrepresented minorities will
25 comprise 52 percent of the college-age population of

1 the United States. If the percentage of female stu-
2 dents and students from underrepresented minority
3 groups earning bachelor's degrees in STEM fields
4 does not significantly increase, the United States
5 will face an acute shortfall in the overall number of
6 students who earn degrees in STEM fields just as
7 United States companies are increasingly seeking
8 students with those skills. With this impending
9 shortfall, the United States will almost certainly lose
10 its competitive edge in the 21st century global econ-
11 omy.

12 (10) According to a 2014 Association for
13 Women in Science survey of over 4,000 scientists
14 across the globe, 70 percent of whom were men,
15 STEM researchers face significant challenges in
16 work-life integration. Researchers in the United
17 States were among the most likely to experience a
18 conflict between work and their personal life at least
19 weekly. One-third of researchers surveyed said that
20 ensuring good work-life integration has negatively
21 impacted their careers, and, of researchers intending
22 to leave their current job within the next year, 9
23 percent indicated it was because they were unable to
24 balance work and life demands.

1 (11) Female students and students from under-
2 represented minority groups at institutions of higher
3 education who see few others “like themselves”
4 among faculty and student populations often do not
5 experience the social integration that is necessary for
6 success in all disciplines, including STEM.

7 (12) One in five children in the United States
8 attend school in a rural community. The data shows
9 that rural students are at a disadvantage with re-
10 spect to STEM readiness. Among STEM-interested
11 students, 17 percent of students in rural high
12 schools and 18 percent of students in town-located
13 high schools meet the ACT STEM Benchmark, com-
14 pared with 33 percent of students in suburban high
15 schools and 27 percent of students in urban high
16 schools.

17 (13) A substantial body of evidence establishes
18 that most people hold implicit biases. Decades of
19 cognitive psychology research reveal that most peo-
20 ple carry prejudices of which they are unaware but
21 that nonetheless play a large role in evaluations of
22 people and their work. Unintentional biases and out-
23 moded institutional structures are hindering the ac-
24 cess and advancement of women, minorities, and
25 other groups historically underrepresented in STEM.

1 (14) Workshops held to educate faculty about
2 unintentional biases have demonstrated success in
3 raising awareness of such biases.

4 (15) In 2012, the Office of Diversity and Equal
5 Opportunity of the National Aeronautics and Space
6 Administration (in this Act referred to as “NASA”)
7 completed a report that—

8 (A) is specifically designed to help NASA
9 grant recipients identify why the dearth of
10 women in STEM fields continues and to ensure
11 that it is not due to discrimination; and

12 (B) provides guidance that is usable by all
13 institutions of higher education receiving sig-
14 nificant Federal research funding on how to
15 conduct meaningful self-evaluations of campus
16 culture and policies.

17 (16) The Federal Government provides 55 per-
18 cent of research funding at institutions of higher
19 education and, through its grant-making policies,
20 has had significant influence on institution of higher
21 education policies, including policies related to insti-
22 tutional culture and structure.

23 **SEC. 2. PURPOSES.**

24 The purposes of this Act are as follows:

1 (1) To ensure that Federal science agencies and
2 institutions of higher education receiving Federal re-
3 search and development funding are fully engaging
4 the entire talent pool of the United States.

5 (2) To promote research on, and increase un-
6 derstanding of, the participation and trajectories of
7 women, minorities, and other groups historically
8 underrepresented in STEM studies and careers, in-
9 cluding persons with disabilities, older learners, vet-
10 erans, and rural, poor, and tribal populations, at in-
11 stitutions of higher education and Federal science
12 agencies, including Federal laboratories.

13 (3) To raise awareness within Federal science
14 agencies, including Federal laboratories, and institu-
15 tions of higher education about cultural and institu-
16 tional barriers limiting the recruitment, retention,
17 promotion, and other indicators of participation and
18 achievement of women, minorities, and other groups
19 historically underrepresented in academic and Gov-
20 ernment STEM research careers at all levels.

21 (4) To identify, disseminate, and implement
22 best practices at Federal science agencies, including
23 Federal laboratories, and at institutions of higher
24 education to remove or reduce cultural and institu-
25 tional barriers limiting the recruitment, retention,

1 and success of women, minorities, and other groups
2 historically underrepresented in academic and Gov-
3 ernment STEM research careers.

4 (5) To provide grants to institutions of higher
5 education to recruit, retain, and advance STEM fac-
6 ulty members from underrepresented minority
7 groups and to implement or expand reforms in un-
8 dergraduate STEM education in order to increase
9 the number of students from underrepresented mi-
10 nority groups receiving degrees in these fields.

11 **SEC. 3. FEDERAL SCIENCE AGENCY POLICIES FOR CARE-**
12 **GIVERS.**

13 (a) OSTP GUIDANCE.—Not later than 6 months
14 after the date of enactment of this Act, the Director, in
15 consultation with relevant agencies, shall provide guidance
16 to each Federal science agency to establish policies that—

17 (1) apply to all—

18 (A) research awards granted by such agen-
19 cy; and

20 (B) principal investigators of such research
21 who have caregiving responsibilities, including
22 care for a newborn or newly adopted child and
23 care for an immediate family member who is
24 sick or disabled; and

25 (2) provide—

1 (A) flexibility in timing for the initiation of
2 approved research awards granted by such
3 agency;

4 (B) no-cost extensions of such research
5 awards;

6 (C) grant supplements, as appropriate, to
7 research awards for research technicians or
8 equivalent positions to sustain research activi-
9 ties conducted under such awards; and

10 (D) any other appropriate accommodations
11 at the discretion of the director of each such
12 agency.

13 (b) UNIFORMITY OF GUIDANCE.—In providing guid-
14 ance under subsection (a), the Director shall encourage
15 uniformity and consistency in the policies established pur-
16 suant to such guidance across all Federal science agencies.

17 (c) ESTABLISHMENT OF POLICIES.—Consistent with
18 the guidance under subsection (a), Federal science agen-
19 cies shall—

20 (1) maintain or develop and implement policies
21 for individuals described in paragraph (1)(B) of
22 such subsection; and

23 (2) broadly disseminate such policies to current
24 and potential grantees.

1 (d) DATA ON USAGE.—Federal science agencies
2 shall—

3 (1) collect data on the usage of the policies
4 under subsection (c), by gender, at both institutions
5 of higher education and Federal laboratories; and

6 (2) report such data on an annual basis to the
7 Director in such form as required by the Director.

8 **SEC. 4. COLLECTION AND REPORTING OF DATA ON FED-**
9 **ERAL RESEARCH GRANTS.**

10 (a) COLLECTION OF DATA.—

11 (1) IN GENERAL.—Each Federal science agency
12 shall collect, as practicable, with respect to all appli-
13 cations for merit-reviewed research and development
14 grants to institutions of higher education and Fed-
15 eral laboratories supported by that agency, the
16 standardized record-level annual information on de-
17 mographics, primary field, award type, institution
18 type, review rating, budget request, funding out-
19 come, and awarded budget.

20 (2) UNIFORMITY AND STANDARDIZATION.—The
21 Director, in consultation with the Director of the
22 National Science Foundation, shall establish a policy
23 to ensure uniformity and standardization of the data
24 collection required under paragraph (1).

25 (3) RECORD-LEVEL DATA.—

1 (A) REQUIREMENT.—Beginning not later
2 than 2 years after the date of the enactment of
3 this Act, and on an annual basis thereafter,
4 each Federal science agency shall submit to the
5 Director of the National Science Foundation
6 record-level data collected under paragraph (1)
7 in the form required by such Director.

8 (B) PREVIOUS DATA.—As part of the first
9 submission under subparagraph (A), each Fed-
10 eral science agency, to the extent practicable,
11 shall also submit comparable record-level data
12 for the 5 years preceding the date of such sub-
13 mission.

14 (b) REPORTING OF DATA.—The Director of the Na-
15 tional Science Foundation shall publish statistical sum-
16 mary data, as practicable, collected under this section,
17 disaggregated and cross-tabulated by race, ethnicity, gen-
18 der, and years since completion of doctoral degree, includ-
19 ing in conjunction with the National Science Foundation’s
20 report required by section 37 of the Science and Engineer-
21 ing Equal Opportunities Act (42 U.S.C. 1885d).

22 **SEC. 5. POLICIES FOR REVIEW OF FEDERAL RESEARCH**
23 **GRANTS.**

24 (a) IN GENERAL.—Each Federal science agency shall
25 implement the policy recommendations with respect to re-

1 ducing the impact of implicit bias at Federal science agen-
2 cies and grantee institutions as developed by the Office
3 of Science and Technology Policy in the 2016 report enti-
4 tled “Reducing the Impact of Bias in the STEM Work-
5 force” and any subsequent updates.

6 (b) PILOT ACTIVITY.—In consultation with the Na-
7 tional Science Foundation and consistent with policy rec-
8 ommendations referenced in subsection (a), each Federal
9 science agency shall implement a 2-year pilot orientation
10 activity for program officers and members of standing re-
11 view committees to educate reviewers on research related
12 to, and minimize the effects of, implicit bias in the review
13 of extramural and intramural Federal research grants.

14 (c) ESTABLISHMENT OF POLICIES.—Drawing upon
15 lessons learned from the pilot activity under subsection
16 (b), each Federal science agency shall maintain or develop
17 and implement evidence-based policies and practices to
18 minimize the effects of implicit bias in the review of extra-
19 mural and intramural Federal research grants.

20 (d) ASSESSMENT OF POLICIES.—Federal science
21 agencies shall regularly assess, and amend as necessary,
22 the policies and practices implemented pursuant to sub-
23 section (c) to ensure effective measures are in place to
24 minimize the effects of implicit bias in the review of extra-
25 mural and intramural Federal research grants.

1 **SEC. 6. COLLECTION OF DATA ON DEMOGRAPHICS OF FAC-**
2 **ULTY.**

3 (a) COLLECTION OF DATA.—

4 (1) IN GENERAL.—Not later than 3 years after
5 the date of enactment of this Act, and at least every
6 5 years thereafter, the Director of the National
7 Science Foundation shall carry out a survey to col-
8 lect data from grantees on the demographics of
9 STEM faculty, by broad fields of STEM, at dif-
10 ferent types of institutions of higher education.

11 (2) CONSIDERATIONS.—To the extent prac-
12 ticable, the Director of the National Science Foun-
13 dation shall consider, by gender, race, ethnicity, citi-
14 zenship status, and years since completion of doc-
15 toral degree—

16 (A) the number and percentage of faculty;

17 (B) the number and percentage of faculty
18 at each rank;

19 (C) the number and percentage of faculty
20 who are in nontenure-track positions, including
21 teaching and research;

22 (D) the number and percentage of faculty
23 who are reviewed for promotion, including ten-
24 ure, and the percentage of that number who are
25 promoted, including being awarded tenure;

26 (E) faculty years in rank;

1 (F) the number and percentage of faculty
2 to leave tenure-track positions;

3 (G) the number and percentage of faculty
4 hired, by rank; and

5 (H) the number and percentage of faculty
6 in leadership positions.

7 (b) EXISTING SURVEYS.—The Director of the Na-
8 tional Science Foundation, may, in modifying or expand-
9 ing existing Federal surveys of higher education (as nec-
10 essary)—

11 (1) take into account the considerations under
12 subsection (a)(2) by collaborating with statistical
13 centers at other Federal agencies; or

14 (2) award a grant or contract to an institution
15 of higher education or other nonprofit organization
16 to take such considerations into account.

17 (c) REPORTING DATA.—The Director of the National
18 Science Foundation shall publish statistical summary data
19 collected under this section, including as part of the Na-
20 tional Science Foundation's report required by section 37
21 of the Science and Engineering Equal Opportunities Act
22 (42 U.S.C. 1885d).

23 (d) AUTHORIZATION OF APPROPRIATIONS.—There
24 are authorized to be appropriated to the Director of the
25 National Science Foundation \$3,000,000 in each of fiscal

1 years 2020 through 2022 to develop and carry out the
2 initial survey required under subsection (a).

3 **SEC. 7. CULTURAL AND INSTITUTIONAL BARRIERS TO EX-**
4 **PANDING THE ACADEMIC AND FEDERAL**
5 **STEM WORKFORCE.**

6 (a) BEST PRACTICES AT INSTITUTIONS OF HIGHER
7 EDUCATION AND FEDERAL LABORATORIES.—

8 (1) DEVELOPMENT OF GUIDANCE.—Not later
9 than 12 months after the date of enactment of this
10 Act, the Director, in consultation with the inter-
11 agency working group on inclusion in STEM, shall
12 develop written guidance for institutions of higher
13 education and Federal laboratories on the best prac-
14 tices for—

15 (A) conducting periodic climate surveys of
16 STEM departments and divisions, with a par-
17 ticular focus on identifying any cultural or in-
18 stitutional barriers to the recruitment, reten-
19 tion, or advancement of women, racial and eth-
20 nic minorities, and other groups historically
21 underrepresented in STEM studies and careers;
22 and

23 (B) providing educational opportunities, in-
24 cluding workshops as described in subsection
25 (b), for STEM faculty, research personnel, and

1 administrators to learn about current research
2 on implicit bias in recruitment, evaluation, and
3 promotion of undergraduate and graduate stu-
4 dents and research personnel.

5 (2) EXISTING GUIDANCE.—In developing the
6 guidance under paragraph (1), the Director shall
7 utilize guidance already developed by Federal science
8 agencies.

9 (3) DISSEMINATION OF GUIDANCE.—Federal
10 science agencies shall broadly disseminate the guid-
11 ance developed under paragraph (1) to institutions
12 of higher education that receive Federal research
13 funding and Federal laboratories.

14 (4) ESTABLISHMENT OF POLICIES.—Consistent
15 with the guidance developed under paragraph (1)—

16 (A) the Director of the National Science
17 Foundation shall develop a policy that—

18 (i) applies to, at a minimum, doctoral
19 degree granting institutions that receive
20 Federal research funding; and

21 (ii) requires each such institution, not
22 later than 3 years after the date of enact-
23 ment of this Act, to report to the Director
24 of the National Science Foundation on ac-
25 tivities and policies developed and imple-

1 mented based on the guidance developed
2 under paragraph (1); and

3 (B) each Federal science agency with a
4 Federal laboratory shall maintain or develop
5 and implement practices and policies for the
6 purposes described in paragraph (1) for such
7 laboratory.

8 (b) WORKSHOPS TO ADDRESS CULTURAL BARRIERS
9 TO EXPANDING THE ACADEMIC AND FEDERAL STEM
10 WORKFORCE.—

11 (1) IN GENERAL.—Not later than 6 months
12 after the date of enactment of this Act, the Director,
13 in consultation with the interagency working group
14 on inclusion in STEM, shall recommend a uniform
15 policy for Federal science agencies to carry out a
16 program of workshops that educate STEM depart-
17 ment chairs at institutions of higher education, sen-
18 ior managers at Federal laboratories, and other fed-
19 erally funded researchers about methods that mini-
20 mize the effects of implicit bias in the career ad-
21 vancement, including hiring, tenure, promotion, and
22 selection for any honor based in part on the recipi-
23 ent's research record, of academic and Federal
24 STEM researchers.

1 (2) INTERAGENCY COORDINATION.—The Direc-
2 tor shall, to the extent practicable, ensure that work-
3 shops supported under this subsection are coordi-
4 nated across Federal science agencies and jointly
5 supported as appropriate.

6 (3) MINIMIZING COSTS.—To the extent prac-
7 ticable, workshops shall be held in conjunction with
8 national or regional STEM disciplinary meetings to
9 minimize costs associated with participant travel.

10 (4) PRIORITY FIELDS FOR ACADEMIC PARTICI-
11 PANTS.—In considering the participation of STEM
12 department chairs and other academic researchers,
13 the Director shall prioritize workshops for the broad
14 fields of STEM in which the national rate of rep-
15 resentation of women among tenured or tenure-track
16 faculty or nonfaculty researchers at doctorate-grant-
17 ing institutions of higher education is less than 25
18 percent, according to the most recent data available
19 from the National Center for Science and Engineer-
20 ing Statistics.

21 (5) ORGANIZATIONS ELIGIBLE TO CARRY OUT
22 WORKSHOPS.—A Federal science agency may carry
23 out the program of workshops under this subsection
24 by making grants to organizations made eligible by

1 the Federal science agency and any of the following
2 organizations:

3 (A) Nonprofit scientific and professional
4 societies and organizations that represent one
5 or more STEM disciplines.

6 (B) Nonprofit organizations that have the
7 primary mission of advancing the participation
8 of women, minorities, or other groups histori-
9 cally underrepresented in STEM.

10 (6) CHARACTERISTICS OF WORKSHOPS.—The
11 workshops shall have the following characteristics:

12 (A) Invitees to workshops shall include at
13 least—

14 (i) the chairs of departments in the
15 relevant STEM discipline or disciplines
16 from doctoral degree granting institutions
17 that receive Federal research funding; and

18 (ii) in the case of Federal laboratories,
19 individuals with personnel management re-
20 sponsibilities comparable to those of an in-
21 stitution of higher education department
22 chair.

23 (B) Activities at the workshops shall in-
24 clude research presentations and interactive dis-
25 cussions or other activities that increase the

1 awareness of the existence of implicit bias in re-
2 cruitment, hiring, tenure review, promotion, and
3 other forms of formal recognition of individual
4 achievement for faculty and other federally
5 funded STEM researchers and shall provide
6 strategies to overcome such bias.

7 (C) Research presentations and other
8 workshop programs, as appropriate, shall in-
9 clude a discussion of the unique challenges
10 faced by different underrepresented groups, in-
11 cluding minority women, minority men, persons
12 from rural and underserved areas, persons with
13 disabilities, gender and sexual minority individ-
14 uals, and first generation graduates in research.

15 (D) Workshop programs shall include in-
16 formation on best practices for mentoring un-
17 dergraduate, graduate, and postdoctoral
18 women, minorities, and other students from
19 groups historically underrepresented in STEM.

20 (7) DATA ON WORKSHOPS.—Any proposal for
21 funding by an organization seeking to carry out a
22 workshop under this subsection shall include a de-
23 scription of how such organization will—

24 (A) collect data on the rates of attendance
25 by invitees in workshops, including information

1 on the home institution and department of
2 attendees, and the rank of faculty attendees;

3 (B) conduct attitudinal surveys on work-
4 shop attendees before and after the workshops;
5 and

6 (C) collect follow-up data on any relevant
7 institutional policy or practice changes reported
8 by attendees not later than one year after at-
9 tendance in such a workshop.

10 (8) REPORT TO NSF.—Organizations receiving
11 funding to carry out workshops under this sub-
12 section shall report the data required in paragraph
13 (7) to the Director of the National Science Founda-
14 tion in such form as required by such Director.

15 (c) REPORT TO CONGRESS.—Not later than 4 years
16 after the date of enactment of this Act, the Director of
17 the National Science Foundation shall submit a report to
18 Congress that includes—

19 (1) a summary and analysis of the types and
20 frequency of activities and policies developed and
21 carried out under subsection (a) based on the re-
22 ports submitted under paragraph (4) of such sub-
23 section; and

24 (2) a description and evaluation of the status
25 and effectiveness of the program of workshops re-

1 required under subsection (b), including a summary of
2 any data reported under paragraph (8) of such sub-
3 section.

4 (d) AUTHORIZATION OF APPROPRIATIONS.—There
5 are authorized to be appropriated to the Director of the
6 National Science Foundation \$1,000,000 in each of fiscal
7 years 2020 through 2024 to carry out this section.

8 **SEC. 8. RESEARCH AND DISSEMINATION AT THE NATIONAL**
9 **SCIENCE FOUNDATION.**

10 (a) IN GENERAL.—The Director of the National
11 Science Foundation shall award research grants and carry
12 out dissemination activities consistent with the purposes
13 of this Act, including—

14 (1) research grants to analyze the record-level
15 data collected under section 4 and section 6, con-
16 sistent with policies to ensure the privacy of individ-
17 uals identifiable by such data;

18 (2) research grants to study best practices for
19 work-life accommodation;

20 (3) research grants to study the impact of poli-
21 cies and practices that are implemented under this
22 Act or that are otherwise consistent with the pur-
23 poses of this Act;

24 (4) collaboration with other Federal science
25 agencies and professional associations to exchange

1 best practices, harmonize work-life accommodation
2 policies and practices, and overcome common bar-
3 riers to work-life accommodation; and

4 (5) collaboration with institutions of higher
5 education in order to clarify and catalyze the adop-
6 tion of a coherent and consistent set of work-life ac-
7 commodation policies and practices.

8 (b) AUTHORIZATION OF APPROPRIATIONS.—There
9 are authorized to be appropriated to the Director of the
10 National Science Foundation \$5,000,000 in each of fiscal
11 years 2020 through 2024 to carry out this section.

12 **SEC. 9. RESEARCH AND RELATED ACTIVITIES TO EXPAND**
13 **STEM OPPORTUNITIES.**

14 (a) NATIONAL SCIENCE FOUNDATION SUPPORT FOR
15 INCREASING DIVERSITY AMONG STEM FACULTY AT IN-
16 STITUTIONS OF HIGHER EDUCATION.—Section 305 of the
17 American Innovation and Competitiveness Act (42 U.S.C.
18 1862s–5) is amended—

19 (1) by redesignating subsections (e) and (f) as
20 subsections (g) and (h), respectively; and

21 (2) by inserting after subsection (d) the fol-
22 lowing:

23 “(e) SUPPORT FOR INCREASING DIVERSITY AMONG
24 STEM FACULTY AT INSTITUTIONS OF HIGHER EDU-
25 CATION.—

1 “(1) IN GENERAL.—The Director of the Foun-
2 dation shall award grants to institutions of higher
3 education (or consortia thereof) for the development
4 and assessment of innovative reform efforts designed
5 to increase the recruitment, retention, and advance-
6 ment of individuals from underrepresented minority
7 groups in academic STEM careers.

8 “(2) MERIT REVIEW; COMPETITION.—Grants
9 shall be awarded under this subsection on a merit-
10 reviewed, competitive basis.

11 “(3) USE OF FUNDS.—Activities supported by
12 grants under this subsection may include—

13 “(A) institutional assessment activities,
14 such as data analyses and policy review, in
15 order to identify and address specific issues in
16 the recruitment, retention, and advancement of
17 faculty members from underrepresented minor-
18 ity groups;

19 “(B) implementation of institution-wide
20 improvements in workload distribution, such
21 that faculty members from underrepresented
22 minority groups are not disadvantaged in the
23 amount of time available to focus on research,
24 publishing papers, and engaging in other activi-

1 ties required to achieve tenure status and run
2 a productive research program;

3 “(C) development and implementation of
4 training courses for administrators and search
5 committee members to ensure that candidates
6 from underrepresented minority groups are not
7 subject to implicit biases in the search and hir-
8 ing process;

9 “(D) development and hosting of intra- or
10 inter-institutional workshops to propagate best
11 practices in recruiting, retaining, and advancing
12 faculty members from underrepresented minor-
13 ity groups;

14 “(E) professional development opportuni-
15 ties for faculty members from underrepresented
16 minority groups;

17 “(F) activities aimed at making under-
18 graduate STEM students from underrep-
19 resented minority groups aware of opportunities
20 for academic careers in STEM fields;

21 “(G) activities to identify and engage ex-
22 ceptional graduate students and postdoctoral
23 researchers from underrepresented minority
24 groups at various stages of their studies and to
25 encourage them to enter academic careers; and

1 “(H) other activities consistent with para-
2 graph (1), as determined by the Director of the
3 Foundation.

4 “(4) SELECTION PROCESS.—

5 “(A) APPLICATION.—An institution of
6 higher education (or a consortium of such insti-
7 tutions) seeking funding under this subsection
8 shall submit an application to the Director of
9 the Foundation at such time, in such manner,
10 and containing such information and assur-
11 ances as such Director may require. The appli-
12 cation shall include, at a minimum, a descrip-
13 tion of—

14 “(i) the reform effort that is being
15 proposed for implementation by the insti-
16 tution of higher education;

17 “(ii) any available evidence of specific
18 difficulties in the recruitment, retention,
19 and advancement of faculty members from
20 underrepresented minority groups in
21 STEM academic careers within the institu-
22 tion of higher education submitting an ap-
23 plication, and how the proposed reform ef-
24 fort would address such issues;

1 “(iii) how the institution of higher
2 education submitting an application plans
3 to sustain the proposed reform effort be-
4 yond the duration of the grant; and

5 “(iv) how the success and effective-
6 ness of the proposed reform effort will be
7 evaluated and assessed in order to con-
8 tribute to the national knowledge base
9 about models for catalyzing institutional
10 change.

11 “(B) REVIEW OF APPLICATIONS.—In se-
12 lecting grant recipients under this subsection,
13 the Director of the Foundation shall consider,
14 at a minimum—

15 “(i) the likelihood of success in under-
16 taking the proposed reform effort at the
17 institution of higher education submitting
18 the application, including the extent to
19 which the administrators of the institution
20 are committed to making the proposed re-
21 form effort a priority;

22 “(ii) the degree to which the proposed
23 reform effort will contribute to change in
24 institutional culture and policy such that
25 greater value is placed on the recruitment,

1 retention, and advancement of faculty
2 members from underrepresented minority
3 groups;

4 “(iii) the likelihood that the institu-
5 tion of higher education will sustain or ex-
6 pand the proposed reform effort beyond
7 the period of the grant; and

8 “(iv) the degree to which evaluation
9 and assessment plans are included in the
10 design of the proposed reform effort.

11 “(C) GRANT DISTRIBUTION.—The Director
12 of the Foundation shall ensure, to the extent
13 practicable, that grants awarded under this sec-
14 tion are made to a variety of types of institu-
15 tions of higher education.

16 “(5) AUTHORIZATION OF APPROPRIATIONS.—
17 There are authorized to be appropriated to carry out
18 this subsection \$8,000,000 for each of fiscal years
19 2020 through 2024.”.

20 (b) NATIONAL SCIENCE FOUNDATION SUPPORT FOR
21 BROADENING PARTICIPATION IN UNDERGRADUATE
22 STEM EDUCATION.—Section 305 of the American Inno-
23 vation and Competitiveness Act (42 U.S.C. 1862s–5), as
24 amended by subsection (a), is further amended by insert-
25 ing after subsection (e) the following:

1 “(f) SUPPORT FOR BROADENING PARTICIPATION IN
2 UNDERGRADUATE STEM EDUCATION.—

3 “(1) IN GENERAL.—The Director of the Foun-
4 dation shall award grants to institutions of higher
5 education (or a consortium of such institutions) to
6 implement or expand research-based reforms in un-
7 dergraduate STEM education for the purpose of re-
8 cruiting and retaining students from minority
9 groups who are underrepresented in STEM fields.

10 “(2) MERIT REVIEW; COMPETITION.—Grants
11 shall be awarded under this subsection on a merit-
12 reviewed, competitive basis.

13 “(3) USE OF FUNDS.—Activities supported by
14 grants under this subsection may include—

15 “(A) implementation or expansion of inno-
16 vative, research-based approaches to broaden
17 participation of underrepresented minority
18 groups in STEM fields;

19 “(B) implementation or expansion of
20 bridge, cohort, tutoring, or mentoring pro-
21 grams, including those involving community col-
22 leges and technical schools, designed to enhance
23 the recruitment and retention of students from
24 underrepresented minority groups in STEM
25 fields;

1 “(C) implementation or expansion of out-
2 reach programs linking institutions of higher
3 education and K–12 school systems in order to
4 heighten awareness among pre-college students
5 from underrepresented minority groups of op-
6 portunities in college-level STEM fields and
7 STEM careers;

8 “(D) implementation or expansion of fac-
9 ulty development programs focused on improv-
10 ing retention of undergraduate STEM students
11 from underrepresented minority groups;

12 “(E) implementation or expansion of
13 mechanisms designed to recognize and reward
14 faculty members who demonstrate a commit-
15 ment to increasing the participation of students
16 from underrepresented minority groups in
17 STEM fields;

18 “(F) expansion of successful reforms
19 aimed at increasing the number of STEM stu-
20 dents from underrepresented minority groups
21 beyond a single course or group of courses to
22 achieve reform within an entire academic unit,
23 or expansion of successful reform efforts beyond
24 a single academic unit or field to other STEM

1 academic units or fields within an institution of
2 higher education;

3 “(G) expansion of opportunities for stu-
4 dents from underrepresented minority groups to
5 conduct STEM research in industry, at Federal
6 labs, and at international research institutions
7 or research sites;

8 “(H) provision of stipends for students
9 from underrepresented minority groups partici-
10 pating in research;

11 “(I) development of research collaborations
12 between research-intensive universities and pri-
13 marily undergraduate minority-serving institu-
14 tions;

15 “(J) support for graduate students and
16 postdoctoral fellows from underrepresented mi-
17 nority groups to participate in instructional or
18 assessment activities at primarily under-
19 graduate institutions, including primarily un-
20 dergraduate minority-serving institutions and
21 two-year institutions of higher education; and

22 “(K) other activities consistent with para-
23 graph (1), as determined by the Director of the
24 Foundation.

25 “(4) SELECTION PROCESS.—

1 “(A) APPLICATION.—An institution of
2 higher education (or a consortium thereof)
3 seeking a grant under this subsection shall sub-
4 mit an application to the Director of the Foun-
5 dation at such time, in such manner, and con-
6 taining such information and assurances as
7 such Director may require. The application
8 shall include, at a minimum—

9 “(i) a description of the proposed re-
10 form effort;

11 “(ii) a description of the research
12 findings that will serve as the basis for the
13 proposed reform effort or, in the case of
14 applications that propose an expansion of a
15 previously implemented reform, a descrip-
16 tion of the previously implemented reform
17 effort, including data about the recruit-
18 ment, retention, and academic achievement
19 of students from underrepresented minor-
20 ity groups;

21 “(iii) evidence of an institutional com-
22 mitment to, and support for, the proposed
23 reform effort, including a long-term com-
24 mitment to implement successful strategies
25 from the current reform beyond the aca-

1 demic unit or units included in the grant
2 proposal;

3 “(iv) a description of existing or
4 planned institutional policies and practices
5 regarding faculty hiring, promotion, ten-
6 ure, and teaching assignment that reward
7 faculty contributions to improving the edu-
8 cation of students from underrepresented
9 minority groups in STEM; and

10 “(v) how the success and effectiveness
11 of the proposed reform effort will be evalu-
12 ated and assessed in order to contribute to
13 the national knowledge base about models
14 for catalyzing institutional change.

15 “(B) REVIEW OF APPLICATIONS.—In se-
16 lecting grant recipients under this subsection,
17 the Director of the Foundation shall consider,
18 at a minimum—

19 “(i) the likelihood of success of the
20 proposed reform effort at the institution
21 submitting the application, including the
22 extent to which the faculty, staff, and ad-
23 ministrators of the institution are com-
24 mitted to making the proposed institu-

1 tional reform a priority of the participating
2 academic unit or units;

3 “(ii) the degree to which the proposed
4 reform effort will contribute to change in
5 institutional culture and policy such that
6 greater value is placed on faculty engage-
7 ment in the retention of students from
8 underrepresented minority groups;

9 “(iii) the likelihood that the institu-
10 tion will sustain or expand the proposed
11 reform effort beyond the period of the
12 grant; and

13 “(iv) the degree to which evaluation
14 and assessment plans are included in the
15 design of the proposed reform effort.

16 “(C) GRANT DISTRIBUTION.—The Director
17 of the Foundation shall ensure, to the extent
18 practicable, that grants awarded under this
19 subsection are made to a variety of types of in-
20 stitutions of higher education, including two-
21 year and minority-serving institutions of higher
22 education.

23 “(5) EDUCATION RESEARCH.—

24 “(A) IN GENERAL.—All grants made under
25 this subsection shall include an education re-

1 search component that will support the design
2 and implementation of a system for data collec-
3 tion and evaluation of proposed reform efforts
4 in order to build the knowledge base on prom-
5 ising models for increasing recruitment and re-
6 tention of students from underrepresented mi-
7 nority groups in STEM education at the under-
8 graduate level across a diverse set of institu-
9 tions.

10 “(B) DISSEMINATION.—The Director of
11 the Foundation shall coordinate with relevant
12 Federal agencies in disseminating the results of
13 the research under this paragraph to ensure
14 that best practices in broadening participation
15 in STEM education at the undergraduate level
16 are made readily available to all institutions of
17 higher education, other Federal agencies that
18 support STEM programs, non-Federal funders
19 of STEM education, and the general public.

20 “(6) AUTHORIZATION OF APPROPRIATIONS.—
21 There are authorized to be appropriated to carry out
22 this subsection \$15,000,000 for each of fiscal years
23 2020 through 2024.”.

1 **SEC. 10. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.**

2 (a) GRANTS TO BROADEN TRIBAL COLLEGE AND
3 UNIVERSITY STUDENT PARTICIPATION IN COMPUTER
4 SCIENCE.—Section 525 of the America COMPETES Re-
5 authorization Act of 2010 (42 U.S.C. 1862p–13) is
6 amended by inserting after subsection (c) the following:

7 “(d) GRANTS TO BROADEN TRIBAL COLLEGE AND
8 UNIVERSITY STUDENT PARTICIPATION IN COMPUTER
9 SCIENCE.—

10 “(1) IN GENERAL.—The Director, as part of
11 the program authorized under this section, shall
12 award grants on a competitive, merit-reviewed basis
13 to eligible entities to increase the participation of
14 tribal populations in computer science and computa-
15 tional thinking education programs to enable stu-
16 dents to develop skills and competencies in coding,
17 problem-solving, critical thinking, creativity and col-
18 laboration.

19 “(2) PURPOSE.—Grants awarded under this
20 subsection shall support—

21 “(A) research and development needed to
22 bring computer science and computational
23 thinking courses and degrees to tribal colleges
24 and universities;

25 “(B) research and development of instruc-
26 tional materials needed to integrate computer

1 science and computational thinking into pro-
2 grams that are culturally relevant to students
3 attending tribal colleges and universities;

4 “(C) research, development, and evaluation
5 of distance education for computer science and
6 computational thinking courses and degree pro-
7 grams for students attending tribal colleges and
8 universities; and

9 “(D) other activities consistent with the
10 activities described in paragraphs (1) through
11 (4) of subsection (b), as determined by the Di-
12 rector.

13 “(3) PARTNERSHIPS.—A tribal college or uni-
14 versity seeking a grant under this subsection, or a
15 consortia thereof, may partner with an institution of
16 higher education or nonprofit organization with dem-
17 onstrated expertise in academic program develop-
18 ment.

19 “(4) COORDINATION.—In carrying out this sub-
20 section, the Director shall consult and cooperate
21 with the programs and policies of other relevant
22 Federal agencies to avoid duplication with and en-
23 hance the effectiveness of the program under this
24 subsection.

1 “(5) AUTHORIZATION OF APPROPRIATIONS.—
2 There are authorized to be appropriated to the Di-
3 rector of the Foundation \$2,000,000 in each of fis-
4 cal years 2020 through 2024 to carry out this sub-
5 section.”.

6 (b) EVALUATION.—

7 (1) IN GENERAL.—Not later than 2 years after
8 the date of enactment of this Act, the Director of
9 the National Science Foundation shall evaluate the
10 grant program authorized under section 525 of the
11 America COMPETES Reauthorization Act of 2010
12 (42 U.S.C. 1862p–13), as amended by subsection
13 (a).

14 (2) REQUIREMENTS.—In conducting the evalua-
15 tion under paragraph (1), the Director of the Na-
16 tional Science Foundation shall, as practicable—

17 (A) use a common set of benchmarks and
18 assessment tools to identify best practices and
19 materials developed or demonstrated by the re-
20 search conducted pursuant to grants programs
21 under section 525 of the America COMPETES
22 Reauthorization Act of 2010 (42 U.S.C.
23 1862p–13);

24 (B) include an assessment of the effective-
25 ness of such grant programs in expanding ac-

1 cess to high quality STEM education, research,
2 and outreach at tribal colleges and universities,
3 as applicable;

4 (C) assess the number of students who
5 participated in such grant programs; and

6 (D) assess the percentage of students par-
7 ticipating in such grant programs who success-
8 fully complete their education programs.

9 (3) REPORT.—Not later than 180 days after
10 the date on which the evaluation under paragraph
11 (1) is completed, the Director of the National
12 Science Foundation shall submit to Congress and
13 make available to the public, a report on the results
14 of the evaluation, including any recommendations for
15 legislative action that could optimize the effective-
16 ness of the grant program authorized under section
17 525 of the America COMPETES Reauthorization
18 Act of 2010, as amended by subsection (a).

19 **SEC. 11. REPORT TO CONGRESS.**

20 Not later than 4 years after the date of enactment
21 of this Act, the Director shall submit a report to Congress
22 that includes—

23 (1) a description and evaluation of the status
24 and usage of policies implemented pursuant to sec-
25 tion 3 at all Federal science agencies, including any

1 recommendations for revising or expanding such
2 policies;

3 (2) with respect to efforts to minimize the ef-
4 fects of implicit bias in the review of extramural and
5 intramural Federal research grants under section
6 5—

7 (A) what steps all Federal science agencies
8 have taken to implement policies and practices
9 to minimize such effects;

10 (B) a description of any significant up-
11 dates to the policies for review of Federal re-
12 search grants required under such section; and

13 (C) any evidence of the impact of such
14 policies on the review or awarding of Federal
15 research grants; and

16 (3) a description and evaluation of the status of
17 institution of higher education and Federal labora-
18 tory policies and practices required under section
19 7(a), including any recommendations for revising or
20 expanding such policies.

21 **SEC. 12. MERIT REVIEW.**

22 Nothing in this Act shall be construed as altering any
23 intellectual or broader impacts criteria at Federal science
24 agencies for evaluating grant applications.

1 **SEC. 13. DEFINITIONS.**

2 In this Act:

3 (1) DIRECTOR.—The term “Director” means
4 the Director of the Office of Science and Technology
5 Policy.

6 (2) FEDERAL LABORATORY.—The term “Fed-
7 eral laboratory” has the meaning given such term in
8 section 4 of the Stevenson-Wydler Technology Inno-
9 vation Act of 1980 (15 U.S.C. 3703).

10 (3) FEDERAL SCIENCE AGENCY.—The term
11 “Federal science agency” means any Federal agency
12 with at least \$100,000,000 in research and develop-
13 ment expenditures in fiscal year 2018.

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

18 (5) INTERAGENCY WORKING GROUP ON INCLU-
19 SION IN STEM.—The term “interagency working
20 group on inclusion in STEM” means the interagency
21 working group established by section 308 of the
22 American Innovation and Competitiveness Act (42
23 U.S.C. 6626).

- 1 (6) STEM.—The term “STEM” means science,
- 2 technology, engineering, and mathematics, including
- 3 computer science.

○