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REPORT
116–184

STEM OPPORTUNITIES ACT OF 2019

JULY 30, 2019.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Ms. JOHNSON of Texas, from the Committee on Science, Space, and Technology, submitted the following

R E P O R T

[To accompany H.R. 2528]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 2528) 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, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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89–006

The amendment is as follows:
Strike all after the enacting clause and insert the following:

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

(a) SHORT TITLE.—This Act may be cited as the "STEM Opportunities Act of 2019".

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

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

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

(2) Research shows that women and minorities who are interested in STEM careers are disproportionately lost at nearly every educational transition and at every career milestone.

(3) The National Center for Science and Engineering Statistics at the National Science Foundation collects, compiles, analyzes, and publishes data on the demographics of STEM degrees and STEM jobs in the United States.

(4) Women now earn nearly 37 percent of all STEM bachelor's degrees, but major variations persist among fields. In 2017, women earned only 20 percent of all bachelor's degrees awarded in engineering and 19 percent of bachelor's degrees awarded in computer sciences. Based on Bureau of Labor Statistics data, jobs in computing occupations are expected to account for nearly 60 percent of the projected annual growth of newly created STEM job openings from 2016 to 2026.

(5) In 2017, underrepresented minority groups comprised 39 percent of the college-age population of the United States, but only 18 percent of students who earned bachelor's degrees in STEM fields. The Higher Education Research Institute at the University of California, Los Angeles, found that, while freshmen from underrepresented minority groups express an interest in pursuing a STEM undergraduate degree at the same rate as all other freshmen, only 22.1 percent of Latino students, 18.4 percent of African-American students, and 18.8 percent of Native American students studying in STEM fields complete their degree within 5 years, compared to approximately 33 percent of White students and 42 percent of Asian students who complete their degree within 5 years.

(6) In some STEM fields, including the computer sciences, women persist at about the same rate through doctorate degrees. In other STEM fields, women persist through doctorate degrees at a lower rate. In mathematics, women earn just 26 percent of doctorate degrees compared with 42 percent of undergraduate degrees. Overall, women earned 38 percent of STEM doctorate degrees in 2016. The rate of minority students earning STEM doctorate degrees in physics is 9 percent, compared with 15 percent for bachelor's degree. Students from underrepresented minority groups accounted for only 11.5 percent of STEM doctorate degrees awarded in 2016.

(7) The representation of women in STEM drops significantly from the doctorate degree level to the faculty level. Overall, women hold only 26 percent of all tenured and tenure-track positions and 27 percent of full professor positions in STEM fields in our Nation's universities and 4-year colleges. Black and Hispanic faculty together hold about 6.8 percent of all tenured and tenure-track positions and 7.5 percent of full professor positions. Many of the numbers in the American Indian or Alaskan Native and Native Hawaiian or Other Pacific Islander categories for different faculty ranks were too small for the National Science Foundation to report publicly without potentially compromising confidential information about the individuals being surveyed.

(8) The representation of women is especially low at our Nation's top research universities. Even in the biological sciences, in which women now earn more than 50 percent of the doctorates and passed the 25 percent level 37 years ago, women make up only 25 percent of the full professors at the approximately 100 most research-intensive universities in the United States. In the physical

sciences and mathematics, women make up only 11 percent of full professors, in computer sciences only 10 percent, and across engineering fields only 7 percent. The data suggest that approximately 6 percent of all tenure-track STEM faculty members at the most research-intensive universities are from underrepresented minority groups, but in some fields the numbers are too small to report publicly.

(9) By 2050, underrepresented minorities will comprise 52 percent of the college-age population of the United States. If the percentage of female students and students from underrepresented minority groups earning bachelor's degrees in STEM fields does not significantly increase, the United States will face an acute shortfall in the overall number of students who earn degrees in STEM fields just as United States companies are increasingly seeking students with those skills. With this impending shortfall, the United States will almost certainly lose its competitive edge in the 21st century global economy.

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

(11) Female students and students from underrepresented minority groups at institutions of higher education who see few others "like themselves" among faculty and student populations often do not experience the social integration that is necessary for success in all disciplines, including STEM.

(12) One in five children in the United States attend school in a rural community. The data shows that rural students are at a disadvantage with respect to STEM readiness. Among STEM-interested students, 17 percent of students in rural high schools and 18 percent of students in town-located high schools meet the ACT STEM Benchmark, compared with 33 percent of students in suburban high schools and 27 percent of students in urban high schools.

(13) A substantial body of evidence establishes that most people hold implicit biases. Decades of cognitive psychology research reveal that most people carry prejudices of which they are unaware but that nonetheless play a large role in evaluations of people and their work. Unintentional biases and outmoded institutional structures are hindering the access and advancement of women, minorities, and other groups historically underrepresented in STEM.

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

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

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

(B) provides guidance that is usable by all institutions of higher education receiving significant Federal research funding on how to conduct meaningful self-evaluations of campus culture and policies.

(16) The Federal Government provides 55 percent of research funding at institutions of higher education and, through its grant-making policies, has had significant influence on institution of higher education policies, including policies related to institutional culture and structure.

SEC. 2. PURPOSES.

The purposes of this Act are as follows:

(1) To ensure that Federal science agencies and institutions of higher education receiving Federal research and development funding are fully engaging the entire talent pool of the United States.

(2) To promote research on, and increase understanding of, the participation and trajectories of women, minorities, and other groups historically underrepresented in STEM studies and careers, including persons with disabilities, older learners, veterans, and rural, poor, and tribal populations, at institutions of higher education and Federal science agencies, including Federal laboratories.

(3) To raise awareness within Federal science agencies, including Federal laboratories, and institutions of higher education about cultural and institutional barriers limiting the recruitment, retention, promotion, and other indicators of participation and achievement of women, minorities, and other groups histori-

cally underrepresented in academic and Government STEM research careers at all levels.

(4) To identify, disseminate, and implement best practices at Federal science agencies, including Federal laboratories, and at institutions of higher education to remove or reduce cultural and institutional barriers limiting the recruitment, retention, and success of women, minorities, and other groups historically underrepresented in academic and Government STEM research careers.

(5) To provide grants to institutions of higher education to recruit, retain, and advance STEM faculty members from underrepresented minority groups and to implement or expand reforms in undergraduate STEM education in order to increase the number of students from underrepresented minority groups receiving degrees in these fields.

SEC. 3. FEDERAL SCIENCE AGENCY POLICIES FOR CAREGIVERS.

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

(1) apply to all—

(A) research awards granted by such agency; and

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

(2) provide—

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

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

(C) grant supplements, as appropriate, to research awards for research technicians or equivalent positions to sustain research activities conducted under such awards; and

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

(b) UNIFORMITY OF GUIDANCE.—In providing guidance under subsection (a), the Director shall encourage uniformity and consistency in the policies established pursuant to such guidance across all Federal science agencies.

(c) ESTABLISHMENT OF POLICIES.—Consistent with the guidance under subsection (a), Federal science agencies shall—

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

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

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

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

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

SEC. 4. COLLECTION AND REPORTING OF DATA ON FEDERAL RESEARCH GRANTS.

(a) COLLECTION OF DATA.—

(1) IN GENERAL.—Each Federal science agency shall collect, as practicable, with respect to all applications for merit-reviewed research and development grants to institutions of higher education and Federal laboratories supported by that agency, the standardized record-level annual information on demographics, primary field, award type, institution type, review rating, budget request, funding outcome, and awarded budget.

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

(3) RECORD-LEVEL DATA.—

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

(B) PREVIOUS DATA.—As part of the first submission under subparagraph (A), each Federal science agency, to the extent practicable, shall also submit comparable record-level data for the 5 years preceding the date of such submission.

(b) REPORTING OF DATA.—The Director of the National Science Foundation shall publish statistical summary data, as practicable, collected under this section, disaggregated and cross-tabulated by race, ethnicity, gender, and years since com-

pletion of doctoral degree, including in conjunction with the National Science Foundation's report required by section 37 of the Science and Technology Equal Opportunities Act (42 U.S.C. 1885d; Public Law 96–516).

SEC. 5. POLICIES FOR REVIEW OF FEDERAL RESEARCH GRANTS.

(a) IN GENERAL.—Each Federal science agency shall implement the policy recommendations with respect to reducing the impact of implicit bias at Federal science agencies and grantee institutions as developed by the Office of Science and Technology Policy in the 2016 report entitled "Reducing the Impact of Bias in the STEM Workforce" and any subsequent updates.

(b) PILOT ACTIVITY.—In consultation with the National Science Foundation and consistent with policy recommendations referenced in subsection (a), each Federal science agency shall implement a 2-year pilot orientation activity for program officers and members of standing review committees to educate reviewers on research related to, and minimize the effects of, implicit bias in the review of extramural and intramural Federal research grants.

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

(d) ASSESSMENT OF POLICIES.—Federal science agencies shall regularly assess, and amend as necessary, the policies and practices implemented pursuant to subsection (c) to ensure effective measures are in place to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants.

SEC. 6. COLLECTION OF DATA ON DEMOGRAPHICS OF FACULTY.

(a) COLLECTION OF DATA.—

(1) IN GENERAL.—Not later than 3 years after the date of enactment of this Act, and at least every 5 years thereafter, the Director of the National Science Foundation shall carry out a survey to collect data from grantees on the demographics of STEM faculty, by broad fields of STEM, at different types of institutions of higher education.

(2) CONSIDERATIONS.—To the extent practicable, the Director of the National Science Foundation shall consider, by gender, race, ethnicity, citizenship status, and years since completion of doctoral degree—

(A) the number and percentage of faculty;

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

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

(D) the number and percentage of faculty who are reviewed for promotion, including tenure, and the percentage of that number who are promoted, including being awarded tenure;

(E) faculty years in rank;

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

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

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

(b) EXISTING SURVEYS.—The Director of the National Science Foundation, may, in modifying or expanding existing Federal surveys of higher education (as necessary)—

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

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

(c) REPORTING DATA.—The Director of the National Science Foundation shall publish statistical summary data collected under this section, including as part of the National Science Foundation's report required by section 37 of the Science and Technology Equal Opportunities Act (42 U.S.C. 1885d; Public Law 96–516).

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation $3,000,000 in each of fiscal years 2020 through 2022 to develop and carry out the initial survey required under subsection (a).

SEC. 7. CULTURAL AND INSTITUTIONAL BARRIERS TO EXPANDING THE ACADEMIC AND FEDERAL STEM WORKFORCE.

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

(1) DEVELOPMENT OF GUIDANCE.—Not later than 12 months after the date of enactment of this Act, the Director, in consultation with the interagency working group on inclusion in STEM, shall develop written guidance for institutions of higher education and Federal laboratories on the best practices for—

(A) conducting periodic climate surveys of STEM departments and divisions, with a particular focus on identifying any cultural or institutional barriers to the recruitment, retention, or advancement of women, racial and ethnic minorities, and other groups historically underrepresented in STEM studies and careers; and

(B) providing educational opportunities, including workshops as described in subsection (b), for STEM faculty, research personnel, and administrators to learn about current research on implicit bias in recruitment, evaluation, and promotion of undergraduate and graduate students and research personnel.

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

(3) DISSEMINATION OF GUIDANCE.—Federal science agencies shall broadly disseminate the guidance developed under paragraph (1) to institutions of higher education that receive Federal research funding and Federal laboratories.

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

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

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

(ii) requires each such institution, not later than 3 years after the date of enactment of this Act, to report to the Director of the National Science Foundation on activities and policies developed and implemented based on the guidance developed under paragraph (1); and

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

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

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Director, in consultation with the interagency working group on inclusion in STEM, shall recommend a uniform policy for Federal science agencies to carry out a program of workshops that educate STEM department chairs at institutions of higher education, senior managers at Federal laboratories, and other federally funded researchers about methods that minimize the effects of implicit bias in the career advancement, including hiring, tenure, promotion, and selection for any honor based in part on the recipient's research record, of academic and Federal STEM researchers.

(2) INTERAGENCY COORDINATION.—The Director shall, to the extent practicable, ensure that workshops supported under this subsection are coordinated across Federal science agencies and jointly supported as appropriate.

(3) MINIMIZING COSTS.—To the extent practicable, workshops shall be held in conjunction with national or regional STEM disciplinary meetings to minimize costs associated with participant travel.

(4) PRIORITY FIELDS FOR ACADEMIC PARTICIPANTS.—In considering the participation of STEM department chairs and other academic researchers, the Director shall prioritize workshops for the broad fields of STEM in which the national rate of representation of women among tenured or tenure-track faculty or nonfaculty researchers at doctorate-granting institutions of higher education is less than 25 percent, according to the most recent data available from the National Center for Science and Engineering Statistics.

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

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

(B) Nonprofit organizations that have the primary mission of advancing the participation of women, minorities, or other groups historically underrepresented in STEM.

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

(A) Invitees to workshops shall include at least—

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

(ii) in the case of Federal laboratories, individuals with personnel management responsibilities comparable to those of an institution of higher education department chair.

(B) Activities at the workshops shall include research presentations and interactive discussions or other activities that increase the awareness of the existence of implicit bias in recruitment, hiring, tenure review, promotion, and other forms of formal recognition of individual achievement for faculty and other federally funded STEM researchers and shall provide strategies to overcome such bias.

(C) Research presentations and other workshop programs, as appropriate, shall include a discussion of the unique challenges faced by different underrepresented groups, including minority women, minority men, persons from rural and underserved areas, persons with disabilities, gender and sexual minority individuals, and first generation graduates in research.

(D) Workshop programs shall include information on best practices for mentoring undergraduate, graduate, and postdoctoral women, minorities, and other students from groups historically underrepresented in STEM.

(7) DATA ON WORKSHOPS.—Any proposal for funding by an organization seeking to carry out a workshop under this subsection shall include a description of how such organization will—

(A) collect data on the rates of attendance by invitees in workshops, including information on the home institution and department of attendees, and the rank of faculty attendees;

(B) conduct attitudinal surveys on workshop attendees before and after the workshops; and

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

(8) REPORT TO NSF.—Organizations receiving funding to carry out workshops under this subsection shall report the data required in paragraph (7) to the Director of the National Science Foundation in such form as required by such Director.

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

(1) a summary and analysis of the types and frequency of activities and policies developed and carried out under subsection (a) based on the reports submitted under paragraph (4) of such subsection; and

(2) a description and evaluation of the status and effectiveness of the program of workshops required under subsection (b), including a summary of any data reported under paragraph (8) of such subsection.

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

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

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

(1) research grants to analyze the record-level data collected under section 4 and section 6, consistent with policies to ensure the privacy of individuals identifiable by such data;

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

(3) research grants to study the impact of policies and practices that are implemented under this Act or that are otherwise consistent with the purposes of this Act;

(4) collaboration with other Federal science agencies and professional associations to exchange best practices, harmonize work-life accommodation policies and practices, and overcome common barriers to work-life accommodation; and

(5) collaboration with institutions of higher education in order to clarify and catalyze the adoption of a coherent and consistent set of work-life accommodation policies and practices.

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

SEC. 9. RESEARCH AND RELATED ACTIVITIES TO EXPAND STEM OPPORTUNITIES.

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

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

(2) by inserting after subsection (d) the following:

"(e) SUPPORT FOR INCREASING DIVERSITY AMONG STEM FACULTY AT INSTITUTIONS OF HIGHER EDUCATION.—

"(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or consortia thereof) for the development and assessment of innovative reform efforts designed to increase the recruitment, retention, and advancement of individuals from underrepresented minority groups in academic STEM careers.

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

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

"(A) institutional assessment activities, such as data analyses and policy review, in order to identify and address specific issues in the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

"(B) implementation of institution-wide improvements in workload distribution, such that faculty members from underrepresented minority groups are not disadvantaged in the amount of time available to focus on research, publishing papers, and engaging in other activities required to achieve tenure status and run a productive research program;

"(C) development and implementation of training courses for administrators and search committee members to ensure that candidates from underrepresented minority groups are not subject to implicit biases in the search and hiring process;

"(D) development and hosting of intra- or inter-institutional workshops to propagate best practices in recruiting, retaining, and advancing faculty members from underrepresented minority groups;

"(E) professional development opportunities for faculty members from underrepresented minority groups;

"(F) activities aimed at making undergraduate STEM students from underrepresented minority groups aware of opportunities for academic careers in STEM fields;

"(G) activities to identify and engage exceptional graduate students and postdoctoral researchers from underrepresented minority groups at various stages of their studies and to encourage them to enter academic careers; and

"(H) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

"(4) SELECTION PROCESS.—

"(A) APPLICATION.—An institution of higher education (or a consortium of such institutions) seeking funding under this subsection shall submit an application to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum, a description of—

"(i) the reform effort that is being proposed for implementation by the institution of higher education;

"(ii) any available evidence of specific difficulties in the recruitment, retention, and advancement of faculty members from underrepresented minority groups in STEM academic careers within the institution of higher education submitting an application, and how the proposed reform effort would address such issues;

"(iii) how the institution of higher education submitting an application plans to sustain the proposed reform effort beyond the duration of the grant; and

"(iv) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to the national knowledge base about models for catalyzing institutional change.

"(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection, the Director of the Foundation shall consider, at a minimum—

"(i) the likelihood of success in undertaking the proposed reform effort at the institution of higher education submitting the application, including the extent to which the administrators of the institution are committed to making the proposed reform effort a priority;

"(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is

placed on the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

"(iii) the likelihood that the institution of higher education will sustain or expand the proposed reform effort beyond the period of the grant; and

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

"(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent practicable, that grants awarded under this section are made to a variety of types of institutions of higher education.

"(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this subsection $8,000,000 for each of fiscal years 2020 through 2024.".

(b) NATIONAL SCIENCE FOUNDATION SUPPORT FOR BROADENING PARTICIPATION IN UNDERGRADUATE STEM EDUCATION.—Section 305 of the American Innovation and Competitiveness Act (42 U.S.C. 1862s–5), as amended by subsection (b), is further amended by inserting after subsection (e) the following:

"(f) SUPPORT FOR BROADENING PARTICIPATION IN UNDERGRADUATE STEM EDUCATION.—

"(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or a consortium of such institutions) to implement or expand research-based reforms in undergraduate STEM education for the purpose of recruiting and retaining students from minority groups who are underrepresented in STEM fields.

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

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

"(A) implementation or expansion of innovative, research-based approaches to broaden participation of underrepresented minority groups in STEM fields;

"(B) implementation or expansion of bridge, cohort, tutoring, or mentoring programs, including those involving community colleges and technical schools, designed to enhance the recruitment and retention of students from underrepresented minority groups in STEM fields;

"(C) implementation or expansion of outreach programs linking institutions of higher education and K–12 school systems in order to heighten awareness among pre-college students from underrepresented minority groups of opportunities in college-level STEM fields and STEM careers;

"(D) implementation or expansion of faculty development programs focused on improving retention of undergraduate STEM students from underrepresented minority groups;

"(E) implementation or expansion of mechanisms designed to recognize and reward faculty members who demonstrate a commitment to increasing the participation of students from underrepresented minority groups in STEM fields;

"(F) expansion of successful reforms aimed at increasing the number of STEM students from underrepresented minority groups beyond a single course or group of courses to achieve reform within an entire academic unit, or expansion of successful reform efforts beyond a single academic unit or field to other STEM academic units or fields within an institution of higher education;

"(G) expansion of opportunities for students from underrepresented minority groups to conduct STEM research in industry, at Federal labs, and at international research institutions or research sites;

"(H) provision of stipends for students from underrepresented minority groups participating in research;

"(I) development of research collaborations between research-intensive universities and primarily undergraduate minority-serving institutions;

"(J) support for graduate students and postdoctoral fellows from underrepresented minority groups to participate in instructional or assessment activities at primarily undergraduate institutions, including primarily undergraduate minority-serving institutions and two-year institutions of higher education; and

"(K) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

"(4) SELECTION PROCESS.—

"(A) APPLICATION.—An institution of higher education (or a consortia thereof) seeking a grant under this subsection shall submit an application

to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum—

"(i) a description of the proposed reform effort;

"(ii) a description of the research findings that will serve as the basis for the proposed reform effort or, in the case of applications that propose an expansion of a previously implemented reform, a description of the previously implemented reform effort, including data about the recruitment, retention, and academic achievement of students from underrepresented minority groups;

"(iii) evidence of an institutional commitment to, and support for, the proposed reform effort, including a long-term commitment to implement successful strategies from the current reform beyond the academic unit or units included in the grant proposal;

"(iv) a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching assignment that reward faculty contributions to improving the education of students from underrepresented minority groups in STEM; and

"(v) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to the national knowledge base about models for catalyzing institutional change.

"(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection, the Director of the Foundation shall consider, at a minimum—

"(i) the likelihood of success of the proposed reform effort at the institution submitting the application, including the extent to which the faculty, staff, and administrators of the institution are committed to making the proposed institutional reform a priority of the participating academic unit or units;

"(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is placed on faculty engagement in the retention of students from underrepresented minority groups;

"(iii) the likelihood that the institution will sustain or expand the proposed reform effort beyond the period of the grant; and

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

"(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent practicable, that grants awarded under this subsection are made to a variety of types of institutions of higher education, including two-year and minority-serving institutions of higher education.

"(5) EDUCATION RESEARCH.—

"(A) IN GENERAL.—All grants made under this subsection shall include an education research component that will support the design and implementation of a system for data collection and evaluation of proposed reform efforts in order to build the knowledge base on promising models for increasing recruitment and retention of students from underrepresented minority groups in STEM education at the undergraduate level across a diverse set of institutions.

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

"(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this subsection $15,000,000 for each of fiscal years 2020 through 2024.".

SEC. 10. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.

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

"(d) GRANTS TO BROADEN TRIBAL COLLEGE AND UNIVERSITY STUDENT PARTICIPATION IN COMPUTER SCIENCE.—

"(1) IN GENERAL.—The Director, as part of the program authorized under this section, shall award grants on a competitive, merit-reviewed basis to eligible entities to increase the participation of tribal populations in computer science and

computational thinking education programs to enable students to develop skills and competencies in coding, problem-solving, critical thinking, creativity and collaboration.

"(2) PURPOSE.—Grants awarded under this subsection shall support—

"(A) research and development needed to bring computer science and computational thinking courses and degrees to tribal colleges and universities;

"(B) research and development of instructional materials needed to integrate computer science and computational thinking into programs that are culturally relevant to students attending tribal colleges and universities;

"(C) research, development and evaluation of distance education for computer science and computational thinking courses and degree programs for students attending tribal colleges and universities; and

"(D) other activities consistent with the activities described in paragraphs (1) through (4) of subsection (b), as determined by the Director.

"(3) PARTNERSHIPS.—A tribal college or university seeking a grant under this subsection, or a consortia thereof, may partner with an institution of higher education or nonprofit organization with demonstrated expertise in academic program development.

"(4) COORDINATION.—In carrying out this subsection, the Director shall consult and cooperate with the programs and policies of other relevant Federal agencies to avoid duplication with and enhance the effectiveness of the program under this subsection.

"(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the Foundation $2,000,000 in each of fiscal years 2020 through 2024 to carry out this subsection.".

(b) EVALUATION.—

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

(2) REQUIREMENTS.—In conducting the evaluation under paragraph (1), the Director of the National Science Foundation shall, as practicable—

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

(B) include an assessment of the effectiveness of such grant programs in expanding access to high quality STEM education, research, and outreach at tribal colleges and universities, as applicable;

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

(D) assess the percentage of students participating in such grant programs who successfully complete their education programs.

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

SEC. 11. REPORT TO CONGRESS.

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

(1) a description and evaluation of the status and usage of policies implemented pursuant to section 3 at all Federal science agencies, including any recommendations for revising or expanding such policies;

(2) with respect to efforts to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants under section 5—

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

(B) a description of any significant updates to the policies for review of Federal research grants required under such section; and

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

(3) a description and evaluation of the status of institution of higher education and Federal laboratory policies and practices required under section 7(a), including any recommendations for revising or expanding such policies.

SEC. 12. MERIT REVIEW.

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

SEC. 13. DEFINITIONS.

In this Act:

(1) DIRECTOR.—The term "Director" means the Director of the Office of Science and Technology Policy.

(2) FEDERAL LABORATORY.—The term "Federal laboratory" has the meaning given such term in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703).

(3) FEDERAL SCIENCE AGENCY.—The term "Federal science agency" means any Federal agency with at least $100,000,000 in research and development expenditures in fiscal year 2018.

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

(5) INTERAGENCY WORKING GROUP ON INCLUSION IN STEM.—The term "interagency working group on inclusion in STEM" means the interagency working group established by section 308 of the American Innovation and Competitiveness Act (42 U.S.C. 6626).

(6) STEM.—The term "STEM" means science, technology, engineering, and mathematics, including computer science.

II. PURPOSE OF THE BILL

The purpose of the bill is to provide for research and evidence-based interventions to address the underrepresentation of women and racial and ethnic minority groups in STEM studies and research careers at institutions of higher education and at Federal laboratories.

III. BACKGROUND AND NEED FOR THE LEGISLATION

The U.S. science and engineering enterprise is essential to national defense, the public welfare, economic competitiveness, and the capacity to address national challenges. While the U.S. continues to lead the world in spending on science research, advanced STEM degrees, high-quality research publications, and Nobel laureates, the nation's long-standing dominance in science and innovation is eroding. Other nations are investing heavily in their STEM workforce. In 2014, almost half of all STEM bachelor's degrees were conferred in India (25 percent) and China (22 percent), compared with 10 percent conferred in the U.S. China increased spending on research and development by 18 percent per year between 2000 and 2015, compared with 4 percent in the U.S. China has accelerated its research output in recent years, surpassing the U.S. in the number of research articles published for the first time in 2016. One of the key challenges facing the U.S. science and engineering enterprise is a lack of diversity in the STEM workforce.

Despite accounting for one-half of the college-educated workforce, in 2015 women represented 28 percent of people working in STEM occupations. Women's participation in the STEM workforce varies across STEM fields. While women have made significant gains in fields like biological, agricultural, and environmental sciences (47.9 percent), their proportions are low in engineering (14.5 percent) and computer and mathematical science (26.4).

Low rates of women in the STEM workforce is driven, in part, by their underrepresentation in STEM degree programs. Women's share of bachelor's degrees fell between 2006 and 2016 in computer science (from 20.7 to 18.7 percent) and physics (from 20.7 to 19.3

percent) and women earned only 20.9 percent of bachelor's degrees in engineering. For women of color, the disparity is more pronounced. In 2016, Hispanic women comprised 10.6 percent of the college-age population yet earned just 1.9 percent of bachelor's degrees in computer science and 2.3 percent of bachelor's degrees in engineering. While black women comprise 7.6 percent of the college-age population, their share of bachelor's degrees most STEM fields is stagnated or in decline. Black women earned just 1 percent of engineering bachelor's degrees in 2016, down from 1.5 percent in 2006. The sharpest decline was in computer science, which fell from 4.4 percent to 2.2 percent.

Compared with their proportions in the U.S. population, members of racial and ethnic minority groups are significantly underrepresented in the STEM workforce. Asians and whites are overrepresented. While the representation of American Indians in STEM occupations increased from 1993 (0.2 percent) to 2006 (0.4 percent), that progress was reversed and only 0.2 percent of STEM occupations were held by American Indians in 2015. While Hispanic employment in STEM occupations has steadily increased (from 2.9 to 6 percent) from 1993 to 2015, progress for African Americans has been much slower (from 3.6 to 4.8 percent).

IV. Committee Hearings

On May 9, 2019, the full Committee held a hearing entitled, "Achieving the Promise of a Diverse STEM Workforce." This was the first hearing the Committee held focused solely on the issue of diversity in STEM since 2010. The purpose of the hearing was to explore the need for a diverse STEM workforce and assess the lessons learned, model programs, enduring challenges, and future opportunities for expanding access to STEM studies and careers. The Committee also received testimony on H.R. 2528 the *STEM Opportunities Act of 2019*.

Five witnesses testified: (1) Dr. Mae Jemison, Principal, 100 Year Starship. Dr. Jemison provided testimony on a National Academies of Science study underway to examine "the evidence behind the most successful policies, practices, and strategies that have demonstrated effectiveness in opening doors to women's participation and success" in STEM. (2) Dr. Shirley Malcom, Senior Advisor and Director of SEA Change, American Association for the Advancement of Science. Dr. Malcom provided testimony on the SEA Change initiative and other AAAS activities in support of increasing diversity in STEM. (3) Dr. Lorelle Espinosa, Vice President for Research, American Council on Education. Dr. Espinosa provided testimony on the findings and recommendations of the 2018 National Academies of Science report entitled *Minority Serving Institutions: America's Underutilized Resource for Strengthening the STEM Workforce*. (4) Dr. James L. Moore III, Vice Provost for Diversity and Inclusion and Chief Diversity Officer, The Ohio State University. Dr. Moore provided testimony on activities at The Ohio State University institution to address the issue of diversity and the role that public and land-grant universities play in broadening participation in STEM. (5) Ms. Barbara Whye, Chief Diversity and Inclusion Officer, Vice President of Human Resources, Intel. Ms. Whye provided testimony on efforts underway at Intel to increase the diversity of its workforce.

V. Committee Consideration and Votes

On May 7, 2019 Chairwoman Eddie Bernice Johnson and Ranking Member Frank Lucas introduced H.R. 2528, the *STEM Opportunities Act of 2019*. The bill was referred to the House Committee on Science, Space, and Technology.

On June 20, 2019, the Committee on Science, Space, and Technology met to consider H.R. 2528. Ms. Johnson offered an amendment in the nature of a substitute to make technical corrections and conforming changes. *The amendment was agreed to on a voice vote*. Mr. Lipinski offered an amendment to include discussions of best practices for mentoring postdoctoral researchers in the scope of workshops carried out by Federal science agencies. The amendment also includes activities to encourage postdoctoral researchers from underrepresented minorities groups to enter academic careers as an allowable use of funds for grants awarded by the Director of the National Science Foundation (NSF). *The amendment was agreed to on a voice vote*. Ms. Johnson moved that the Committee favorably report the bill, H.R. 2528, to the House with the recommendation that the bill be approved. *The motion was agreed to by a voice vote*.

VI. Summary of Major Provisions of the Bill

The Act requires all Federal science agencies, based on guidance developed by the Office of Science and Technology Policy, to establish and maintain policies to support principal investigators who have caregiving responsibilities; collect demographic data on research grant applications; implement evidence-based policies to raise awareness of and reduce the impact of implicit bias in the merit-review process; disseminate guidance to universities and Federal labs on best practices for assessing organizational culture and climate and raising awareness of research on implicit bias; and carry out workshops for leaders in STEM departments at universities and Federal labs about minimizing implicit bias in STEM.

The Act requires the National Science Foundation (NSF) to publish a statistical summary of the data collected by all agencies on research grant applications; carry out a survey to collect demographic data on STEM faculty at colleges and universities; award grants to analyze data collected under this Act; and assess the impact of policies and practices implemented under this Act. Further, the Act authorizes NSF to award grants to support increased diversity of students and faculty at colleges and universities and to increase the participation of tribal populations in computer science education programs through its Tribal Colleges and Universities Program.

VII. Section-by-Section Analysis (by Title and Section)

Section 1. Short title; Table of Contents; Findings

STEM Opportunities Act of 2019

Section 2. Purposes

The purposes of this Act are to: (1) ensure Federal science agencies and institutions of higher education are fully engaging their entire talent pool; (2) to provide for research and data collection on

the participation and trajectories of groups historically underrepresented in STEM studies and careers; (3) to raise awareness within Federal science agencies and institutions of higher education about the barriers faced by these groups; (4) to identify, disseminate, and implement best practices for lowering these barriers at Federal science agencies and institutions of higher education; (5) to provide grants to institutions of higher education to implement or expand evidence-based reforms to increase the number of individuals from underrepresented groups in STEM studies and careers.

Section 3. Federal science agency policies for caregivers

Requires OSTP to develop guidance to Federal science agencies regarding establishment of policies to provide no-cost extensions and flexibility in award start time to grantees with caregiving responsibilities.

Section 4. Collection and reporting of data on Federal research grants

Requires each Federal science agency to collect comprehensive demographic data on recipients of Federal grants and to report this data to NSF for summarization and publication.

Section 5. Policies for review of Federal research grants

Requires Federal science agencies to implement recommendations from the 2016 OSTP Report "Reducing the Impact of Bias in the STEM Workforce" in reviewing grant applications, hiring policies, and workforce policies. Also requires agencies to carry out pilot programs and develop evidence-based policies to minimize the effect of implicit bias in the grant review process.

Section 6. Collection of data on demographics of faculty

Requires NSF to carry out a survey of STEM faculty demographics at institutions of higher education and to summarize and publish data collected under this section. Authorizes $3 million for each of fiscal years 2020 through 2022 for this purpose.

Section 7. Cultural and institutional barriers to expanding the academic and Federal STEM workforce

Requires OSTP to develop and disseminate guidance to universities and Federal laboratories on best practices to help identify any cultural or institutional barriers limiting the recruitment, retention, and advancement of women and minorities in STEM research careers. Directs NSF to develop policies to requiring institutions to report on steps taken based on OSTP guidance. Requires OSTP to develop uniform policy guidance on agency support for workshops for researchers and STEM departments on methods that minimize the effects of implicit bias. Authorizes $1 million for each of fiscal years 2020 through 2024 for NSF to carry out this section.

Section 8. Research and dissemination at the National Science Foundation

Requires NSF to award research grants and carry out dissemination activities using data from Sections 4 and 6. Authorizes $5 million for each of fiscal years 2020 through 2024 for this purpose.

Section 9. Research and related activities to expand STEM opportunities

Requires NSF to award grants to universities to implement or expand research-based practices aimed at increasing the recruitment, retention, and advancement of minority faculty. Authorizes $8 million for each of fiscal years 2020 through 2024 for this purpose. Further, authorizes NSF to award grants to research, develop and assess scalable reforms in undergraduate STEM education, with a focus on increasing the recruitment and retention of minority students. Authorizes $15 million for each of fiscal years 2020 through 2024 for this purpose.

Section 10. Tribal Colleges and Universities Program

Requires NSF to award grants through the Tribal Colleges and Universities Program to increase participation in computer science and computational thinking education programs. Authorizes $2 million for each of fiscal years 2020 through 2024 for this purpose.

Section 11. Report to Congress

Requires OSTP submit a report to Congress with a description and evaluation of the status and usage of policies, and progress on efforts to minimize effects of implicit bias in the review of Federal research grants.

Section 12. Merit review

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

Section 13. Definitions

VIII. COMMITTEE VIEWS

The intent of this legislation is to accelerate progress in expanding access to STEM studies and careers for women and racial and ethnic minorities.

Section 3. The Committee intends for each Federal science agency to establish policies to provide accommodations for principal investigators with caregiving responsibilities. These policies should be harmonized across Federal science agencies to minimize administrative burden for institutions of higher education and Federal laboratories.

Section 4. The Committee acknowledges that each Federal science agency has distinct processes for collecting data on grant applications. The Committee intends for these processes to be standardized to the maximum extent practicable to enable these data to be statistically summarized and disaggregated and cross-tabulated using the indicated demographic characteristics. The Committee recognizes that Federal science agencies cannot mandate the provision of demographic data and intends for these data to be provided voluntarily. The Committee also intends for the privacy of individuals to be protected when small numbers become an issue. The Committee intends for only a statistical summary of the data collected by each Federal science agency to be made public. The Committee intends for the collection of proposal review rating and funding outcome data to identify applications rated as strong

or competitive, but not ultimately selected for funding. These data will help to identify any inequities in the merit-review process and inform interventions to address such inequities.

Section 7. The intent of the Act is to support, through workshop programs, the education of individuals in leadership positions at institutions of higher education and Federal laboratories about evidence-based methods for reducing the impact of implicit bias on the career advancement of STEM researchers. The Committee intends for this education to inform personnel management policies, procedures, and processes carried out by such leaders, including STEM department chairs and senior managers at Federal laboratories. Researchers not in leadership positions are not precluded from participating in workshop programs.

Section 9. While the Committee views commitment from institutional administrators and the likelihood that an institution will sustain or expand a proposed reform beyond the period of the grant as important metrics for selecting grant recipients, the Committee does not intend for small or under-resourced institutions to be excluded from consideration.

Section 10. The Committee intends for partnerships between tribal colleges and universities and an institution of higher education or nonprofit organization with demonstrated expertise in academic program development to be of mutual interest and benefit. The Committee intends that the process for collecting data as part of the evaluation of this grant program, be carried out in a culturally-sensitive manner.

IX. Cost Estimate

Pursuant to clause 3(c)(2) of rule XIII of the Rules of the House of Representatives, the Committee adopts as its own the estimate of new budget authority, entitlement authority, or tax expenditures or revenues contained in the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974.

X. Congressional Budget Office Cost Estimate

U.S. Congress,
Congressional Budget Office,
Washington, DC, July 24, 2019.

Hon. Eddie Bernice Johnson,
Chairwoman, Committee on Science, Space, and Technology,
House of Representatives, Washington, DC.

Dear Madam Chairwoman: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 2528, the STEM Opportunities Act of 2019.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Janani Shankaran.

Sincerely,

Phillip L. Swagel,
Director.

Enclosure.

At a Glance

H.R. 2528, STEM Opportunities Act of 2019

As ordered reported by the House Committee on Science, Space, and Technology on June 20, 2019

By Fiscal Year, Millions of Dollars	2019	2019-2024	2019-2029
Direct Spending (Outlays)	0	0	0
Revenues	0	0	0
Deficit Effect	0	0	0
Spending Subject to Appropriation (Outlays)	0	206	not estimated

Statutory pay-as-you-go procedures apply?	No	**Mandate Effects**	
Increases on-budget deficits in any of the four consecutive 10-year periods beginning in 2030?	No	Contains intergovernmental mandate?	No
		Contains private-sector mandate?	No

The bill would

- Authorize the appropriation of $30 million annually over the 2020-2024 period for the National Science Foundation (NSF) to award grants to study participation in science, technology, engineering, and mathematics (STEM) and computer science by people in underrepresented populations
- Authorize the appropriation of $14 million over the 2020-2024 period for the NSF to survey grantees and to establish policies on implicit bias at certain grantee institutions
- Establish a program for uniform data collection about grant applicants across certain agencies

Estimated budgetary effects would primarily stem from

- Spending of appropriations authorized for the NSF
- The program to collect data on grant applicants

Detailed estimate begins on the next page.

Bill summary: H.R. 2528 would specifically authorize appropriations totaling $164 million over the 2020–2024 period for the National Science Foundation to award grants to study participation in STEM and computer science education and employment by people in underrepresented groups, to carry out surveys, and to establish policies on implicit bias at certain grantee institutions. The bill also would initiate a program to collect data uniformly about grant applicants across certain federal agencies and would require those agencies to implement other activities to improve the recruitment and retention of people in underrepresented populations in STEM fields.

Estimated federal cost: The estimated budgetary effect of H.R. 2528 is shown in Table 1. The costs of the legislation fall primarily within budget function 250 (general science, space, and technology).

TABLE 1.—ESTIMATED INCREASES IN SPENDING SUBJECT TO APPROPRIATION UNDER H.R. 2528

	By fiscal year, millions of dollars—						
	2019	2020	2021	2022	2023	2024	2019–2024
NSF Grants:							
Authorization	0	30	30	30	30	30	150
Estimated Outlays	0	5	17	24	30	30	106
Data Collection Program:							
Estimated Authorization	0	16	17	12	12	12	69
Estimated Outlays	0	16	17	12	12	12	69

TABLE 1.—ESTIMATED INCREASES IN SPENDING SUBJECT TO APPROPRIATION UNDER H.R. 2528—Continued

	By fiscal year, millions of dollars—						
	2019	2020	2021	2022	2023	2024	2019–2024
Other Activities:							
Estimated Authorization	0	8	7	7	5	4	31
Estimated Outlays	0	8	7	7	5	4	31
Total Changes:							
Estimated Authorization	0	54	54	49	47	46	250
Estimated Outlays	0	29	41	43	47	46	206

Basis of estimate: For this estimate, CBO assumes that the legislation will be enacted near the end of 2019 and that the authorized and necessary amounts will be appropriated each year. Estimated outlays are based on historical spending patterns for similar activities. CBO estimates that implementing H.R. 2528 would cost $206 million over the 2020–2024 period.

NSF grants: H.R. 2528 would authorize the appropriation of $30 million annually over the 2020–2024 period for the NSF to award grants to nonprofit organizations and institutions of higher education to develop policies and programs that improve the recruitment, retention, and advancement of people in underrepresented populations in academic STEM careers, undergraduate STEM education, and computer science and to carry out data analysis on the demographic characteristics of applicants for federal research and development (R&D) grants. CBO estimates that providing those grants would cost $106 million over the 2020–2024 period and $44 million after 2024.

Data collection program: Section 4 would direct federal agencies with at least $100 million in R&D spending in 2018 to collect and submit detailed information to the NSF about their federal R&D grant applicants. The Office of Science and Technology Policy (OSTP) and the NSF would be required to establish a policy to ensure that the data are collected uniformly. CBO expects that five agencies—the Departments of Agriculture, Defense, Energy, and Health and Human Services and the National Aeronautics and Space Administration—would incur higher costs to comply with the new policy, to update databases, and to prepare data for annual submission. Using information from those agencies, CBO estimates that implementing the bill's provisions would cost OSTP and each agency, on average, about $1 million annually for additional staff.

In addition, using information from the NSF, CBO estimates that the agency would incur average annual costs of $8 million to implement the data collection program. About half of that amount would be for 25 additional employees at an average annual cost of $150,000 each; the other half would be for database maintenance. In total, CBO estimates, implementing section 4 would cost $69 million over the 2020–2024 period.

Other activities: The bill would authorize the appropriation of $3 million annually over the 2020–2022 period for the NSF to create and distribute surveys to collect demographic information on STEM faculty at grantee institutions. In addition, the bill would authorize the appropriation of $1 million annually over the 2020–2024 period for the NSF to develop a policy on implicit bias at doctoral-degree-

granting institutions that receive federal funding. CBO estimates that implementing those activities would cost $14 million over the 2020–2024 period.

H.R. 2528 also would require agencies to implement the recommendations of a previous OSTP report on implicit bias, conduct pilot orientation activities to train agency staff concerning implicit bias, and hold related workshops in conjunction with meetings of STEM-related organizations. Finally, the NSF would be required to report on the implementation of activities under the bill. Based on the costs of similar tasks, CBO estimates that meeting those and other requirements would cost about $3 million annually, and $17 million over the 2020–2024 period.

Pay-As-You-Go considerations: None.

Increase in long-term deficits: None.

Mandates: None.

Estimate prepared by: Federal Costs: Janani Shankaran; Mandates: Brandon Lever.

Estimate reviewed by: Kim P. Cawley, Chief, Natural and Physical Resources Cost Estimates Unit; H. Samuel Papenfuss, Deputy Assistant Director for Budget Analysis.

XI. Federal Mandates Statement

H.R. 2528 contains no unfunded mandates.

XII. Committee Oversight Findings and Recommendations

The Committee's oversight findings and recommendations are reflected in the body of this report.

XIII. Statement on General Performance Goals and Objectives

Pursuant to clause 3(c) of House Rule XIII, the goal of H.R. 2528 is to direct the Director of the Office of Science and Technology Policy and Federal science agencies 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 the entire talent pool of the United States, and for other purposes.

XIV. Federal Advisory Committee Statement

H.R. 2528 does not create any advisory committees.

XV. Duplication of Federal Programs

Pursuant to clause 3(c)(5) of rule XIII of the Rules of the House of Representatives, the Committee finds that no provision of H.R. 2528 establishes or reauthorizes a program of the federal government known to be duplicative of another federal program, including any program that was included in a report to Congress pursuant to section 21 of Public Law 111–139 or the most recent Catalog of Federal Domestic Assistance.

XVI. EARMARK IDENTIFICATION

Pursuant to clause 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 2528 contains no earmarks, limited tax benefits, or limited tariff benefits.

XVII. APPLICABILITY TO THE LEGISLATIVE BRANCH

The Committee finds that H.R. 25228 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVIII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any state, local, or tribal law.

XIX. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, and existing law in which no change is proposed is shown in roman):

AMERICAN INNOVATION AND COMPETITIVENESS ACT

* * * * * * *

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

* * * * * * *

SEC. 305. PROGRAMS TO EXPAND STEM OPPORTUNITIES.

(a) FINDINGS.—Congress makes the following findings:

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

(2) Women represent slightly more than half the United States population, and projections indicate that 54 percent of the population will be a member of a racial or ethnic minority group by 2050.

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

(4) A 2014 National Center for Education Statistics study found that underrepresented populations leave the STEM fields at higher rates than their counterparts.

(5) The representation of women in STEM drops significantly at the faculty level. Overall, women hold only 25 percent of all tenured and tenure-track positions and 17 percent of full pro-

fessor positions in STEM fields in our Nation's universities and 4-year colleges.

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

(7) Many of the numbers in the American Indian or Alaskan Native and Native Hawaiian or Other Pacific Islander categories for different faculty ranks were too small for the Foundation to report publicly without potentially compromising confidential information about the individuals being surveyed.

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

(1) it is critical to our Nation's economic leadership and global competitiveness that the United States educate, train, and retain more scientists, engineers, and computer scientists;

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

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

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

(c) REAFFIRMATION.—The Director of the Foundation shall continue to support programs designed to broaden participation of underrepresented populations in STEM fields.

(d) GRANTS TO BROADEN PARTICIPATION.—

(1) IN GENERAL.—The Director of the Foundation shall award grants on a competitive, merit-reviewed basis, to eligible entities to increase the participation of underrepresented populations in STEM fields, including individuals identified in section 33 or section 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a, 1885b).

(2) CENTER OF EXCELLENCE.—

(A) IN GENERAL.—Grants awarded under this subsection may include grants for the establishment of a Center of Excellence to collect, maintain, and disseminate information to increase participation of underrepresented populations in STEM fields.

(B) PURPOSE.—The purpose of a Center of Excellence under this subsection is to promote diversity in STEM fields by building on the success of the INCLUDES programs, providing technical assistance, maintaining best practices, and providing related training at federally funded academic institutions.

(e) SUPPORT FOR INCREASING DIVERSITY AMONG STEM FACULTY AT INSTITUTIONS OF HIGHER EDUCATION.—

(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or consortia thereof) for the development and assessment of innovative reform efforts designed to increase the recruitment, retention, and advancement of individuals from underrepresented minority groups in academic STEM careers.

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

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

(A) institutional assessment activities, such as data analyses and policy review, in order to identify and address specific issues in the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

(B) implementation of institution-wide improvements in workload distribution, such that faculty members from underrepresented minority groups are not disadvantaged in the amount of time available to focus on research, publishing papers, and engaging in other activities required to achieve tenure status and run a productive research program;

(C) development and implementation of training courses for administrators and search committee members to ensure that candidates from underrepresented minority groups are not subject to implicit biases in the search and hiring process;

(D) development and hosting of intra- or inter-institutional workshops to propagate best practices in recruiting, retaining, and advancing faculty members from underrepresented minority groups;

(E) professional development opportunities for faculty members from underrepresented minority groups;

(F) activities aimed at making undergraduate STEM students from underrepresented minority groups aware of opportunities for academic careers in STEM fields;

(G) activities to identify and engage exceptional graduate students and postdoctoral researchers from underrepresented minority groups at various stages of their studies and to encourage them to enter academic careers; and

(H) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

(4) SELECTION PROCESS.—

(A) APPLICATION.—An institution of higher education (or a consortium of such institutions) seeking funding under this subsection shall submit an application to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum, a description of—

(i) the reform effort that is being proposed for implementation by the institution of higher education;

(ii) any available evidence of specific difficulties in the recruitment, retention, and advancement of faculty members from underrepresented minority groups in STEM academic careers within the institution of higher education submitting an application, and how the proposed reform effort would address such issues;

(iii) how the institution of higher education submitting an application plans to sustain the proposed reform effort beyond the duration of the grant; and

(iv) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to the national knowledge base about models for catalyzing institutional change.

(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection, the Director of the Foundation shall consider, at a minimum—

(i) the likelihood of success in undertaking the proposed reform effort at the institution of higher education submitting the application, including the extent to which the administrators of the institution are committed to making the proposed reform effort a priority;

(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is placed on the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

(iii) the likelihood that the institution of higher education will sustain or expand the proposed reform effort beyond the period of the grant; and

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

(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent practicable, that grants awarded under this section are made to a variety of types of institutions of higher education.

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

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

(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or a consortium of such institutions) to implement or expand research-based reforms in undergraduate STEM education for the purpose of recruiting and retaining students from minority groups who are underrepresented in STEM fields.

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

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

(A) implementation or expansion of innovative, research-based approaches to broaden participation of underrepresented minority groups in STEM fields;

(B) implementation or expansion of bridge, cohort, tutoring, or mentoring programs, including those involving community colleges and technical schools, designed to enhance the recruitment and retention of students from underrepresented minority groups in STEM fields;

(C) implementation or expansion of outreach programs linking institutions of higher education and K–12 school systems in order to heighten awareness among pre-college students from underrepresented minority groups of opportunities in college-level STEM fields and STEM careers;

(D) implementation or expansion of faculty development programs focused on improving retention of undergraduate STEM students from underrepresented minority groups;

(E) implementation or expansion of mechanisms designed to recognize and reward faculty members who demonstrate a commitment to increasing the participation of students from underrepresented minority groups in STEM fields;

(F) expansion of successful reforms aimed at increasing the number of STEM students from underrepresented minority groups beyond a single course or group of courses to achieve reform within an entire academic unit, or expansion of successful reform efforts beyond a single academic unit or field to other STEM academic units or fields within an institution of higher education;

(G) expansion of opportunities for students from underrepresented minority groups to conduct STEM research in industry, at Federal labs, and at international research institutions or research sites;

(H) provision of stipends for students from underrepresented minority groups participating in research;

(I) development of research collaborations between research-intensive universities and primarily undergraduate minority-serving institutions;

(J) support for graduate students and post–doctoral fellows from underrepresented minority groups to participate in instructional or assessment activities at primarily undergraduate institutions, including primarily undergraduate minority-serving institutions and two-year institutions of higher education; and

(K) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

(4) SELECTION PROCESS.—

(A) APPLICATION.—An institution of higher education (or a consortia thereof) seeking a grant under this subsection shall submit an application to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum—

(i) a description of the proposed reform effort;

(ii) a description of the research findings that will serve as the basis for the proposed reform effort or, in the case of applications that propose an expansion of a previously implemented reform, a description of the previously implemented reform effort, including data about the recruitment, retention, and academic achievement of students from underrepresented minority groups;

(iii) evidence of an institutional commitment to, and support for, the proposed reform effort, including a long-term commitment to implement successful strategies from the current reform beyond the academic unit or units included in the grant proposal;

(iv) a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching assignment that reward faculty contributions to improving the education of students from underrepresented minority groups in STEM; and

(v) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to the national knowledge base about models for catalyzing institutional change.

(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection, the Director of the Foundation shall consider, at a minimum—

(i) the likelihood of success of the proposed reform effort at the institution submitting the application, including the extent to which the faculty, staff, and administrators of the institution are committed to making the proposed institutional reform a priority of the participating academic unit or units;

(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is placed on faculty engagement in the retention of students from underrepresented minority groups;

(iii) the likelihood that the institution will sustain or expand the proposed reform effort beyond the period of the grant; and

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

(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent practicable, that grants awarded under this subsection are made to a variety of types of institutions of higher education, including two-year and minority-serving institutions of higher education.

(5) EDUCATION RESEARCH.—

(A) IN GENERAL.—All grants made under this subsection shall include an education research component that will support the design and implementation of a system for data collection and evaluation of proposed reform efforts in order to build the knowledge base on promising models for increasing recruitment and retention of students from underrepresented minority groups in STEM education at the undergraduate level across a diverse set of institutions.

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

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

[(e)] *(g)* ACCOUNTABILITY AND DISSEMINATION.—

(1) EVALUATION.—

(A) IN GENERAL.—Not later than 5 years after the date of enactment of this Act, the Director of the Foundation shall evaluate the grants provided under this section.

(B) REQUIREMENTS.—In conducting the evaluation under subparagraph (A), the Director shall—

(i) use a common set of benchmarks and assessment tools to identify best practices and materials developed or demonstrated by the research; and

(ii) to the extent practicable, combine the research resulting from the grant activity under subsection (e) with the current research on serving underrepresented students in grades kindergarten through 8.

(2) REPORT ON EVALUATIONS.—Not later than 180 days after the completion of the evaluation under paragraph (1), the Director of the Foundation shall submit to the appropriate committees of Congress and make widely available to the public a report that includes—

(A) the results of the evaluation; and

(B) any recommendations for administrative and legislative action that could optimize the effectiveness of the program.

[(f)**]** *(h)* COORDINATION.—In carrying out this section, the Director of the Foundation shall consult and cooperate with the programs and policies of other relevant Federal agencies to avoid duplication with and enhance the effectiveness of the program under this section.

* * * * * * *

AMERICA COMPETES REAUTHORIZATION ACT OF 2010

* * * * * * *

TITLE V—SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS SUPPORT PROGRAMS SUBTITLE A—NATIONAL SCIENCE FOUNDATION

Subtitle A—NATIONAL SCIENCE FOUNDATION

* * * * * * *

SEC. 525. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.

(a) IN GENERAL.—The Director shall continue to support a program to award grants on a competitive, merit-reviewed basis to tribal colleges and universities (as defined in section 316 of the Higher Education Act of 1965 (20 U.S.C. 1059c), including institutions described in section 317 of such Act (20 U.S.C. 1059d), to enhance the quality of undergraduate STEM education at such institutions and to increase the retention and graduation rates of Native American students pursuing associate's or baccalaureate degrees in STEM.

(b) PROGRAM COMPONENTS.—Grants awarded under this section shall support—

(1) activities to improve courses and curriculum in STEM;

(2) faculty development;

(3) stipends for undergraduate students participating in research; and

(4) other activities consistent with subsection (a), as determined by the Director.

(c) INSTRUMENTATION.—Funding provided under this section may be used for laboratory equipment and materials.

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

(1) IN GENERAL.—The Director, as part of the program authorized under this section, shall award grants on a competitive, merit-reviewed basis to eligible entities to increase the participation of tribal populations in computer science and computational thinking education programs to enable students to develop skills and competencies in coding, problem-solving, critical thinking, creativity and collaboration.

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

(A) research and development needed to bring computer science and computational thinking courses and degrees to tribal colleges and universities;

(B) research and development of instructional materials needed to integrate computer science and computational thinking into programs that are culturally relevant to students attending tribal colleges and universities;

(C) research, development and evaluation of distance education for computer science and computational thinking courses and degree programs for students attending tribal colleges and universities; and

(D) other activities consistent with the activities described in paragraphs (1) through (4) of subsection (b), as determined by the Director.

(3) PARTNERSHIPS.—A tribal college or university seeking a grant under this subsection, or a consortia thereof, may partner with an institution of higher education or nonprofit organization with demonstrated expertise in academic program development.

(4) COORDINATION.—In carrying out this subsection, the Director shall consult and cooperate with the programs and policies of other relevant Federal agencies to avoid duplication with and enhance the effectiveness of the program under this subsection.

(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the Foundation $2,000,000 in each of fiscal years 2020 through 2024 to carry out this subsection.

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XX. Proceedings of the Full Committee Markup

MARKUPS: H.R. 2528, STEM Opportunities Act of 2019; H.R. 36, Combating Sexual Harassment in Science Act of 2019; H.R. 3196, Vera Rubin Survey Telescope Designation Act; and H.R. 3153, Expanding Findings for Federal Opioid Research and Treatment Act

MARKUP

BEFORE THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

JUNE 20, 2019

Serial No. CP 116–4

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COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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CONTENTS

JUNE 20, 2019

MARKUPS: H.R. 2528, STEM Opportunities Act of 2019; H.R. 36, Combating Sexual Harassment in Science Act of 2019; H.R. 3196, Vera Rubin Survey Telescope Designation Act; and H.R. 3153, Expanding Findings for Federal Opioid Research and Treatment Act

THURSDAY, JUNE 20, 2019

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to notice, at 10:04 a.m., in room 2318, Rayburn House Office Building, Hon. Eddie Bernice Johnson [Chairwoman of the Committee] presiding.

Chairwoman JOHNSON. Good morning. The Committee will come to order. And without objection, the Chair is authorizes to declare recess at any time. Pursuant to Committee rule 2(e) and House rule XI, the Chair announces that she may postpone roll call votes.

Pursuant to notice, the Committee meets to consider the following measures: H.R. 2528, *STEM Opportunities Act of 2019*; H.R. 36, *Combating Sexual Harassment in Science Act of 2019*; H.R. 3196, *Vera Rubin Survey Telescope Designation Act*; and H.R. 3153, *Expanding Findings for Federal Opioid Research and Treatment Act*.

I want to welcome everyone to today's markup. Today, we meet to mark up four good bipartisan bills. First, we will consider the *STEM Opportunities Act*, which has been a priority of mine of course for many years. This bill will help us address the disparity in the number of women and minorities in the STEM fields.

Without including all of our Nation's brain power in the fight for 21st-century competitiveness, it is unlikely that our country will remain the world leader in science and innovation. It is therefore my hope that this bill will play a major role in ensuring our country's competitiveness in the coming years.

It is not enough to simply attract women to the STEM fields. We must also ensure they stay in these fields, and the second bill in our markup addresses one of the reasons women leave the STEM sciences in such high rates: Sexual harassment. The problem of sexual harassment in the STEM fields has not been addressed in a comprehensive fashion. I hope that the *Combating Sexual Har-*

assment in Science Act of 2019 can play an important role in focusing Federal efforts to stamp out sexual harassment in the sciences.

I want to take a moment to recognize my colleague Ranking Member Lucas, who is an original co-sponsor of both of these bills. Both he and his staff have provided very constructive input into these bills and the hearings we held on these topics. I think the bills before us today are better off because of these efforts, and I want to sincerely thank him and his staff for their work.

The third bill before us today is the *Vera Rubin Survey Telescope Designation Act*. I'll speak more about this bill in a minute, but I think it is appropriate that on the same day our Committee tries to address the issues facing women in the STEM fields, we also take a moment to recognize a woman who overcame the hurdles she faced to provide significant contributions to the field of astronomy.

Finally, we will consider the *Expanding Findings for Federal Opioid Research and Treatment Act*, which is offered by Ms. Wexton. The scourge of opioid addiction is one of the most serious problems facing our Nation right now. It only makes sense to bring all of our resources to bear on this issue, and I think the National Science Foundation (NSF) can bring unique capabilities to the fight to better understand and deal with this critical issue.

I look forward to a productive markup and moving these bills very quickly to the House floor.

[The prepared statement of Chairwoman Johnson follows:]

I want to welcome everyone to today's markup. Today we meet to markup four good bipartisan bills.

First, we will consider the *STEM Opportunities Act*, which has been a priority of mine for many years. This bill will help us address the disparity in the number of women and minorities in the STEM fields.

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The problem of sexual harassment in the STEM fields has not been addressed in a comprehensive fashion. I hope that the *Combating Sexual Harassment in Science Act of 2019* can play an important role in focusing federal efforts to stamp out sexual harassment in the sciences.

I want to take a moment to recognize my friend and colleague, Ranking Member Lucas, who is an original cosponsor of both of these bills. Both he and his staff have provided very constructive input into these bills and the hearings we have held on these topics. I think the bills before us today are better off because of these efforts, and I want to sincerely thank him and his staff for their work.

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I look forward to a productive markup and moving these bills very quickly to the House floor.

Chairwoman JOHNSON. I now recognize the Ranking Member to present an opening statement.

Mr. LUCAS. Thank you, Chairwoman Johnson, for holding this markup.

Today, we'll consider four bipartisan bills. The first is H.R. 2528, *STEM Opportunities Act of 2019*. H.R. 2528 continues this Committee's long bipartisan history of supporting and expanding STEM education for all. The only way we'll achieve our potential is by utilizing America's most valuable resource: Our people. That means developing a diverse STEM-capable workforce at every education level and from every background.

One of the key provisions of H.R. 2528 is a requirement for more comprehensive data collection and analysis on the students, researchers, and faculty receiving Federal science grants. This data will help us identify and reduce the barriers that prevent underrepresented groups from entering and advancing in STEM. It will also help us measure the success of Federal STEM programs.

The bill also includes a provision directing NSF to support computer science education through the existing Tribal Colleges and Universities program. Access to computer science resources and the development of computing skills is critical in today's economy. I am pleased to join Chairwoman Johnson in cosponsoring this legislation. I want to thank her and her entire staff for working with us to refine the bill for reintroduction and incorporating our feedback and ideas. I look forward to continuing to work with the Chairwoman and Members of the Committee to advance more STEM education efforts for this Congress to support, encourage, and develop the next generation of STEM students.

Our second bill this morning is H.R. 36, *Combating Sexual Harassment in Science Act of 2019*. Chairwoman Johnson and I made this one of our highest priorities, introducing it on the first day of the 116th Congress. This bill has a foundation of more than a year of investigation, analysis, and recommendations to the Science Committee. Engaging more women in STEM studies and careers is essential to American competitiveness. Women make up half the workforce but account for less than 25 percent of America's STEM workforce.

Unfortunately, too many women have been driven out of STEM careers due to a culture of harassment and abuse. H.R. 36 takes the first steps to addressing this problem. The bill supports the adoption of uniform guidance across the Federal science agencies to reduce the prevalence of sexual harassment involving grant personnel. The bill also directs the NSF to conduct further research into the causes and consequences of harassment, as well as interventions to mitigate the problem.

There is an established legal process in place within higher education and in the workplace for handling claims of sexual harassment. This bill does not alter that process. What this bill does do is create a uniform policy for universities and research institutions to report to Federal science agencies when an administrative action is taken that impacts the ability of a researcher to carry out a grant. We want to ensure the safety of all grant personnel supported by taxpayer funding. I'll be offering an amendment later in the markup that we hope makes this requirement even more clear.

Again, thank you, Chairwoman Johnson, for working in a bipartisan and collaborative way to move this legislation forward.

Next, we will consider H.R. 3196, *Vera Rubin Survey Telescope Designation Act*, sponsored by Chairwoman Johnson and Representative Jenniffer González-Colón. This bill honors the contributions of the late Dr. Vera Rubin, an astronomer who made groundbreaking discoveries in the field of dark matter and was a pioneer and life-long advocate for women in astronomy.

This new LSST (Large Synoptic Survey Telescope), under construction in Chile, funded by the National Science Foundation and the Department of Energy, will photograph the entire sky every few nights. One of the goals of the project is to study the nature of dark matter and dark energy. Naming the observatory in her honor is a fitting tribute to the contributions to the field, and I—her contributions to the field, I should note, and I hope will inspire future generations of women in astronomy.

Finally, the Committee will consider H.R. 3153, *Expanding Findings for Federal Opioid Research and Treatment Act*. This legislation identifies current gaps that exist in research on the prevention and treatment of opioid addiction and authorizes the NSF to support research grants in those areas.

I want to thank Representative Jennifer Wexton and Representative Jim Baird for their bipartisan work on this bill. Opioid addiction affects too many in our communities, and I applaud this effort to support more basic research on the science of addiction.

Once again, thank you, Chairwoman Johnson, for holding today's markup, and I encourage the Members of the Committee to support all these bills.

I yield back the balance of my time.

[The prepared statement of Mr. Lucas follows:]

Thank you, Chairwoman Johnson, for holding this mark-up. Today we will consider four bipartisan bills.

The first is H.R. 2528, *STEM Opportunities Act of 2019*. H.R. 2528 continues this Committee's long bipartisan history of supporting and expanding STEM education for all.

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One of the key provisions of H.R. 2528 is a requirement for more comprehensive data collection and analysis on the students, researchers, and faculty receiving federal science grants. This data will help us identify and reduce the barriers that prevent underrepresented groups from entering and advancing in STEM. It will also help us measure the success of federal STEM programs.

The bill also includes a provision directing NSF to support computer science education through the existing Tribal Colleges and Universities program. Access to computer science resources and the development of computing skills is critical in today's economy.

I was pleased to join Chairwoman Johnson in co-sponsoring this legislation. I want to thank her and her staff for working with us to refine the bill for reintroduction and incorporating our feedback and ideas.

I look forward to continuing to work with the Chairwoman and members of the Committee to advance more STEM education efforts this Congress to support, encourage and develop the next generation of STEM students.

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I thank Rep. Jennifer Wexton and Rep. Jim Baird for their bipartisan work on this bill. Opioid addiction affects too many in our communities, and I applaud this effort to support more basic research on the science of addiction.

Once again, thank you Chairwoman Johnson for holding today's mark-up, and I encourage the Members of this Committee to support these bills. I yield back the balance of my time.

Chairwoman JOHNSON. Thank you, Mr. Lucas.

H.R. 2528

10:13 a.m.

Chairwoman JOHNSON. We will now consider H.R. 2528, *STEM Opportunities Act of 2019*. The clerk will report the bill.

The CLERK. H.R. 2528, a bill to direct the Director——

[The bill follows:]

I

116TH CONGRESS
1ST SESSION

H. R. 2528

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 HOUSE OF REPRESENTATIVES

MAY 7, 2019

Ms. JOHNSON of Texas (for herself and Mr. LUCAS) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

---

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.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

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

(a) SHORT TITLE.—This Act may be cited as the "STEM Opportunities Act of 2019".

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

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

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

(2) Research shows that women and minorities who are interested in STEM careers are disproportionately lost at nearly every educational transition.

(3) The National Center for Science and Engineering Statistics at the National Science Foundation collects, compiles, and publishes data on the demographics of STEM degrees and STEM jobs in the United States.

(4) Women now earn nearly 37 percent of all STEM bachelor's degrees, but major variations persist among fields. In 2017, women earned only 20

percent of all bachelor's degrees awarded in engineering and 19 percent of bachelor's degrees awarded in computer sciences. Based on Bureau of Labor Statistics data, jobs in computing occupations are expected to account for nearly 60 percent of the projected annual growth of newly created STEM job openings from 2016 to 2026.

(5) In 2017, underrepresented minority groups comprised 39 percent of the college-age population of the United States, but only 18 percent of students who earned bachelor's degrees in STEM fields. The Higher Education Research Institute at the University of California, Los Angeles, found that, while freshmen from underrepresented minority groups express an interest in pursuing a STEM undergraduate degree at the same rate as all other freshmen, only 22.1 percent of Latino students, 18.4 percent of African-American students, and 18.8 percent of Native American students studying in STEM fields complete their degree within 5 years, compared to approximately 33 percent of White students and 42 percent of Asian students who complete their degree within 5 years.

(6) In some STEM fields, including the computer sciences, women persist at about the same rate

through doctorate degrees. In other STEM fields, women persist through doctorate degrees at a lower rate. In mathematics, women earn just 26 percent of doctorate degrees compared with 42 percent of undergraduate degrees. Overall, women earned 38 percent of STEM doctorate degrees in 2016. The rate of minority students earning STEM doctorate degrees in physics is 9 percent, compared with 15 percent for bachelor's degree. Students from underrepresented minority groups accounted for only 11.5 percent of STEM doctorate degrees awarded in 2016.

(7) The representation of women in STEM drops significantly from the doctorate degree level to the faculty level. Overall, women hold only 26 percent of all tenured and tenure-track positions and 27 percent of full professor positions in STEM fields in our Nation's universities and 4-year colleges. Black and Hispanic faculty together hold about 6.8 percent of all tenured and tenure-track positions and 7.5 percent of full professor positions. Many of the numbers in the American Indian or Alaskan Native and Native Hawaiian or Other Pacific Islander categories for different faculty ranks were too small for the National Science Foundation to report publicly

without potentially compromising confidential information about the individuals being surveyed.

(8) The representation of women is especially low at our Nation's top research universities. Even in the biological sciences, in which women now earn more than 50 percent of the doctorates and passed the 25 percent level 37 years ago, women make up only 25 percent of the full professors at the approximately 100 most research-intensive universities in the United States. In the physical sciences and mathematics, women make up only 11 percent of full professors, in computer sciences only 10 percent, and across engineering fields only 7 percent. The data suggest that approximately 6 percent of all tenure-track STEM faculty members at the most research-intensive universities are from underrepresented minority groups, but in some fields the numbers are too small to report publicly.

(9) By 2050, underrepresented minorities will comprise 52 percent of the college-age population of the United States. If the percentage of female students and students from underrepresented minority groups earning bachelor's degrees in STEM fields does not significantly increase, the United States will face an acute shortfall in the overall number of

students who earn degrees in STEM fields just as United States companies are increasingly seeking students with those skills. With this impending shortfall, the United States will almost certainly lose its competitive edge in the 21st century global economy.

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

(11) Female students and students from underrepresented minority groups at institutions of higher education who see few others "like themselves" among faculty and student populations often do not experience the social integration that is necessary for success in all disciplines, including STEM.

(12) One in five children in the United States attend school in a rural community. The data shows that rural students are at a disadvantage with respect to STEM readiness. Among STEM-interested students, 17 percent of students in rural high schools and 18 percent of students in town-located high schools meet the ACT STEM Benchmark, compared with 33 percent of students in suburban high schools and 27 percent of students in urban high schools.

(13) A substantial body of evidence establishes that most people hold implicit biases. Decades of cognitive psychology research reveal that most people carry prejudices of which they are unaware but that nonetheless play a large role in evaluations of people and their work. Unintentional biases and outmoded institutional structures are hindering the access and advancement of women, minorities, and other groups historically underrepresented in STEM.

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

(15) In 2012, the Office of Diversity and Equal Opportunity of the National Aeronautics and Space

Administration (in this Act referred to as "NASA") completed a report that—

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

(B) provides guidance that is usable by all institutions of higher education receiving significant Federal research funding on how to conduct meaningful self-evaluations of campus culture and policies.

(16) The Federal Government provides 55 percent of research funding at institutions of higher education and, through its grant-making policies, has had significant influence on institution of higher education policies, including policies related to institutional culture and structure.

SEC. 2. PURPOSES.

The purposes of this Act are as follows:

(1) To ensure that Federal science agencies and institutions of higher education receiving Federal research and development funding are fully engaging their entire talent pool.

(2) To promote research on, and increase understanding of, the participation and trajectories of

women, minorities, and other groups historically underrepresented in STEM studies and careers, including persons with disabilities and rural, poor, and tribal populations, at institutions of higher education and Federal science agencies, including Federal laboratories.

(3) To raise awareness within Federal science agencies, including Federal laboratories, and institutions of higher education about cultural and institutional barriers limiting the recruitment, retention, promotion, and other indicators of participation and achievement of women, minorities, and other groups historically underrepresented in academic and Government STEM research careers at all levels.

(4) To identify, disseminate, and implement best practices at Federal science agencies, including Federal laboratories, and at institutions of higher education to remove or reduce cultural and institutional barriers limiting the recruitment, retention, and success of women, minorities, and other groups historically underrepresented in academic and Government STEM research careers.

(5) To provide grants to institutions of higher education to recruit, retain, and advance STEM faculty members from underrepresented minority

groups and to implement or expand reforms in undergraduate STEM education in order to increase the number of students from underrepresented minority groups receiving degrees in these fields.

SEC. 3. FEDERAL SCIENCE AGENCY POLICIES FOR CAREGIVERS.

(a) OSTP GUIDANCE.—Not later than 6 months after the date of enactment of this Act, the Director shall provide guidance to each Federal science agency to establish policies that—

(1) apply to all—

(A) intramural and extramural research awards granted by such agency; and

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

(2) provide—

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

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

(C) grant supplements, as appropriate, to research awards for research technicians or equivalent positions to sustain research activities conducted under such awards; and

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

(b) UNIFORMITY OF GUIDANCE.—In providing guidance under subsection (a), the Director shall encourage uniformity and consistency in the policies established pursuant to such guidance across all Federal science agencies.

(c) ESTABLISHMENT OF POLICIES.—Consistent with the guidance under subsection (a), Federal science agencies shall—

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

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

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

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

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

SEC. 4. COLLECTION AND REPORTING OF DATA ON FEDERAL RESEARCH GRANTS.

(a) COLLECTION OF DATA.—

(1) IN GENERAL.—Each Federal science agency shall collect, as practicable, with respect to all applications for merit-reviewed research and development grants to institutions of higher education and Federal laboratories supported by that agency, the standardized record-level annual information on demographics, primary field, award type, institution type, review rating, budget request, funding outcome, and awarded budget.

(2) UNIFORMITY AND STANDARDIZATION.—The Director shall establish a policy to ensure uniformity and standardization of the data collection required under paragraph (1).

(3) RECORD-LEVEL DATA.—

(A) REQUIREMENT.—Beginning not later than 2 years after the date of the enactment of this Act, and on an annual basis thereafter, each Federal science agency shall submit to the Director of the National Science Foundation

record-level data collected under paragraph (1) in the form required by such Director.

(B) PREVIOUS DATA.—As part of the first submission under subparagraph (A), each Federal science agency, to the extent practicable, shall also submit comparable record-level data for the 5 years preceding the date of such submission.

(b) REPORTING OF DATA.—The Director of the National Science Foundation shall publish statistical summary data collected under this section, disaggregated and cross-tabulated by race, ethnicity, gender, age, and years since completion of doctoral degree, including in conjunction with the National Science Foundation's report required by section 37 of the Science and Technology Equal Opportunities Act (42 U.S.C. 1885d; Public Law 96–516).

SEC. 5. POLICIES FOR REVIEW OF FEDERAL RESEARCH GRANTS.

(a) IN GENERAL.—Each Federal science agency shall implement the policy recommendations with respect to reducing the impact of implicit bias at Federal science agencies and grantee institutions as developed by the Office of Science and Technology Policy in the 2016 report enti-

tled "Reducing the Impact of Bias in the STEM Workforce" and any subsequent updates.

(b) PILOT ACTIVITY.—In consultation with the National Science Foundation and consistent with policy recommendations referenced in subsection (a), each Federal science agency shall implement a 2-year pilot orientation activity for program officers and members of standing review committees to educate reviewers on, and minimize the effects of, implicit bias in the review of extramural and intramural Federal research grants.

(c) ESTABLISHMENT OF POLICIES.—Drawing upon lessons learned from the pilot activity under subsection (b), each Federal science agency shall maintain or develop and implement policies and practices to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants.

(d) ASSESSMENT OF POLICIES.—Federal science agencies shall regularly assess, and amend as necessary, the policies and practices implemented pursuant to subsection (c) to ensure effective measures are in place to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants.

SEC. 6. COLLECTION OF DATA ON DEMOGRAPHICS OF FACULTY.

(a) COLLECTION OF DATA.—

(1) IN GENERAL.—Not later than 3 years after the date of enactment of this Act, and at least every 5 years thereafter, the Director of the National Science Foundation shall carry out a survey to collect institution-level data on the demographics of STEM faculty, by broad fields of STEM, at different types of institutions of higher education.

(2) CONSIDERATIONS.—To the extent practicable, the Director of the National Science Foundation shall consider, by gender, race, ethnicity, citizenship status, age, and years since completion of doctoral degree—

(A) the number and percentage of faculty;

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

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

(D) the number and percentage of faculty who are reviewed for promotion, including tenure, and the percentage of that number who are promoted, including being awarded tenure;

(E) faculty years in rank;

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

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

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

(b) EXISTING SURVEYS.—The Director of the National Science Foundation, may, in modifying or expanding existing Federal surveys of higher education (as necessary)—

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

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

(c) REPORTING DATA.—The Director of the National Science Foundation shall publish statistical summary data collected under this section, including as part of the National Science Foundation's report required by section 37 of the Science and Technology Equal Opportunities Act (42 U.S.C. 1885d; Public Law 96–516).

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation $3,000,000 in each of fiscal years 2020 through 2022 to develop and carry out the initial survey required under subsection (a).

SEC. 7. CULTURAL AND INSTITUTIONAL BARRIERS TO EXPANDING THE ACADEMIC AND FEDERAL STEM WORKFORCE.

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

(1) DEVELOPMENT OF GUIDANCE.—Not later than 12 months after the date of enactment of this Act, the Director shall develop written guidance for institutions of higher education and Federal laboratories on the best practices for—

(A) conducting periodic climate surveys of STEM departments and divisions, with a particular focus on identifying any cultural or institutional barriers to the recruitment, retention, or advancement of women, racial and ethnic minorities, and other groups historically underrepresented in STEM studies and careers; and

(B) providing educational opportunities, including workshops as described in subsection (b), for STEM faculty, research personnel, and administrators to learn about current research on implicit bias in recruitment, evaluation, and promotion of undergraduate and graduate students and research personnel.

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

(3) DISSEMINATION OF GUIDANCE.—Federal science agencies shall broadly disseminate the guidance developed under paragraph (1) to institutions of higher education that receive Federal research funding and Federal laboratories.

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

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

(i) applies to, at a minimum, each institution classified under the Indiana University Center for Postsecondary Research Carnegie Classification as a doctorate-granting university with a very high level of research activity; and

(ii) requires each such institution, not later than 3 years after the date of enactment of this Act, to report to the Director of the National Science Foundation on activities and policies developed and imple-

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

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

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

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Director, in consultation with the interagency working group on inclusion in STEM, shall recommend a uniform policy for Federal science agencies to carry out a program of workshops that educate STEM department chairs at institutions of higher education, senior managers at Federal laboratories, and other federally funded researchers about methods that minimize the effects of implicit bias in the career advancement, including hiring, tenure, promotion, and selection for any honor based in part on the recipient's research record, of academic and Federal STEM researchers.

(2) INTERAGENCY COORDINATION.—The Director shall ensure that workshops supported under this subsection are coordinated across Federal science agencies and jointly supported as appropriate.

(3) MINIMIZING COSTS.—To the extent practicable, workshops shall be held in conjunction with national or regional STEM disciplinary meetings to minimize costs associated with participant travel.

(4) PRIORITY FIELDS FOR ACADEMIC PARTICIPANTS.—In considering the participation of STEM department chairs and other academic researchers, the Director shall prioritize workshops for the broad fields of STEM in which the national rate of representation of women among tenured or tenure-track faculty or nonfaculty researchers at doctorate-granting institutions of higher education is less than 25 percent, according to the most recent data available from the National Center for Science and Engineering Statistics.

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

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

(B) Nonprofit organizations that have the primary mission of advancing the participation of women, minorities, or other groups historically underrepresented in STEM.

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

(A) Invitees to workshops shall include at least—

(i) the chairs of departments in the relevant STEM discipline or disciplines from at least the top 50 institutions of higher education, as determined by the amount of Federal research and development funds obligated to each institution of higher education in the prior year based on data available from the National Science Foundation; and

(ii) in the case of Federal laboratories, individuals with personnel management responsibilities comparable to those of an institution of higher education department chair.

(B) Activities at the workshops shall include research presentations and interactive discussions or other activities that increase the awareness of the existence of implicit bias in recruitment, hiring, tenure review, promotion, and other forms of formal recognition of individual achievement for faculty and other federally funded STEM researchers and shall provide strategies to overcome such bias.

(C) Research presentations and other workshop programs, as appropriate, shall include a discussion of the unique challenges faced by different underrepresented groups, including minority women, minority men, persons from rural and underserved areas, persons with disabilities, and first generation graduates in research.

(D) Workshop programs shall include information on best practices for mentoring undergraduate and graduate women, minorities, and other students from groups historically underrepresented in STEM.

(7) DATA ON WORKSHOPS.—Any proposal for funding by an organization seeking to carry out a

workshop under this subsection shall include a description of how such organization will—

(A) collect data on the rates of attendance by invitees in workshops, including information on the home institution and department of attendees, and the rank of faculty attendees;

(B) conduct attitudinal surveys on workshop attendees before and after the workshops; and

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

(8) REPORT TO NSF.—Organizations receiving funding to carry out workshops under this subsection shall report the data required in paragraph (7) to the Director of the National Science Foundation in such form as required by such Director.

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

(1) a summary and analysis of the types and frequency of activities and policies developed and carried out under subsection (a) based on the re-

ports submitted under paragraph (4) of such subsection; and

(2) a description and evaluation of the status and effectiveness of the program of workshops required under subsection (c), including a summary of any data reported under paragraph (8) of such subsection.

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

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

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

(1) research grants to analyze the record-level data collected under section 4 and section 6, consistent with policies to ensure the privacy of individuals identifiable by such data;

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

(3) research grants to study the impact of policies and practices that are implemented under this

Act or that are otherwise consistent with the purposes of this Act;

(4) collaboration with other Federal science agencies and professional associations to exchange best practices, harmonize work-life accommodation policies and practices, and overcome common barriers to work-life accommodation;

(5) collaboration with institutions of higher education in order to clarify and catalyze the adoption of a coherent and consistent set of work-life accommodation policies and practices; and

(6) research grants to study the use of standardized graduate student admission exams and its impact on the recruitment, retention, and success of women, underrepresented minorities, persons from rural areas, persons with disabilities, and first generation graduates in graduate STEM degree programs.

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

SEC. 9. RESEARCH AND RELATED ACTIVITIES TO EXPAND STEM OPPORTUNITIES.

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

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

(2) by inserting after subsection (d) the following:

"(e) SUPPORT FOR INCREASING DIVERSITY AMONG STEM FACULTY AT INSTITUTIONS OF HIGHER EDUCATION.—

"(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or consortia thereof) for the development and assessment of innovative reform efforts designed to increase the recruitment, retention, and advancement of individuals from underrepresented minority groups in academic STEM careers.

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

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

"(A) institutional assessment activities, such as data analyses and policy review, in order to identify and address specific issues in the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

"(B) implementation of institution-wide improvements in workload distribution, such that faculty members from underrepresented minority groups are not disadvantaged in the amount of time available to focus on research, publishing papers, and engaging in other activities required to achieve tenure status and run a productive research program;

"(C) development and implementation of training courses for administrators and search committee members to ensure that candidates from underrepresented minority groups are not subject to implicit biases in the search and hiring process;

"(D) development and hosting of intra- or inter-institutional workshops to propagate best practices in recruiting, retaining, and advancing faculty members from underrepresented minority groups;

"(E) professional development opportunities for faculty members from underrepresented minority groups;

"(F) activities aimed at making undergraduate STEM students from underrepresented minority groups aware of opportunities for academic careers in STEM fields;

"(G) activities to identify and engage exceptional graduate students from underrepresented minority groups at various stages of their studies and to encourage them to enter academic careers; and

"(H) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

"(4) SELECTION PROCESS.—

"(A) APPLICATION.—An institution of higher education (or a consortium of such institutions) seeking funding under this subsection shall submit an application to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum, a description of—

"(i) the reform effort that is being proposed for implementation by the institution of higher education;

"(ii) any available evidence of specific difficulties in the recruitment, retention, and advancement of faculty members from underrepresented minority groups in STEM academic careers within the institution of higher education submitting an application, and how the proposed reform effort would address such issues;

"(iii) how the institution of higher education submitting an application plans to sustain the proposed reform effort beyond the duration of the grant; and

"(iv) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to the national knowledge base about models for catalyzing institutional change.

"(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection, the Director of the Foundation shall consider, at a minimum—

"(i) the likelihood of success in undertaking the proposed reform effort at the institution of higher education submitting the application, including the extent to which the administrators of the institution are committed to making the proposed reform effort a priority;

"(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is placed on the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

"(iii) the likelihood that the institution of higher education will sustain or expand the proposed reform effort beyond the period of the grant; and

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

"(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent practicable, that grants awarded under this sec-

tion are made to a variety of types of institutions of higher education.

"(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this subsection $8,000,000 for each of fiscal years 2020 through 2024.".

(b) NATIONAL SCIENCE FOUNDATION SUPPORT FOR BROADENING PARTICIPATION IN UNDERGRADUATE STEM EDUCATION.—Section 305 of the American Innovation and Competitiveness Act (42 U.S.C. 1862s–5), as amended by subsection (b), is further amended by inserting after subsection (e) the following:

"(f) SUPPORT FOR BROADENING PARTICIPATION IN UNDERGRADUATE STEM EDUCATION.—

"(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or a consortium of such institutions) to implement or expand research-based reforms in undergraduate STEM education for the purpose of recruiting and retaining students from minority groups who are underrepresented in STEM fields.

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

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

"(A) implementation or expansion of innovative, research-based approaches to broaden participation of underrepresented minority groups in STEM fields;

"(B) implementation or expansion of bridge, cohort, tutoring, or mentoring programs designed to enhance the recruitment and retention of students from underrepresented minority groups in STEM fields;

"(C) implementation or expansion of outreach programs linking institutions of higher education and K–12 school systems in order to heighten awareness among pre-college students from underrepresented minority groups of opportunities in college-level STEM fields and STEM careers;

"(D) implementation or expansion of faculty development programs focused on improving retention of undergraduate STEM students from underrepresented minority groups;

"(E) implementation or expansion of mechanisms designed to recognize and reward faculty members who demonstrate a commit-

ment to increasing the participation of students from underrepresented minority groups in STEM fields;

"(F) expansion of successful reforms aimed at increasing the number of STEM students from underrepresented minority groups beyond a single course or group of courses to achieve reform within an entire academic unit, or expansion of successful reform efforts beyond a single academic unit to other STEM academic units within an institution of higher education;

"(G) expansion of opportunities for students from underrepresented minority groups to conduct STEM research in industry, at Federal labs, and at international research institutions or research sites;

"(H) provision of stipends for students from underrepresented minority groups participating in research;

"(I) development of research collaborations between research-intensive universities and primarily undergraduate minority-serving institutions;

"(J) support for graduate students and postdoctoral fellows from underrepresented mi-

nority groups to participate in instructional or assessment activities at primarily undergraduate institutions, including primarily undergraduate minority-serving institutions and two-year institutions of higher education; and

"(K) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

"(4) SELECTION PROCESS.—

"(A) APPLICATION.—An institution of higher education (or a consortia thereof) seeking a grant under this subsection shall submit an application to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum—

"(i) a description of the proposed reform effort;

"(ii) a description of the research findings that will serve as the basis for the proposed reform effort or, in the case of applications that propose an expansion of a previously implemented reform, a description of the previously implemented reform

effort, including data about the recruitment, retention, and academic achievement of students from underrepresented minority groups;

"(iii) evidence of an institutional commitment to, and support for, the proposed reform effort, including a long-term commitment to implement successful strategies from the current reform beyond the academic unit or units included in the grant proposal;

"(iv) a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching assignment that reward faculty contributions to improving the education of students from underrepresented minority groups in STEM; and

"(v) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to the national knowledge base about models for catalyzing institutional change.

"(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection,

the Director of the Foundation shall consider, at a minimum—

"(i) the likelihood of success of the proposed reform effort at the institution submitting the application, including the extent to which the faculty, staff, and administrators of the institution are committed to making the proposed institutional reform a priority of the participating academic unit or units;

"(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is placed on faculty engagement in the retention of students from underrepresented minority groups;

"(iii) the likelihood that the institution will sustain or expand the proposed reform effort beyond the period of the grant; and

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

"(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent

practicable, that grants awarded under this subsection are made to a variety of types of institutions of higher education, including two-year and minority-serving institutions of higher education.

"(5) EDUCATION RESEARCH.—

"(A) IN GENERAL.—All grants made under this subsection shall include an education research component that will support the design and implementation of a system for data collection and evaluation of proposed reform efforts in order to build the knowledge base on promising models for increasing recruitment and retention of students from underrepresented minority groups in STEM education at the undergraduate level across a diverse set of institutions.

"(B) DISSEMINATION.—The Director of the Foundation shall coordinate with relevant Federal agencies in disseminating the results of the research under this paragraph to ensure that best practices in broadening participation in STEM education at the undergraduate level are made readily available to all institutions of higher education, other Federal agencies that

support STEM programs, non-Federal funders of STEM education, and the general public.

"(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this subsection $15,000,000 for each of fiscal years 2020 through 2024.".

SEC. 10. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.

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

"(d) GRANTS TO BROADEN TRIBAL COLLEGE AND UNIVERSITY STUDENT PARTICIPATION IN COMPUTER SCIENCE.—

"(1) IN GENERAL.—The Director, as part of the program authorized under this section, shall award grants on a competitive, merit-reviewed basis to eligible entities to increase the participation of tribal populations in computer science and computational thinking education programs to enable students to develop skills and competencies in coding, problem-solving, critical thinking, creativity and collaboration.

"(2) PURPOSE.—Grants awarded under this subsection shall support—

"(A) research and development needed to bring computer science and computational thinking courses and degrees to tribal colleges and universities;

"(B) research and development of instructional materials needed to integrate computer science and computational thinking into programs that are culturally relevant to students attending tribal colleges and universities;

"(C) research, development and evaluation of distance education for computer science and computational thinking courses and degree programs for students attending tribal colleges and universities; and

"(D) other activities consistent with the activities described in paragraphs (1) through (4) of subsection (b), as determined by the Director.

"(3) PARTNERSHIPS.—A tribal college or university seeking a grant under this subsection, or a consortia thereof, may partner with an institution of higher education or nonprofit organization with dem-

onstrated expertise in academic program development.

"(4) COORDINATION.—In carrying out this subsection, the Director shall consult and cooperate with the programs and policies of other relevant Federal agencies to avoid duplication with and enhance the effectiveness of the program under this subsection.

"(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the Foundation $2,000,000 in each of fiscal years 2020 through 2024 to carry out this subsection.".

(b) EVALUATION.—

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

(2) REQUIREMENTS.—In conducting the evaluation under paragraph (1), the Director shall—

(A) use a common set of benchmarks and assessment tools to identify best practices and materials developed or demonstrated by the re-

search conducted pursuant to grants programs under section 525 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. 1862p–13);

(B) include an assessment of the effectiveness of such grant programs in expanding access to high quality STEM education, research, and outreach at tribal colleges and universities, as applicable;

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

(D) assess the percentage of students participating in such grant programs who successfully complete their education programs.

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

SEC. 11. REPORT TO CONGRESS.

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

(1) a description and evaluation of the status and usage of policies implemented pursuant to section 3 at all Federal science agencies, including any recommendations for revising or expanding such policies;

(2) with respect to efforts to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants under section 5—

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

(B) a description of any significant updates to the policies for review of Federal research grants required under such section; and

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

(3) a description and evaluation of the status of institution of higher education and Federal laboratory policies and practices required under section

7(a), including any recommendations for revising or expanding such policies.

SEC. 12. MERIT REVIEW.

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

SEC. 13. DEFINITIONS.

In this Act:

(1) DIRECTOR.—The term "Director" means the Director of the Office of Science and Technology Policy.

(2) FEDERAL LABORATORY.—The term "Federal laboratory" has the meaning given such term in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703).

(3) FEDERAL SCIENCE AGENCY.—The term "Federal science agency" means any Federal agency with at least $100,000,000 in research and development expenditures in fiscal year 2018.

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

(5) INTERAGENCY WORKING GROUP ON INCLUSION IN STEM.—The term "interagency working

group on inclusion in STEM" means the interagency working group established by section 308 of the American Innovation and Competitiveness Act (42 U.S.C. 6626).

(6) STEM.—The term "STEM" means science, technology, engineering, and mathematics, including computer science.

○

Chairman JOHNSON. Without objection, the bill is considered as read and open to amendment at any point.

I recognize myself for a comment on the bill.

For decades, the scientific enterprise has been the very envy of the world. Our success has been driven by investments in people and STEM students and blue-collar STEM workers, and in scientists and engineers. We've managed so far with a STEM workforce that does not represent the diversity of the Nation.

However, we cannot afford to rest on our laurels. With intensifying global competition in urgent environmental, societal, and technological challenges before us, we must do more to ensure that we are bringing all of our brain power and talent to bear. Unfortunately, research shows that discrimination, harassment, bias, hostile work cultures, and institutional barriers are pushing scores of talented people to abandon their STEM studies and careers.

I'm pleased to be joined by my good friend, Ranking Member Lucas, earlier this year introducing H.R. 2528, *STEM Opportunities Act of 2019*. The *STEM Opportunities Act* supports research, data collection, and evidence-based interventions to identify and lower barriers to recruitment, retention, and advancement of women and underrepresented minorities in STEM education and research careers.

The bill also directs the Office of Science and Technology Policy—excuse me—to develop consistent guidelines for Federal science agencies on providing caregiving accommodations—thank you—reducing the impact of implicit bias and best practices for assessing organizational culture.

In 2017, the National Academies published a report "Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering." The recommendations in that report became the basis for the very first version of this bill.

Today's bill includes many updates and improvements based on the recommendations we've received since that time. If we are to lead the world in meeting the challenges of the 21st century, we need all of our brightest minds at the table. This can only happen with meaningful and lasting cultural change. H.R. 2528 is an important step in that direction, and I urge my colleagues to support it.

Does anyone else wish to be recognized? Ms. Bonamici.

Ms. BONAMICI. Chairwoman Johnson, thank you. I move to strike the last word.

Chairwoman JOHNSON. The gentlelady is recognized.

Ms. BONAMICI. Thank you, Chairwoman. Our Committee's work today is an important step to address the underrepresentation of women and people of color in STEM fields, and I strongly support the *STEM Opportunities Act*. I'm grateful to Chairwoman Johnson and Ranking Member Lucas for their leadership on this bill.

The *STEM Opportunities Act* would improve our understanding of the persistent biases and barriers that exist for increasing the diversity of the STEM workforce. The bill would direct Federal science agencies to collect comprehensive demographic data on the recipients of Federal research awards and STEM faculty at universities. It would require the Office of Science and Technology Policy to develop Federal guidelines to improve the recruitment, reten-

tion, and advancement of women and underrepresented populations in STEM research careers.

But the development and diversification of the STEM pipeline must begin in our Nation's K–12 schools. As a Member of the Education and Labor Committee and the Founder and Co-Chair of the congressional STEAM Caucus, I continue to advocate for the integration of art and design into STEM fields. STEAM education can build more inclusive classroom environments that support greater diversity of students interested in STEM, especially girls and people of color. STEAM education recognizes the benefits of both the arts and sciences and their intersections to our country's future.

Our future will require innovation, creative ideas, and new ways to solve problems, all of which are bolstered by educating the whole brain. And research shows that students are more engaged in the classroom when arts, music, and other creative outlets are included in instruction.

There are two nationally recognized STEAM schools in the district I represent in northwest Oregon, and I have seen firsthand the power of these programs to engage all students in STEM.

Earlier this week, I introduced the bipartisan *Building STEAM Education Act of 2019* with Representatives Langevin and Stefanik to expand resources and grant opportunities that support STEAM education programs. Notably, this bill would require the STEM Education Advisory Panel, which brings together leaders from the National Science Foundation, Department of Education, NASA (National Aeronautics and Space Administration), and NOAA (National Oceanic and Atmospheric Administration) to consider ways to integrate art and design into STEM education programs. It would also promote creativity and innovation by expanding resources through the National Science Foundation's Math and Science Partnership grant program to include the development of STEM education curricula that incorporate art and design.

I hope that in addition to advancing the *STEM Opportunities Act* I can work with the Chairwoman, Ranking Member, and my colleagues on this Committee to make sure that all students, including girls and students of color, have the creative and critical thinking skills they will need to solve 21st-century problems through increased STEAM education.

I thank the Chairwoman for the time and her leadership on this important issue. I urge my colleagues to support the *STEM Opportunities Act,* and I yield back the balance of my time.

Chairwoman JOHNSON. Thank you very much.

Are there any other comments?

We now will proceed with the amendments in the order on the roster.

The first amendment on the roster is an amendment in the nature of a substitute offered by the Chair, and the clerk will report the amendment.

The CLERK. Amendment number 1, amendment in the nature——

[The amendment of Chairwoman Johnson follows:]

AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. 2528

OFFERED BY Ms. Johnson

Strike all after the enacting clause and insert the following:

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

(a) SHORT TITLE.—This Act may be cited as the "STEM Opportunities Act of 2019".

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

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

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

(2) Research shows that women and minorities who are interested in STEM careers are disproportionately lost at nearly every educational transition and at every career milestone.

(3) The National Center for Science and Engineering Statistics at the National Science Foundation collects, compiles, analyzes, and publishes data on the demographics of STEM degrees and STEM jobs in the United States.

(4) Women now earn nearly 37 percent of all STEM bachelor's degrees, but major variations persist among fields. In 2017, women earned only 20 percent of all bachelor's degrees awarded in engineering and 19 percent of bachelor's degrees awarded in computer sciences. Based on Bureau of Labor Statistics data, jobs in computing occupations are expected to account for nearly 60 percent of the projected annual growth of newly created STEM job openings from 2016 to 2026.

(5) In 2017, underrepresented minority groups comprised 39 percent of the college-age population of the United States, but only 18 percent of students who earned bachelor's degrees in STEM fields. The Higher Education Research Institute at the University of California, Los Angeles, found that,

while freshmen from underrepresented minority groups express an interest in pursuing a STEM undergraduate degree at the same rate as all other freshmen, only 22.1 percent of Latino students, 18.4 percent of African-American students, and 18.8 percent of Native American students studying in STEM fields complete their degree within 5 years, compared to approximately 33 percent of White students and 42 percent of Asian students who complete their degree within 5 years.

(6) In some STEM fields, including the computer sciences, women persist at about the same rate through doctorate degrees. In other STEM fields, women persist through doctorate degrees at a lower rate. In mathematics, women earn just 26 percent of doctorate degrees compared with 42 percent of undergraduate degrees. Overall, women earned 38 percent of STEM doctorate degrees in 2016. The rate of minority students earning STEM doctorate degrees in physics is 9 percent, compared with 15 percent for bachelor's degree. Students from underrepresented minority groups accounted for only 11.5 percent of STEM doctorate degrees awarded in 2016.

(7) The representation of women in STEM drops significantly from the doctorate degree level to the faculty level. Overall, women hold only 26 percent of all tenured and tenure-track positions and 27 percent of full professor positions in STEM fields in our Nation's universities and 4-year colleges. Black and Hispanic faculty together hold about 6.8 percent of all tenured and tenure-track positions and 7.5 percent of full professor positions. Many of the numbers in the American Indian or Alaskan Native and Native Hawaiian or Other Pacific Islander categories for different faculty ranks were too small for the National Science Foundation to report publicly without potentially compromising confidential information about the individuals being surveyed.

(8) The representation of women is especially low at our Nation's top research universities. Even in the biological sciences, in which women now earn more than 50 percent of the doctorates and passed the 25 percent level 37 years ago, women make up only 25 percent of the full professors at the approximately 100 most research-intensive universities in the United States. In the physical sciences and mathematics, women make up only 11 percent of full professors, in computer sciences only 10 percent,

and across engineering fields only 7 percent. The data suggest that approximately 6 percent of all tenure-track STEM faculty members at the most research-intensive universities are from underrepresented minority groups, but in some fields the numbers are too small to report publicly.

(9) By 2050, underrepresented minorities will comprise 52 percent of the college-age population of the United States. If the percentage of female students and students from underrepresented minority groups earning bachelor's degrees in STEM fields does not significantly increase, the United States will face an acute shortfall in the overall number of students who earn degrees in STEM fields just as United States companies are increasingly seeking students with those skills. With this impending shortfall, the United States will almost certainly lose its competitive edge in the 21st century global economy.

(10) According to a 2014 Association for Women in Science survey of over 4,000 scientists across the globe, 70 percent of whom were men, STEM researchers face significant challenges in work-life integration. Researchers in the United States were among the most likely to experience a

conflict between work and their personal life at least weekly. One-third of researchers surveyed said that ensuring good work-life integration has negatively impacted their careers, and, of researchers intending to leave their current job within the next year, 9 percent indicated it was because they were unable to balance work and life demands.

(11) Female students and students from underrepresented minority groups at institutions of higher education who see few others "like themselves" among faculty and student populations often do not experience the social integration that is necessary for success in all disciplines, including STEM.

(12) One in five children in the United States attend school in a rural community. The data shows that rural students are at a disadvantage with respect to STEM readiness. Among STEM-interested students, 17 percent of students in rural high schools and 18 percent of students in town-located high schools meet the ACT STEM Benchmark, compared with 33 percent of students in suburban high schools and 27 percent of students in urban high schools.

(13) A substantial body of evidence establishes that most people hold implicit biases. Decades of

cognitive psychology research reveal that most people carry prejudices of which they are unaware but that nonetheless play a large role in evaluations of people and their work. Unintentional biases and outmoded institutional structures are hindering the access and advancement of women, minorities, and other groups historically underrepresented in STEM.

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

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

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

(B) provides guidance that is usable by all institutions of higher education receiving significant Federal research funding on how to conduct meaningful self-evaluations of campus culture and policies.

(16) The Federal Government provides 55 percent of research funding at institutions of higher

education and, through its grant-making policies, has had significant influence on institution of higher education policies, including policies related to institutional culture and structure.

SEC. 2. PURPOSES.

The purposes of this Act are as follows:

(1) To ensure that Federal science agencies and institutions of higher education receiving Federal research and development funding are fully engaging the entire talent pool of the United States.

(2) To promote research on, and increase understanding of, the participation and trajectories of women, minorities, and other groups historically underrepresented in STEM studies and careers, including persons with disabilities, older learners, veterans, and rural, poor, and tribal populations, at institutions of higher education and Federal science agencies, including Federal laboratories.

(3) To raise awareness within Federal science agencies, including Federal laboratories, and institutions of higher education about cultural and institutional barriers limiting the recruitment, retention, promotion, and other indicators of participation and achievement of women, minorities, and other groups

historically underrepresented in academic and Government STEM research careers at all levels.

(4) To identify, disseminate, and implement best practices at Federal science agencies, including Federal laboratories, and at institutions of higher education to remove or reduce cultural and institutional barriers limiting the recruitment, retention, and success of women, minorities, and other groups historically underrepresented in academic and Government STEM research careers.

(5) To provide grants to institutions of higher education to recruit, retain, and advance STEM faculty members from underrepresented minority groups and to implement or expand reforms in undergraduate STEM education in order to increase the number of students from underrepresented minority groups receiving degrees in these fields.

SEC. 3. FEDERAL SCIENCE AGENCY POLICIES FOR CAREGIVERS.

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

(1) apply to all—

(A) research awards granted by such agency; and

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

(2) provide—

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

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

(C) grant supplements, as appropriate, to research awards for research technicians or equivalent positions to sustain research activities conducted under such awards; and

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

(b) UNIFORMITY OF GUIDANCE.—In providing guidance under subsection (a), the Director shall encourage uniformity and consistency in the policies established pursuant to such guidance across all Federal science agencies.

(c) ESTABLISHMENT OF POLICIES.—Consistent with the guidance under subsection (a), Federal science agencies shall—

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

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

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

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

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

SEC. 4. COLLECTION AND REPORTING OF DATA ON FEDERAL RESEARCH GRANTS.

(a) COLLECTION OF DATA.—

(1) IN GENERAL.—Each Federal science agency shall collect, as practicable, with respect to all applications for merit-reviewed research and development grants to institutions of higher education and Federal laboratories supported by that agency, the standardized record-level annual information on demographics, primary field, award type, institution

type, review rating, budget request, funding outcome, and awarded budget.

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

(3) RECORD-LEVEL DATA.—

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

(B) PREVIOUS DATA.—As part of the first submission under subparagraph (A), each Federal science agency, to the extent practicable, shall also submit comparable record-level data for the 5 years preceding the date of such submission.

(b) REPORTING OF DATA.—The Director of the National Science Foundation shall publish statistical summary data, as practicable, collected under this section, disaggregated and cross-tabulated by race, ethnicity, gen-

der, and years since completion of doctoral degree, including in conjunction with the National Science Foundation's report required by section 37 of the Science and Technology Equal Opportunities Act (42 U.S.C. 1885d; Public Law 96–516).

SEC. 5. POLICIES FOR REVIEW OF FEDERAL RESEARCH GRANTS.

(a) IN GENERAL.—Each Federal science agency shall implement the policy recommendations with respect to reducing the impact of implicit bias at Federal science agencies and grantee institutions as developed by the Office of Science and Technology Policy in the 2016 report entitled "Reducing the Impact of Bias in the STEM Workforce" and any subsequent updates.

(b) PILOT ACTIVITY.—In consultation with the National Science Foundation and consistent with policy recommendations referenced in subsection (a), each Federal science agency shall implement a 2-year pilot orientation activity for program officers and members of standing review committees to educate reviewers on research related to, and minimize the effects of, implicit bias in the review of extramural and intramural Federal research grants.

(c) ESTABLISHMENT OF POLICIES.—Drawing upon lessons learned from the pilot activity under subsection (b), each Federal science agency shall maintain or develop

and implement evidence-based policies and practices to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants.

(d) ASSESSMENT OF POLICIES.—Federal science agencies shall regularly assess, and amend as necessary, the policies and practices implemented pursuant to subsection (c) to ensure effective measures are in place to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants.

SEC. 6. COLLECTION OF DATA ON DEMOGRAPHICS OF FACULTY.

(a) COLLECTION OF DATA.—

(1) IN GENERAL.—Not later than 3 years after the date of enactment of this Act, and at least every 5 years thereafter, the Director of the National Science Foundation shall carry out a survey to collect data from grantees on the demographics of STEM faculty, by broad fields of STEM, at different types of institutions of higher education.

(2) CONSIDERATIONS.—To the extent practicable, the Director of the National Science Foundation shall consider, by gender, race, ethnicity, citizenship status, and years since completion of doctoral degree—

(A) the number and percentage of faculty;

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

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

(D) the number and percentage of faculty who are reviewed for promotion, including tenure, and the percentage of that number who are promoted, including being awarded tenure;

(E) faculty years in rank;

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

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

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

(b) EXISTING SURVEYS.—The Director of the National Science Foundation, may, in modifying or expanding existing Federal surveys of higher education (as necessary)—

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

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

(c) REPORTING DATA.—The Director of the National Science Foundation shall publish statistical summary data collected under this section, including as part of the National Science Foundation's report required by section 37 of the Science and Technology Equal Opportunities Act (42 U.S.C. 1885d; Public Law 96–516).

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation $3,000,000 in each of fiscal years 2020 through 2022 to develop and carry out the initial survey required under subsection (a).

SEC. 7. CULTURAL AND INSTITUTIONAL BARRIERS TO EXPANDING THE ACADEMIC AND FEDERAL STEM WORKFORCE.

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

(1) DEVELOPMENT OF GUIDANCE.—Not later than 12 months after the date of enactment of this Act, the Director, in consultation with the interagency working group on inclusion in STEM, shall develop written guidance for institutions of higher

education and Federal laboratories on the best practices for—

(A) conducting periodic climate surveys of STEM departments and divisions, with a particular focus on identifying any cultural or institutional barriers to the recruitment, retention, or advancement of women, racial and ethnic minorities, and other groups historically underrepresented in STEM studies and careers; and

(B) providing educational opportunities, including workshops as described in subsection (b), for STEM faculty, research personnel, and administrators to learn about current research on implicit bias in recruitment, evaluation, and promotion of undergraduate and graduate students and research personnel.

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

(3) DISSEMINATION OF GUIDANCE.—Federal science agencies shall broadly disseminate the guidance developed under paragraph (1) to institutions

of higher education that receive Federal research funding and Federal laboratories.

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

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

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

(ii) requires each such institution, not later than 3 years after the date of enactment of this Act, to report to the Director of the National Science Foundation on activities and policies developed and implemented based on the guidance developed under paragraph (1); and

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

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

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Director, in consultation with the interagency working group on inclusion in STEM, shall recommend a uniform policy for Federal science agencies to carry out a program of workshops that educate STEM department chairs at institutions of higher education, senior managers at Federal laboratories, and other federally funded researchers about methods that minimize the effects of implicit bias in the career advancement, including hiring, tenure, promotion, and selection for any honor based in part on the recipient's research record, of academic and Federal STEM researchers.

(2) INTERAGENCY COORDINATION.—The Director shall, to the extent practicable, ensure that workshops supported under this subsection are coordinated across Federal science agencies and jointly supported as appropriate.

(3) MINIMIZING COSTS.—To the extent practicable, workshops shall be held in conjunction with national or regional STEM disciplinary meetings to minimize costs associated with participant travel.

(4) PRIORITY FIELDS FOR ACADEMIC PARTICIPANTS.—In considering the participation of STEM

department chairs and other academic researchers, the Director shall prioritize workshops for the broad fields of STEM in which the national rate of representation of women among tenured or tenure-track faculty or nonfaculty researchers at doctorate-granting institutions of higher education is less than 25 percent, according to the most recent data available from the National Center for Science and Engineering Statistics.

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

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

(B) Nonprofit organizations that have the primary mission of advancing the participation of women, minorities, or other groups historically underrepresented in STEM.

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

(A) Invitees to workshops shall include at least—

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

(ii) in the case of Federal laboratories, individuals with personnel management responsibilities comparable to those of an institution of higher education department chair.

(B) Activities at the workshops shall include research presentations and interactive discussions or other activities that increase the awareness of the existence of implicit bias in recruitment, hiring, tenure review, promotion, and other forms of formal recognition of individual achievement for faculty and other federally funded STEM researchers and shall provide strategies to overcome such bias.

(C) Research presentations and other workshop programs, as appropriate, shall include a discussion of the unique challenges faced by different underrepresented groups, including minority women, minority men, persons

from rural and underserved areas, persons with disabilities, gender and sexual minority individuals, and first generation graduates in research.

(D) Workshop programs shall include information on best practices for mentoring undergraduate and graduate women, minorities, and other students from groups historically underrepresented in STEM.

(7) DATA ON WORKSHOPS.—Any proposal for funding by an organization seeking to carry out a workshop under this subsection shall include a description of how such organization will—

(A) collect data on the rates of attendance by invitees in workshops, including information on the home institution and department of attendees, and the rank of faculty attendees;

(B) conduct attitudinal surveys on workshop attendees before and after the workshops; and

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

(8) REPORT TO NSF.—Organizations receiving funding to carry out workshops under this sub-

section shall report the data required in paragraph (7) to the Director of the National Science Foundation in such form as required by such Director.

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

(1) a summary and analysis of the types and frequency of activities and policies developed and carried out under subsection (a) based on the reports submitted under paragraph (4) of such subsection; and

(2) a description and evaluation of the status and effectiveness of the program of workshops required under subsection (b), including a summary of any data reported under paragraph (8) of such subsection.

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

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

(a) IN GENERAL.—The Director of the National Science Foundation shall award research grants and carry

out dissemination activities consistent with the purposes of this Act, including—

(1) research grants to analyze the record-level data collected under section 4 and section 6, consistent with policies to ensure the privacy of individuals identifiable by such data;

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

(3) research grants to study the impact of policies and practices that are implemented under this Act or that are otherwise consistent with the purposes of this Act;

(4) collaboration with other Federal science agencies and professional associations to exchange best practices, harmonize work-life accommodation policies and practices, and overcome common barriers to work-life accommodation; and

(5) collaboration with institutions of higher education in order to clarify and catalyze the adoption of a coherent and consistent set of work-life accommodation policies and practices.

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

SEC. 9. RESEARCH AND RELATED ACTIVITIES TO EXPAND STEM OPPORTUNITIES.

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

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

(2) by inserting after subsection (d) the following:

"(e) SUPPORT FOR INCREASING DIVERSITY AMONG STEM FACULTY AT INSTITUTIONS OF HIGHER EDUCATION.—

"(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or consortia thereof) for the development and assessment of innovative reform efforts designed to increase the recruitment, retention, and advancement of individuals from underrepresented minority groups in academic STEM careers.

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

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

"(A) institutional assessment activities, such as data analyses and policy review, in order to identify and address specific issues in the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

"(B) implementation of institution-wide improvements in workload distribution, such that faculty members from underrepresented minority groups are not disadvantaged in the amount of time available to focus on research, publishing papers, and engaging in other activities required to achieve tenure status and run a productive research program;

"(C) development and implementation of training courses for administrators and search committee members to ensure that candidates from underrepresented minority groups are not subject to implicit biases in the search and hiring process;

"(D) development and hosting of intra- or inter-institutional workshops to propagate best practices in recruiting, retaining, and advancing faculty members from underrepresented minority groups;

"(E) professional development opportunities for faculty members from underrepresented minority groups;

"(F) activities aimed at making undergraduate STEM students from underrepresented minority groups aware of opportunities for academic careers in STEM fields;

"(G) activities to identify and engage exceptional graduate students from underrepresented minority groups at various stages of their studies and to encourage them to enter academic careers; and

"(H) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

"(4) SELECTION PROCESS.—

"(A) APPLICATION.—An institution of higher education (or a consortium of such institutions) seeking funding under this subsection shall submit an application to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum, a description of—

"(i) the reform effort that is being proposed for implementation by the institution of higher education;

"(ii) any available evidence of specific difficulties in the recruitment, retention, and advancement of faculty members from underrepresented minority groups in STEM academic careers within the institution of higher education submitting an application, and how the proposed reform effort would address such issues;

"(iii) how the institution of higher education submitting an application plans to sustain the proposed reform effort beyond the duration of the grant; and

"(iv) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to the national knowledge base about models for catalyzing institutional change.

"(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection, the Director of the Foundation shall consider, at a minimum—

"(i) the likelihood of success in undertaking the proposed reform effort at the institution of higher education submitting the application, including the extent to which the administrators of the institution are committed to making the proposed reform effort a priority;

"(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is placed on the recruitment, retention, and advancement of faculty members from underrepresented minority groups;

"(iii) the likelihood that the institution of higher education will sustain or expand the proposed reform effort beyond the period of the grant; and

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

"(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent practicable, that grants awarded under this sec-

tion are made to a variety of types of institutions of higher education.

"(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this subsection $8,000,000 for each of fiscal years 2020 through 2024.".

(b) NATIONAL SCIENCE FOUNDATION SUPPORT FOR BROADENING PARTICIPATION IN UNDERGRADUATE STEM EDUCATION.—Section 305 of the American Innovation and Competitiveness Act (42 U.S.C. 1862s–5), as amended by subsection (b), is further amended by inserting after subsection (e) the following:

"(f) SUPPORT FOR BROADENING PARTICIPATION IN UNDERGRADUATE STEM EDUCATION.—

"(1) IN GENERAL.—The Director of the Foundation shall award grants to institutions of higher education (or a consortium of such institutions) to implement or expand research-based reforms in undergraduate STEM education for the purpose of recruiting and retaining students from minority groups who are underrepresented in STEM fields.

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

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

"(A) implementation or expansion of innovative, research-based approaches to broaden participation of underrepresented minority groups in STEM fields;

"(B) implementation or expansion of bridge, cohort, tutoring, or mentoring programs, including those involving community colleges and technical schools, designed to enhance the recruitment and retention of students from underrepresented minority groups in STEM fields;

"(C) implementation or expansion of outreach programs linking institutions of higher education and K–12 school systems in order to heighten awareness among pre-college students from underrepresented minority groups of opportunities in college-level STEM fields and STEM careers;

"(D) implementation or expansion of faculty development programs focused on improving retention of undergraduate STEM students from underrepresented minority groups;

"(E) implementation or expansion of mechanisms designed to recognize and reward faculty members who demonstrate a commitment to increasing the participation of students from underrepresented minority groups in STEM fields;

"(F) expansion of successful reforms aimed at increasing the number of STEM students from underrepresented minority groups beyond a single course or group of courses to achieve reform within an entire academic unit, or expansion of successful reform efforts beyond a single academic unit or field to other STEM academic units or fields within an institution of higher education;

"(G) expansion of opportunities for students from underrepresented minority groups to conduct STEM research in industry, at Federal labs, and at international research institutions or research sites;

"(H) provision of stipends for students from underrepresented minority groups participating in research;

"(I) development of research collaborations between research-intensive universities and pri-

marily undergraduate minority-serving institutions;

"(J) support for graduate students and postdoctoral fellows from underrepresented minority groups to participate in instructional or assessment activities at primarily undergraduate institutions, including primarily undergraduate minority-serving institutions and two-year institutions of higher education; and

"(K) other activities consistent with paragraph (1), as determined by the Director of the Foundation.

"(4) SELECTION PROCESS.—

"(A) APPLICATION.—An institution of higher education (or a consortia thereof) seeking a grant under this subsection shall submit an application to the Director of the Foundation at such time, in such manner, and containing such information and assurances as such Director may require. The application shall include, at a minimum—

"(i) a description of the proposed reform effort;

"(ii) a description of the research findings that will serve as the basis for the

proposed reform effort or, in the case of applications that propose an expansion of a previously implemented reform, a description of the previously implemented reform effort, including data about the recruitment, retention, and academic achievement of students from underrepresented minority groups;

"(iii) evidence of an institutional commitment to, and support for, the proposed reform effort, including a long-term commitment to implement successful strategies from the current reform beyond the academic unit or units included in the grant proposal;

"(iv) a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching assignment that reward faculty contributions to improving the education of students from underrepresented minority groups in STEM; and

"(v) how the success and effectiveness of the proposed reform effort will be evaluated and assessed in order to contribute to

the national knowledge base about models for catalyzing institutional change.

"(B) REVIEW OF APPLICATIONS.—In selecting grant recipients under this subsection, the Director of the Foundation shall consider, at a minimum—

"(i) the likelihood of success of the proposed reform effort at the institution submitting the application, including the extent to which the faculty, staff, and administrators of the institution are committed to making the proposed institutional reform a priority of the participating academic unit or units;

"(ii) the degree to which the proposed reform effort will contribute to change in institutional culture and policy such that greater value is placed on faculty engagement in the retention of students from underrepresented minority groups;

"(iii) the likelihood that the institution will sustain or expand the proposed reform effort beyond the period of the grant; and

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

"(C) GRANT DISTRIBUTION.—The Director of the Foundation shall ensure, to the extent practicable, that grants awarded under this subsection are made to a variety of types of institutions of higher education, including two-year and minority-serving institutions of higher education.

"(5) EDUCATION RESEARCH.—

"(A) IN GENERAL.—All grants made under this subsection shall include an education research component that will support the design and implementation of a system for data collection and evaluation of proposed reform efforts in order to build the knowledge base on promising models for increasing recruitment and retention of students from underrepresented minority groups in STEM education at the undergraduate level across a diverse set of institutions.

"(B) DISSEMINATION.—The Director of the Foundation shall coordinate with relevant Federal agencies in disseminating the results of

the research under this paragraph to ensure that best practices in broadening participation in STEM education at the undergraduate level are made readily available to all institutions of higher education, other Federal agencies that support STEM programs, non-Federal funders of STEM education, and the general public.

"(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this subsection $15,000,000 for each of fiscal years 2020 through 2024.".

SEC. 10. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.

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

"(d) GRANTS TO BROADEN TRIBAL COLLEGE AND UNIVERSITY STUDENT PARTICIPATION IN COMPUTER SCIENCE.—

"(1) IN GENERAL.—The Director, as part of the program authorized under this section, shall award grants on a competitive, merit-reviewed basis to eligible entities to increase the participation of tribal populations in computer science and computa-

tional thinking education programs to enable students to develop skills and competencies in coding, problem-solving, critical thinking, creativity and collaboration.

"(2) PURPOSE.—Grants awarded under this subsection shall support—

"(A) research and development needed to bring computer science and computational thinking courses and degrees to tribal colleges and universities;

"(B) research and development of instructional materials needed to integrate computer science and computational thinking into programs that are culturally relevant to students attending tribal colleges and universities;

"(C) research, development and evaluation of distance education for computer science and computational thinking courses and degree programs for students attending tribal colleges and universities; and

"(D) other activities consistent with the activities described in paragraphs (1) through (4) of subsection (b), as determined by the Director.

"(3) PARTNERSHIPS.—A tribal college or university seeking a grant under this subsection, or a consortia thereof, may partner with an institution of higher education or nonprofit organization with demonstrated expertise in academic program development.

"(4) COORDINATION.—In carrying out this subsection, the Director shall consult and cooperate with the programs and policies of other relevant Federal agencies to avoid duplication with and enhance the effectiveness of the program under this subsection.

"(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the Foundation $2,000,000 in each of fiscal years 2020 through 2024 to carry out this subsection.".

(b) EVALUATION.—

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

(2) REQUIREMENTS.—In conducting the evaluation under paragraph (1), the Director of the National Science Foundation shall, as practicable—

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

(B) include an assessment of the effectiveness of such grant programs in expanding access to high quality STEM education, research, and outreach at tribal colleges and universities, as applicable;

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

(D) assess the percentage of students participating in such grant programs who successfully complete their education programs.

(3) REPORT.—Not later than 180 days after the date on which the evaluation under paragraph (1) is completed, the Director of the National Science Foundation shall submit to Congress and make available to the public, a report on the results

of the evaluation, including any recommendations for legislative action that could optimize the effectiveness of the grant program authorized under section 525 of the America COMPETES Reauthorization Act of 2010, as amended by subsection (a).

SEC. 11. REPORT TO CONGRESS.

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

(1) a description and evaluation of the status and usage of policies implemented pursuant to section 3 at all Federal science agencies, including any recommendations for revising or expanding such policies;

(2) with respect to efforts to minimize the effects of implicit bias in the review of extramural and intramural Federal research grants under section 5—

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

(B) a description of any significant updates to the policies for review of Federal research grants required under such section; and

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

(3) a description and evaluation of the status of institution of higher education and Federal laboratory policies and practices required under section 7(a), including any recommendations for revising or expanding such policies.

SEC. 12. MERIT REVIEW.

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

SEC. 13. DEFINITIONS.

In this Act:

(1) DIRECTOR.—The term "Director" means the Director of the Office of Science and Technology Policy.

(2) FEDERAL LABORATORY.—The term "Federal laboratory" has the meaning given such term in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703).

(3) FEDERAL SCIENCE AGENCY.—The term "Federal science agency" means any Federal agency with at least $100,000,000 in research and development expenditures in fiscal year 2018.

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

(5) INTERAGENCY WORKING GROUP ON INCLUSION IN STEM.—The term "interagency working group on inclusion in STEM" means the interagency working group established by section 308 of the American Innovation and Competitiveness Act (42 U.S.C. 6626).

(6) STEM.—The term "STEM" means science, technology, engineering, and mathematics, including computer science.

Amend the title so as to read: "A bill to direct the Director of the Office of Science and Technology Policy and Federal science agencies 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 the entire talent pool of the United States, and for other purposes.".

☒

Chairwoman JOHNSON. I ask unanimous consent to dispense of the reading, and without objection, so ordered.

I recognize myself to explain the amendment. Excuse me.

The amendment includes clarifying and technical changes, including changes to reflect feedback from Federal and non-Federal stakeholders. I urge support of this amendment.

Are there any other——

Mr. LUCAS. Madam Chair?

Chairwoman JOHNSON. Mr. Lucas.

Mr. LUCAS. Thank you, Chairwoman Johnson.

This amendment strikes and replaces the text of H.R. 2528 to incorporate stakeholder and agency feedback in the bill. This amendment was drafted in a bipartisan way and includes a number of improvements to the original draft. Among the changes, the amendment incorporates feedback from the White House Office of Science and Technology Policy, which is consistent with the Administration's 5-year strategic plan and specifically calls for an increase of diversity, equity, and inclusion of STEM programs.

I encourage my colleagues to support this amendment. I yield back, Madam Chair.

Chairwoman JOHNSON. Thank you very much.

Are there any other comments or any other amendments?

Then we will proceed with the next amendment and vote on my amendment after it has been amended.

Mr. Lipinski.

Mr. LIPINSKI. Madam Chair, I have an amendment at the desk.

Chairwoman JOHNSON. The clerk will report the amendment.

The CLERK. Amendment number 2 offered by——

[The amendment of Mr. Lipinski follows:]

AMENDMENT TO THE AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. 2528 OFFERED BY MR. LIPINSKI OF ILLINOIS

Page 22, beginning on line 5, strike "undergraduate and graduate" and insert "undergraduate, graduate, and postdoctoral".

Page 27, line 9, insert "and postdoctoral researchers" after "graduate students".

☒

Chairwoman JOHNSON. I ask unanimous consent to dispense with the reading, and without objection, so ordered.

I recognize the gentleman for 5 minutes to explain his amendment.

Mr. LIPINSKI. Thank you, Madam Chair.

I applaud your leadership to make opportunities in STEM more accessible to those from underrepresented groups. I think the work in this bill would make great strides toward improving diversity in the STEM workforce, especially in academia. I want STEM careers to be accessible to all, and my amendment would explicitly include in this bill postdoctoral researchers as trainees who would benefit from mentoring and encouragement to pursue academic careers.

Postdoctoral researchers are important to our universities in a greater research enterprise. These scholars hold doctoral degrees and engage in mentored research or scholarly training as a means of professional development often to learn a new skill or gain more experience before moving on to more permanent positions. In addition to broadening or deepening their own skill set, postdoctoral researchers often serve as mentors and day-to-day supervisors to graduate and undergraduate students. This unique place in the research environment makes postdoc researchers both mentees and mentors. The quality of mentoring that postdocs receive heavily influences their career choices, and it's important that faculty and senior researchers are prepared to mentor postdoctoral researchers.

We can probably all agree that the mentoring of graduate students is fundamentally different from mentoring undergraduate students, as these populations have different needs. Similarly, the mentoring of postdoctoral researchers requires attention to different details, and these researchers are simultaneously colleagues and trainees.

By explicitly mentioning postdoctoral researchers, as proposed in my amendment, we will ensure that the mentoring workshop programs, as funded by the National Science Foundation, may include best practices in the mentoring of postdoctoral researchers.

I'm also glad to see this bill would encourage undergraduate and graduate students from underrepresented groups to consider academic careers. I believe that we should also encourage our postdoctoral researchers from underrepresented groups to pursue academic careers. My amendment also makes a provision explicit in the bill such that funds from the National Science Foundation may be used for this purpose.

Madam Chair, I ask for my colleagues' support for this amendment, and I yield back.

Chairwoman JOHNSON. Thank you.

Any further discussion on this amendment?

If not, the vote occurs on the amendment.

All in favor, say aye.

Those opposed, nay.

The ayes have it, and the amendment is agreed to.

Now, we will have the vote on the amendment in the nature of a substitute.

Are there any other amendments?

If not, the vote occurs on the Chair's amendment in the nature of a substitute.

All in favor, say aye.

Those opposed, no.

The ayes have it, and the amendment is agreed to.

A reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 2528, as amended, to the House and with the recommendation that the bill be approved.

Those in favor of the motion may signify by saying aye.

Those opposed, nay.

The ayes have it, and the bill is favorably considered.

Without objection, the motion to reconsider is laid upon the table, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes to the bill. Without objection, so ordered.

Members will have 2 subsequent calendar days in which to submit supplementary, minority, or additional views on this measure.

H.R. 36

10:25 a.m.

Chairwoman JOHNSON. We now will move to H.R. 36, *Combating Sexual Harassment in Science Act of 2019*. The clerk will report the bill.

The CLERK. H.R. 36, a bill to provide for research to better understand the causes and consequences of sexual harassment——

[The bill follows:]

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