(Original Signature of Member)

117TH CONGRESS
2D SESSION

H. R. _____

To authorize the National Science Foundation to make awards to institutions of higher education and non-profit organizations for research, development, and related activities to advance innovative approaches to developing, improving, and expanding evidence-based microelectronics education and workforce development activities and learning experiences at all levels of education, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Ms. STEVENS introduced the following bill; which was referred to the Committee on _____

A BILL

To authorize the National Science Foundation to make awards to institutions of higher education and non-profit organizations for research, development, and related activities to advance innovative approaches to developing, improving, and expanding evidence-based microelectronics education and workforce development activities and learning experiences at all levels of education, 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.

This Act may be cited as the ''Creating Helpful Initiatives to Produce Personnel in Needed Growth Industries'' or the ''CHIPPING IN Act of 2022''.

SEC. 2. FINDINGS.

Congress finds the following:

(1) While microelectronics are a primary driver of economic growth and scientific advancement, the United States has lost much of its capacity to design and manufacture, test, and package microelectronics and microelectronics systems domestically.

(2) Current educational and vocational training opportunities are insufficient to meet the domestic microelectronics industry workforce needs. The deficit between open jobs and qualified workers is projected to grow as design and manufacturing activities increase.

(3) Growth in microelectronics design and manufacturing capabilities may be limited by a lack of qualified workers.

(4) The United States education pathways for microelectronics faces significant challenges, from a lack of gender and racial diversity to an inability of universities and community colleges to attract and retain faculty and other instructors qualified to teach microelectronics.

(5) Students often fail to get the hands-on training they need to succeed in microelectronics careers, especially at the community or technical college level.

(6) Skilled technical jobs in the manufacturing industry and in the microelectronics design industry are well-suited for apprenticeship and other paid training models, however prospective participants must have adequate STEM training.

(7) The microelectronics industry suffers from a lack of awareness and visibility as pre-college students, students pursuing STEM degrees, technical workers, and doctorate-level researchers seek employment in other industries.

(8) Lack of access to co-located design and fabrication facilities, including attendant software licensing issues is a deterrent for United States competitiveness and workforce development.

(9) In order to help drive forward advances in microelectronics and increase domestic microelectronics design and manufacturing capability, the Federal Government must provide sufficient resources and use its convening power to facilitate the growth of microelectronics talent in academia, the

Federal Government, and the microelectronics industry.

SEC. 3. NATIONAL SCIENCE FOUNDATION MICROELECTRONICS EDUCATION ACTIVITIES.

(a) DEFINITIONS.—In this section:

(1) DIRECTOR.—The term ''Director'' means the Director of the National Science Foundation.

(2) FOUNDATION.—The term ''Foundation'' means the National Science Foundation.

(3) HISTORICALLY BLACK COLLEGE OR UNIVERSITY.—The term ''historically Black college or university'' has the meaning given the term ''part B institution'' in section 322 of the Higher Education Act of 1965 (20 U.S.C. 1061).

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

(5) K–12 EDUCATION.—The term ''K–12 education'' means elementary school and secondary education, as such terms are defined in section 8101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801).

(6) LABOR ORGANIZATION.—The term ''labor organization'' has the meaning given the term in

paragraph (5) of section 2 of the National Labor Relations Act (29 U.S.C. 152), except that such term shall also include—

(A) any organization composed of labor organizations, such as a labor union federation or a State or municipal labor body; and

(B) any organization which would be included in the definition of such term under such paragraph (5) but for the fact the organization represents—

(i) individuals employed by the United States, any wholly owned Government corporation, any Federal Reserve Bank, or any State or political subdivision thereof;

(ii) individuals employed by persons subject to the Railway Labor Act (45 U.S.C. 151 et seq.); or

(iii) individuals employed as agricultural laborers.

(7) MINORITY-SERVING INSTITUTION.—The term ''minority-serving institution'' means—

(A) a Hispanic-serving institution (as such term is defined in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a));

(B) an Alaska Native-serving institution and Native Hawaiian-serving institution (as such terms are defined in section 317 of the Higher Education Act of 1965 (20 U.S.C. 1059d)); and

(C) Predominantly Black institutions, Asian American and Native American Pacific Islander-serving Institutions, and Native American-serving Nontribal Institutions (as such terms are defined in section 371 of the Higher Education Act of 1965 (20 U.S.C. 1067q(c))).

(8) TRIBAL COLLEGE OR UNIVERSITY.—The term ''Tribal College or University'' has the meaning given the term ''Tribal College or University'' in section 316 of the Higher Education Act of 1965 (20 U.S.C. 1059c).

(9) STEM.—The term ''STEM'' means the academic and professional disciplines of science, technology, engineering, and mathematics, including computer science.

(10) MICROELECTRONICS.—The term ''microelectronics'' means semiconductors and related materials, processing chemistries, design, fabrication, manufacturing, lithography, packaging, sensors, devices, integrated circuits, processors, computing ar-

chitectures, modeling and simulation, software tools, and related technologies.

(b) NATIONAL SCIENCE FOUNDATION MICROELECTRONICS EDUCATION ACTIVITIES.—

(1) IN GENERAL.—The Director shall make awards to institutions of higher education, non-profit organizations, or consortia thereof, for research, development, and related activities to advance innovative approaches to developing, improving, and expanding evidence-based education and workforce development activities and learning experiences at all levels of education in fields and disciplines related to microelectronics.

(2) PURPOSES.—Activities carried out under this section shall be for the purpose of supporting the growth, retention, and development of a diverse, flexible, and sustainable microelectronics workforce that meets the evolving needs of industry, academia, and Federal laboratories.

(3) USES OF FUNDS.—Awards made under this subsection shall be used for the following:

(A) To develop curricula and teaching modules for topics relevant to microelectronics, including those modules that provide meaning-

ful hands-on learning experiences, including at the K–12 education level.

(B) To disseminate materials developed pursuant to subparagraph (A), including through the creation and maintenance of a publicly-accessible database.

(C) To implement training, research, and professional development programs for teachers, including innovative pre-service and in-service programs, in microelectronics and related fields.

(D) To support learning activities that provide physical, simulated, or remote access to training facilities and industry-standard processes and tools, including equipment and software for the design, development, and manufacture of microelectronics.

(E) To increase the integration of microelectronics content into STEM curricula at all education levels.

(F) To provide informal hands-on learning opportunities for K–12 students in microelectronics, including competitions.

(G) To carry out such other activities as the Director determines appropriate.

(4) ADVANCED MICROELECTRONICS TRAINEESHIPS.—

(A) IN GENERAL.—The Director shall make awards to institutions of higher education and non-profit organizations (or consortia of such institutions and organizations) to establish traineeship programs for graduate students who pursue microelectronics research leading to a masters or doctorate degree by providing funding and other assistance, and by providing graduate students with opportunities for research experiences in government or industry related to such students' microelectronics studies.

(B) USE OF FUNDS.—An institution of higher education or non-profit organizations (or consortia of such institutions and organizations) shall use award funds provided under subparagraph (A) for the following purposes:

(i) Paying tuition and fees, and providing stipends, for students receiving traineeships who are citizens, nationals, or aliens lawfully admitted for permanent residence.

(ii) Facilitating opportunities for scientific internship programs for students receiving traineeships in microelectronics at private industry, nonprofit research institutions, or Federal laboratories.

(iii) Such other costs associated with the administration of the program.

(5) MICROELECTRONICS RESEARCH EXPERIENCES THROUGH EXISTING PROGRAMS.—The Director shall seek to increase opportunities for microelectronics research for students and trainees at all levels by encouraging proposals in microelectronics through existing programs, including the following:

(A) Research experiences for undergraduates pursuant to section 514 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. 1862p–6).

(B) Postdoctoral fellowship programs established pursuant to section 522 of the America COMPETES Act of 2010 (42 U.S.C. 1862p–11).

(C) Graduate fellowships established pursuant to section 10 of the National Science Foundation Act of 1950 (42 U.S.C. 1869).

(D) Informal STEM education programs established pursuant to section 3 of the STEM Education Act of 2015 (42 U.S.C. 1862q).

(E) The Robert Noyce Teacher Scholarship Program established pursuant to section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1).

(F) Major research instrumentation programs established pursuant to section 7036 of the America COMPETES Act (42 U.S.C. 1862o–14).

(G) Scientific and technical education programs established pursuant to section 3 of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862i).

(6) INDUSTRY PARTNERSHIPS.—In carrying out the activities under this subsection, the Director shall encourage awardees to partner with industry and other private sector organizations to facilitate the expansion of workforce pipelines and enable access to industry-standard equipment and software for use in undergraduate and graduate microelectronics education programs.

(7) INTERAGENCY COORDINATION.—The Director shall collaborate with the Subcommittee on

Microelectronics Leadership of the National Science and Technology Council, established pursuant to section 9906(a) of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Public Law 116–283; 15 U.S.C. 4656), to maintain the effectiveness of microelectronics workforce development activities across the agencies.

(c) NATIONAL NETWORK FOR MICROELECTRONICS EDUCATION.—

(1) IN GENERAL.—The Director shall, on a competitive, merit-reviewed basis, make awards to institutions of higher education and non-profit organizations (or consortia of such institutions and organizations) to establish partnerships to enhance and broaden participation in microelectronics education.

(2) ACTIVITIES.—Awards made under this subsection shall be used for the following:

(A) To conduct training and education activities, including curricula design, development, dissemination, and assessment, and share information and best practices across the network of awardees.

(B) To develop regional partnerships among associate-degree-granting colleges, bachelor-degree-granting institutions, workforce de-

velopment programs, labor organizations, and industry to create a diverse national technical workforce trained in microelectronics and ensure education and training is meeting the evolving needs of industry.

(C) To facilitate partnerships with employers, employer consortia or other private sector organizations that offer apprenticeships, internships, or applied learning experiences in the field of microelectronics.

(D) To develop shared infrastructure available to institutions of higher education, two-year colleges, and private organizations to enable experiential learning activities and provide physical or digital access to training facilities and industry-standard tools and processes.

(E) To create and disseminate public outreach to support awareness of microelectronics education and career opportunities, including through outreach to K–12 schools and STEM-related organizations.

(F) To collaborate and coordinate with industry and existing public and private organizations conducting microelectronics education and workforce development activities, as practicable.

(3) NATIONAL NETWORK FOR MICROELECTRONICS EDUCATION.—The Director shall make an award to an organization to establish a national network of partnerships (referred to in this section as the ''National Network for Microelectronics Education'') to coordinate activities, best practice sharing, and access to facilities across the partnerships established in accordance with paragraph (1).

(4) INCENTIVIZING PARTICIPATION.—To the extent practicable, the Director shall encourage participation in the National Network for Microelectronics Education under paragraph (3) through the coordination of activities and distribution of awards described in subsection (b).

(5) PARTNERSHIPS.—The Director shall encourage the submission of proposals that are led by historically Black colleges and universities, Tribal Colleges or Universities, and minority-serving institutions or that include partnerships with or among such institutions to increase the recruitment of students from groups historically underrepresented in STEM to pursue graduate studies in microelectronics.

(6) OUTREACH.—In addition to any other requirements as determined appropriate by the Direc-

tor, the Director shall require that proposals for awards under this subsection shall include a description of how the applicant will develop and implement outreach activities to increase the participation of women and other students from groups historically underrepresented in STEM.

(7) COORDINATION ACROSS FOUNDATION PROGRAMS.—In carrying out the activities under this subsection, the Director shall ensure awardees coordinate with, and avoid unnecessary duplication of, activities carried out pursuant to the 21st Century Nanotechnology Research and Development Act (Public Law 108–153), the National Quantum Initiative Act (Public Law 115–368), the National Artificial Intelligence Initiative Act of 2020 (enacted as division E of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Public Law 116–283)), and other related programs, as appropriate.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated $250,000,000 to the Foundation for fiscal years 2023 through 2027 to carry out this section.