

of the mission of the National Oceanic and Atmospheric Administration;

(4) develop and conduct training for the workforce of the National Oceanic and Atmospheric Administration related to artificial intelligence research and application of artificial intelligence for such agency;

(5) facilitate partnerships between the National Oceanic and Atmospheric Administration and other public sector organizations, private sector organizations, and institutions of higher education for research, personnel exchange, and workforce development with respect to artificial intelligence systems; and

(6) make data of the National Oceanic and Atmospheric Administration accessible, available, and ready for artificial intelligence applications.

**(e) Stakeholder engagement**

In carrying out the activities authorized in this section, the Administrator shall—

(1) collaborate with a diverse set of stakeholders including private sector entities and institutions of higher education;

(2) leverage the collective body of research on artificial intelligence and machine learning; and

(3) engage with relevant Federal agencies, research communities, and potential users of data and methods made available through the Center.

**(f) Authorization of appropriations**

There are authorized to be appropriated to the Administrator to carry out this section \$10,000,000 for fiscal year 2021.

**(g) Protection of national security interests**

**(1) In general**

Notwithstanding any other provision of this section, the Administrator, in consultation with the Secretary of Defense as appropriate, may withhold models or data used by the Center if the Administrator determines doing so to be necessary to protect the national security interests of the United States.

**(2) Rule of construction**

Nothing in this section shall be construed to supersede any other provision of law governing the protection of the national security interests of the United States.

(Pub. L. 116-283, div. E, title LIII, § 5303, Jan. 1, 2021, 134 Stat. 4539.)

SUBCHAPTER IV—NATIONAL SCIENCE FOUNDATION ARTIFICIAL INTELLIGENCE ACTIVITIES

**§ 9451. Artificial intelligence research and education**

**(a) In general**

the<sup>1</sup> Director of the National Science Foundation shall fund research and education activities in artificial intelligence systems and related fields, including competitive awards or grants to

institutions of higher education or eligible non-profit organizations (or consortia thereof).

**(b) Uses of funds**

In carrying out the activities under subsection (a), the Director of the National Science Foundation shall—

(1) support research, including interdisciplinary research, on artificial intelligence systems and related areas, including fields and research areas that will contribute to the development and deployment of trustworthy artificial intelligence systems, and fields and research areas that address the application of artificial intelligence systems to scientific discovery and societal challenges;

(2) use the existing programs of the National Science Foundation, in collaboration with other Federal departments and agencies, as appropriate to—

(A) improve the teaching and learning of topics related to artificial intelligence systems in K-12 education and postsecondary educational programs, including workforce training and career and technical education programs, undergraduate and graduate education programs, and in informal settings; and

(B) increase participation in artificial intelligence related fields, including by individuals identified in sections 1885a and 1885b of title 42;

(3) support partnerships among institutions of higher education, Federal laboratories, non-profit organizations, State, local, and Tribal governments, industry, and potential users of artificial intelligence systems that facilitate collaborative research, personnel exchanges, and workforce development and identify emerging research needs with respect to artificial intelligence systems;

(4) ensure adequate access to research and education infrastructure with respect to artificial intelligence systems, which may include the development of new computing resources and partnership with the private sector for the provision of cloud-based computing services;

(5) conduct prize competitions, as appropriate, pursuant to section 3719 of this title;

(6) coordinate research efforts funded through existing programs across the directorates of the National Science Foundation;

(7) provide guidance on data sharing by grantees to public and private sector organizations consistent with the standards and guidelines developed under section 278h-1(e) of this title (as added by section 5301 of this division); and

(8) evaluate opportunities for international collaboration with strategic allies on artificial intelligence research and development.

**(c) Engineering support**

In general, the Director shall permit applicants to include in their proposed budgets funding for software engineering support to assist with the proposed research.

**(d) Ethics**

**(1) Sense of Congress**

It is the sense of Congress that—

<sup>1</sup> So in original.

(A) a number of emerging areas of research, including artificial intelligence, have potential ethical, social, safety, and security risks that might be apparent as early as the basic research stage;

(B) the incorporation of ethical, social, safety, and security considerations into the research design and review process for Federal awards may help mitigate potential harms before they happen;

(C) the National Science Foundation's agreement with the National Academies of Sciences, Engineering, and Medicine to conduct a study and make recommendations with respect to governance of research in computing and computing technologies is a positive step toward accomplishing this goal; and

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

**(2) Report on ethics statements**

No later than 6 months after publication of the study described in paragraph (1)(C), the Director shall report to Congress on options for requiring an ethics or risk statement as part of all or a subset of applications for research funding to the National Science Foundation.

**(e) Education**

**(1) In general**

The Director of the National Science Foundation shall award grants for artificial intelligence education research, development and related activities to support K-12 and postsecondary education programs and activities, including workforce training and career and technical education programs and activities, undergraduate, graduate, and postdoctoral education, and informal education programs and activities that—

(A) support the development of a diverse workforce pipeline for science and technology with respect to artificial intelligence systems;

(B) increase awareness of potential ethical, social, safety, and security risks of artificial intelligence systems;

(C) promote curriculum development for teaching topics related to artificial intelligence, including in the field of technology ethics;

(D) support efforts to achieve equitable access to K-12 artificial intelligence education in diverse geographic areas and for populations historically underrepresented in science, engineering, and artificial intelligence fields; and

(E) promote the widespread understanding of artificial intelligence principles and methods to create an educated workforce and general public able to use products enabled by artificial intelligence systems and adapt to future societal and economic changes caused by artificial intelligence systems.

**(2) Artificial intelligence faculty fellowships**

**(A) Faculty recruitment fellowships**

**(i) In general**

The Director of the National Science Foundation shall establish a program to award grants to eligible institutions of higher education to recruit and retain tenure-track or tenured faculty in artificial intelligence and related fields.

**(ii) Use of funds**

An institution of higher education shall use grant funds provided under clause (i) for the purposes of—

(I) recruiting new tenure-track or tenured faculty members that conduct research and teaching in artificial intelligence and related fields and research areas, including technology ethics; and

(II) paying salary and benefits for the academic year of newly recruited tenure-track or tenured faculty members for a duration of up to three years.

**(iii) Eligible institutions of higher education**

For purposes of this subparagraph, an eligible institution of higher education is—

(I) a Historically Black College and University (within the meaning of the term “part B institution” under section 1061 of title 20), Tribal College or University, or other minority-serving institution, as defined in section 1067q(a) of title 20;

(II) an institution classified under the Carnegie Classification of Institutions of Higher Education as a doctorate-granting university with a high level of research activity; or

(III) an institution located in a State jurisdiction eligible to participate in the National Science Foundation's Established Program to Stimulate Competitive Research.

**(B) Faculty technology ethics fellowships**

**(i) In general**

The Director of the National Science Foundation shall establish a program to award fellowships to tenure-track and tenured faculty in social and behavioral sciences, ethics, law, and related fields to develop new research projects and partnerships in technology ethics.

**(ii) Purposes**

The purposes of such fellowships are to enable researchers in social and behavioral sciences, ethics, law, and related fields to establish new research and education partnerships with researchers in artificial intelligence and related fields; learn new techniques and acquire systematic knowledge in artificial intelligence and related fields; and mentor and advise graduate students and postdocs pursuing research in technology ethics.

**(iii) Uses of funds**

A fellowship may include salary and benefits for up to one academic year, expenses

to support coursework or equivalent training in artificial intelligence systems, and additional such expenses that the Director deems appropriate.

**(C) Omitted**

**(3) Update to advanced technological education program**

**(A) Omitted**

**(B) Artificial intelligence centers of excellence**

The Director of the National Science Foundation shall establish national centers of scientific and technical education to advance education and workforce development in areas related to artificial intelligence pursuant to section 1862i of title 42. Activities of such centers may include—

(i) the development, dissemination, and evaluation of curriculum and other educational tools and methods in artificial intelligence related fields and research areas, including technology ethics;

(ii) the development and evaluation of artificial intelligence related certifications for 2-year programs; and

(iii) interdisciplinary science and engineering research in employment-based adult learning and career retraining related to artificial intelligence fields.

**(f) National Science Foundation pilot program of grants for research in rapidly evolving, high priority topics**

**(1) Pilot program required**

The Director of the National Science Foundation shall establish a pilot program to assess the feasibility and advisability of awarding grants for the conduct of research in rapidly evolving, high priority topics using funding mechanisms that require brief project descriptions and internal merit review, and that may include accelerated external review.

**(2) Duration**

**(A) In general**

The Director shall carry out the pilot program required by paragraph (1) during the 5-year period beginning on January 1, 2021.

**(B) Assessment and continuation authority**

After the period set forth in paragraph (2)(A)—

(i) the Director shall assess the pilot program; and

(ii) if the Director determines that it is both feasible and advisable to do so, the Director may continue the pilot program.

**(3) Grants**

In carrying out the pilot program, the Director shall award grants for the conduct of research in topics selected by the Director in accordance with paragraph (4).

**(4) Topic selection**

The Director shall select topics for research under the pilot program in accordance with the following:

(A) The Director shall select artificial intelligence as the initial topic for the pilot program.

(B) The Director may select additional topics that the Director determines are—

(i) rapidly evolving; and

(ii) of high importance to the economy and security of the United States.

**(g) Authorization of appropriations**

There are authorized to be appropriated to the National Science Foundation to carry out this section—

(1) \$868,000,000 for fiscal year 2021;

(2) \$911,400,000 for fiscal year 2022;

(3) \$956,970,000 for fiscal year 2023;

(4) \$1,004,820,000 for fiscal year 2024; and

(5) \$1,055,060,000 for fiscal year 2025.

(Pub. L. 116-283, div. E, title LIV, §5401, Jan. 1, 2021, 134 Stat. 4540.)

**Editorial Notes**

REFERENCES IN TEXT

Sections 1885a and 1885b of title 42, referred to in subsec. (b)(2)(B), were in the original sections 33 and 34 of the Science and Engineering Equal Opportunity Act and were translated as meaning sections 33 and 34 of the Science and Engineering Equal Opportunities Act to reflect the probable intent of Congress.

Section 5301 of this division, referred to in subsec. (b)(7), means section 5301 of div. E of Pub. L. 116-283, Jan. 1, 2021, 134 Stat. 4536.

CODIFICATION

Section is comprised of section 5401 of Pub. L. 116-283. Subsec. (e)(2)(C) of section 5401 of Pub. L. 116-283 amended section 1862n-1 of Title 42, The Public Health and Welfare. Subsec. (e)(3)(A) of section 5401 of Pub. L. 116-283 amended section 1862i of Title 42.

SUBCHAPTER V—DEPARTMENT OF ENERGY ARTIFICIAL INTELLIGENCE RESEARCH PROGRAM

**§9461. Department of Energy artificial intelligence research program**

**(a) In general**

The Secretary shall carry out a cross-cutting research and development program to advance artificial intelligence tools, systems, capabilities, and workforce needs and to improve the reliability of artificial intelligence methods and solutions relevant to the mission of the Department. In carrying out this program, the Secretary shall coordinate across all relevant offices and programs at the Department, including the Office of Science, the Office of Energy Efficiency and Renewable Energy, the Office of Nuclear Energy, the Office of Fossil Energy, the Office of Electricity, the Office of Cybersecurity, Energy Security, and Emergency Response, the Advanced Research Projects Agency-Energy, and any other relevant office determined by the Secretary.

**(b) Research areas**

In carrying out the program under subsection (a), the Secretary shall award financial assistance to eligible entities to carry out research projects on topics including—

(1) the application of artificial intelligence systems to improve large-scale simulations of natural and other phenomena;

(2) the study of applied mathematics, computer science, and statistics, including founda-