

118TH CONGRESS  
2D SESSION

# S. 4236

To authorize the Director of the National Science Foundation to identify grand challenges and award competitive prizes for artificial intelligence research and development.

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IN THE SENATE OF THE UNITED STATES

MAY 1, 2024

Mr. BOOKER (for himself, Mr. ROUNDS, and Mr. HEINRICH) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

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## A BILL

To authorize the Director of the National Science Foundation to identify grand challenges and award competitive prizes for artificial intelligence research and development.

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

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “AI Grand Challenges  
5 Act of 2024”.

1 **SEC. 2. PRIZE COMPETITIONS FOR ARTIFICIAL INTEL-**  
2 **LIGENCE RESEARCH AND DEVELOPMENT.**

3 (a) DEFINITION.—Except as otherwise expressly pro-  
4 vided, in this section the term “Director” means the Di-  
5 rector of the National Science Foundation.

6 (b) ESTABLISHMENT OF PROGRAM.—

7 (1) IN GENERAL.—Not later than 12 months  
8 after the date of enactment of this Act, the Director,  
9 in coordination with the Interagency Committee es-  
10 tablished under section 5103 of the National Artifi-  
11 cial Intelligence Initiative Act of 2020 (15 U.S.C.  
12 9413), shall establish a program to award prizes,  
13 utilizing the authorities and processes established  
14 under section 24 of the Stevenson-Wydler Tech-  
15 nology Innovation Act of 1980 (15 U.S.C. 3719), to  
16 eligible participants as determined by the Director  
17 pursuant to subsection (e) to stimulate artificial in-  
18 telligence research, development, and commercializa-  
19 tion that solves or advances specific, well-defined,  
20 and measurable grand challenges in 1 or more of the  
21 following categories:

22 (A) National security.

23 (B) Cybersecurity.

24 (C) Health.

25 (D) Energy.

26 (E) Environment.

1 (F) Transportation.

2 (G) Agriculture and rural development.

3 (H) Education and workforce training.

4 (I) Manufacturing.

5 (J) Space and aerospace.

6 (K) Quantum computing, including molec-  
7 ular modeling and simulation.

8 (L) Materials science.

9 (M) Supply chain resilience.

10 (N) Disaster preparedness.

11 (O) Natural resources management.

12 (P) Cross cutting challenges in artificial  
13 intelligence, including robustness,  
14 interpretability, explainability, transparency,  
15 safety, privacy, content provenance, and bias  
16 mitigation.

17 (2) DESIGNATION.—The grand challenges and  
18 prize competition program established under para-  
19 graph (1) shall be known as the “AI Grand Chal-  
20 lenges Program”.

21 (3) ROTATORS.—Participants in the Rotator  
22 Program of the National Science Foundation may  
23 support the development and implementation of the  
24 AI Grand Challenges Program.

1 (c) GRAND CHALLENGES SELECTION AND GRAND  
2 CHALLENGES INFORMATION.—

3 (1) IN GENERAL.—

4 (A) CONSULTATION ON IDENTIFICATION  
5 AND SELECTION.—The Director shall consult  
6 with the Director of the Office of Science and  
7 Technology Policy, the Director of the National  
8 Institute of Standards and Technology, the Di-  
9 rector of the Defense Advanced Research  
10 Projects Agency, the heads of relevant Federal  
11 agencies, and the National Artificial Intelligence  
12 Advisory Committee to identify and select arti-  
13 ficial intelligence research and development  
14 grand challenges in which eligible participants  
15 will compete to solve or advance for prize  
16 awards under subsection (b).

17 (B) PUBLIC INPUT ON IDENTIFICATION.—  
18 The Director shall also seek public input on the  
19 identification of artificial intelligence research  
20 and development grand challenges.

21 (2) PROBLEM STATEMENTS; SUCCESS  
22 METRICS.—For each grand challenge selected under  
23 paragraph (1) and the grand challenge under para-  
24 graph (3), the Director shall—

1 (A) establish a specific and well-defined  
2 grand challenge problem statement and ensure  
3 that such problem statement is published on the  
4 National Science Foundation website linking  
5 out to relevant prize competition listings on the  
6 website Challenge.gov that is managed by the  
7 General Services Administration; and

8 (B) establish and publish on the website  
9 Challenge.gov clear targets, success metrics,  
10 and validation protocols for the prize competi-  
11 tions designed to address each grand challenge,  
12 in order to provide specific benchmarks that  
13 will be used to evaluate submissions to the prize  
14 competition.

15 (3) GRAND CHALLENGE FOR ARTIFICIAL INTEL-  
16 LIGENCE-ENABLED CANCER BREAKTHROUGHS.—

17 (A) REQUIRED PRIZE COMPETITION.—Not  
18 later than 1 year after the date of enactment of  
19 this Act, the Director, in consultation with the  
20 Director of the Office of Science and Tech-  
21 nology Policy and the Director of the National  
22 Institutes of Health, shall establish not less  
23 than 1 grand challenge in which eligible partici-  
24 pants will compete in a prize competition to  
25 solve or advance solutions for prize awards

1 under subsection (b) that seek to advance med-  
2 ical breakthroughs to address 1 or more of the  
3 most lethal forms of cancer and related  
4 comorbidities. The grand challenge shall relate  
5 to detection, diagnostics, treatments, thera-  
6 peutics, or other innovations in artificial intel-  
7 ligence to increase the total quality-adjusted life  
8 years of those affected or likely to be affected  
9 by cancer.

10 (B) PRIZE AMOUNT.—In carrying out the  
11 prize competition under subparagraph (A), the  
12 Director shall award not less than \$10,000,000  
13 in cash prize awards to each winner.

14 (4) AMBITIOUS AND ACHIEVABLE GOALS.—  
15 Grand challenges selected under paragraph (1) and  
16 the grand challenge under paragraph (3) shall be  
17 ambitious but achievable goals that utilize science,  
18 technology, and innovation to solve or advance solu-  
19 tions to problems to benefit the United States.

20 (d) ADDITIONAL CONSULTATION.—The Director may  
21 consult with, and incorporate effective practices from,  
22 other entities that have developed successful large-scale  
23 technology demonstration prize competitions, including  
24 the Defense Advanced Research Projects Agency, the Na-  
25 tional Aeronautics and Space Administration, other Fed-

1 eral agencies, private sector enterprises, and nonprofit or-  
 2 ganizations, in the development and implementation of the  
 3 AI Grand Challenges Program and related prize competi-  
 4 tions, including on the requirements under subsection (e).

5 (e) REQUIREMENTS.—

6 (1) IN GENERAL.—The Director shall develop  
 7 requirements for—

8 (A) the prize competition process, includ-  
 9 ing eligibility criteria for participants, con-  
 10 sistent with the requirements under paragraph  
 11 (2); and

12 (B) testing, judging, and verification pro-  
 13 cedures for submissions to receive a prize award  
 14 under the AI Grand Challenges Program.

15 (2) ELIGIBILITY REQUIREMENT AND JUDG-  
 16 ING.—

17 (A) ELIGIBILITY.—In accordance with the  
 18 requirement described in section 24(g)(3) of the  
 19 Stevenson-Wydler Technology Innovation Act of  
 20 1980 (15 U.S.C. 3719(g)(3)), a recipient of a  
 21 prize award under the AI Grand Challenges  
 22 Program—

23 (i) that is a private entity shall be in-  
 24 corporated in and maintain a primary  
 25 place of business in the United States; and

1                   (ii) who is an individual, whether par-  
2                   ticipating singly or in a group, shall be a  
3                   citizen or permanent resident of the United  
4                   States.

5                   (B) JUDGES.—In accordance with section  
6                   24(k) of the Stevenson-Wydler Technology In-  
7                   novation Act of 1980 (15 U.S.C. 3719(k)), a  
8                   judge of a prize competition under the AI  
9                   Grand Challenges Program may be an indi-  
10                  vidual from the private sector.

11               (f) PRIZE AMOUNT.—

12               (1) IN GENERAL.—In carrying out the AI  
13               Grand Challenges Program, the Director—

14               (A) shall award not less than \$1,000,000  
15               in cash prize awards to each winner of the prize  
16               competitions, except as provided in subsection  
17               (c)(3); and

18               (B) may also utilize non-cash awards.

19               (2) LARGER AWARDS.—The Director may  
20               award prizes under the AI Grand Challenges Pro-  
21               gram that are more than \$50,000,000, pursuant to  
22               the requirements under section 24(m)(4)(A) of the  
23               Stevenson-Wydler Technology Innovation Act of  
24               1980 (15 U.S.C. 3719(m)(4)(A)).

25               (g) FUNDING.—



1           (1) IN GENERAL.—In accordance with section  
2           24(m)(1) of the Stevenson-Wydler Technology Inno-  
3           vation Act of 1980 (15 U.S.C. 3719(m)(1)), the Di-  
4           rector may request and accept funds from other  
5           Federal agencies, State, United States territory,  
6           local, or Tribal government agencies, for-profit enti-  
7           ties, and nonprofit entities to support the AI Grand  
8           Challenges Program.

9           (2) PROHIBITION ON CONSIDERATION FOR SUP-  
10          PORT.—The Director may not consider any support  
11          provided by an agency or entity under paragraph (1)  
12          in determining the winners of prize awards under  
13          subsection (b).

14          (h) REPORTS.—

15          (1) NOTIFICATION OF WINNING SUBMISSION.—  
16          Not later than 60 days after the date on which a  
17          prize is awarded under the AI Grand Challenges  
18          Program, the Director shall submit to the Com-  
19          mittee on Commerce, Science, and Transportation of  
20          the Senate, the Committee on Science, Space, and  
21          Technology of the House of Representatives, and  
22          other relevant committees of Congress a report that  
23          describes the winning submission to the prize com-  
24          petition and its benefits to the United States.

25          (2) BIENNIAL REPORT.—

1 (A) IN GENERAL.—Not later than 2 years  
2 after the date of enactment of this Act, and bi-  
3 ennially thereafter, the Director shall submit to  
4 the Committee on Commerce, Science, and  
5 Transportation of the Senate, the Committee on  
6 Science, Space, and Technology of the House of  
7 Representatives, and other relevant committees  
8 of Congress a report that includes—

9 (i) a description of the activities car-  
10 ried out under this Act;

11 (ii) a description of the active com-  
12 petitions and the results of completed com-  
13 petitions under the AI Grand Challenges  
14 Program; and

15 (iii) efforts to provide information to  
16 the public about the AI Grand Challenges  
17 Program to encourage participation.

18 (B) PUBLIC ACCESSIBILITY.—The Director  
19 shall make the biennial report required under  
20 subparagraph (A) publicly accessible, including  
21 by posting the biennial report on the website of  
22 the National Science Foundation in an easily  
23 accessible location.

24 (i) ACCESSIBILITY.—In carrying out the AI Grand  
25 Challenges Program, the Director shall post the active

1 prize competitions and available prize awards under sub-  
2 section (b) to Challenge.gov after the grand challenges are  
3 selected and the prize competitions are designed pursuant  
4 to subsections (c) and (e) to ensure the prize competitions  
5 are widely accessible to eligible participants.

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