

118TH CONGRESS  
1ST SESSION

# S. 2450

To improve coordination between the Department of Energy and the National Science Foundation on activities carried out under the National Quantum Initiative Program, and for other purposes.

---

## IN THE SENATE OF THE UNITED STATES

JULY 20, 2023

Mrs. BLACKBURN (for herself and Mr. PETERS) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

---

## A BILL

To improve coordination between the Department of Energy and the National Science Foundation on activities carried out under the National Quantum Initiative Program, and for other purposes.

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

3 **SECTION 1. COORDINATION BETWEEN DEPARTMENT OF**  
4 **ENERGY AND NATIONAL SCIENCE FOUNDA-**  
5 **TION ON ACTIVITIES UNDER NATIONAL**  
6 **QUANTUM INITIATIVE.**

7 (a) IN GENERAL.—Section 102 of the National  
8 Quantum Initiative Act (15 U.S.C. 8812) is amended—

1           (1) by redesignating subsection (c) as sub-  
2           section (d); and

3           (2) by inserting after subsection (b) the fol-  
4           lowing:

5           “(c) LIAISON BETWEEN DEPARTMENT OF ENERGY  
6 AND NATIONAL SCIENCE FOUNDATION.—The Director of  
7 the Coordination Office shall appoint a member of the  
8 staff of the Coordination Office to serve as a liaison be-  
9 tween the Department of Energy and the National Science  
10 Foundation to ensure the coordination, and avoid unneces-  
11 sary duplication, of the Department and the Foundation  
12 activities under the Program.”.

13          (b) SENSE OF CONGRESS.—It is the sense of Con-  
14 gress that activities and research carried out by the De-  
15 partment of Energy and the National Science Foundation  
16 should include, to the extent practicable, all quantum in-  
17 formation science technologies, as well as critical quan-  
18 tum-enabling technologies, including—

19           (1) gate-based quantum computing;

20           (2) annealing-based quantum computing;

21           (3) quantum bit (qubit) technologies, including

22           those based on—

23                   (A) topological materials;

24                   (B) photons;

25                   (C) trapped ions;

- 1 (D) neutral atoms;
- 2 (E) silicon;
- 3 (F) superconducting devices; and
- 4 (G) any other viable quantum technology;
- 5 and
- 6 (4) quantum-enabling technologies, including—
- 7 (A) single photon sources;
- 8 (B) lasers;
- 9 (C) radio frequency, microwave, and other
- 10 electronics;
- 11 (D) electron spin;
- 12 (E) cryogenic technologies;
- 13 (F) low-disorder or low-defect materials de-
- 14 velopment and fabrication; and
- 15 (G) any other critical enabling technology.

16 **SEC. 2. ESTABLISHMENT OF MANUFACTURING USA INSTI-**

17 **TUTE FOR QUANTUM MANUFACTURING.**

18 (a) DEFINITION OF MANUFACTURING USA INSTI-

19 TUTE.—In this section, the term “Manufacturing USA in-

20 stitute” has the meaning given such term in section 34(d)

21 of the National Institute of Standards and Technology Act

22 (15 U.S.C. 278s(d)).

23 (b) ESTABLISHMENT OF MANUFACTURING USA IN-

24 STITUTE.—The Secretary of Commerce, acting through

25 the Director of the National Institute of Standards and

1 Technology, and in consultation with the Secretary of En-  
2 ergy, shall—

3 (1) determine the manufacturing capabilities  
4 necessary to produce reliable quantum components  
5 and systems at scale and the gaps in access to such  
6 capabilities; and

7 (2) establish, or award financial assistance,  
8 under section 34(e)(1) of the National Institute of  
9 Standards and Technology Act (15 U.S.C.  
10 278s(e)(1)) to plan, establish, or support, a Manu-  
11 facturing USA institute that—

12 (A) provides an end-to-end manufacturing  
13 ecosystem addressing quantum computing,  
14 quantum sensing, and quantum communication;

15 (B) includes within the end-to-end eco-  
16 system provided pursuant to paragraph (1) the  
17 capability to design, fabricate, and test mate-  
18 rials, devices, structures, and manufacturing  
19 processes for quantum technologies or systems,  
20 as well as the capacity to develop and create  
21 jobs for a coordinated advanced manufacturing  
22 and quantum engineering workforce;

23 (C) provides access to prototyping, both at  
24 research scale and commercial scale, for re-  
25 searchers and developers working on quantum

1 component technologies and systems and manu-  
2 facturing process innovations to facilitate the  
3 transition into scalable, cost-effective, and high-  
4 performing manufacturing capabilities;

5 (D) supports the development of a resilient  
6 quantum supply chain with an emphasis on key  
7 components and supply from allies of the  
8 United States, that enables quantum tech-  
9 nologies, and increases the domestic production  
10 of goods critical to national security and eco-  
11 nomic competitiveness; and

12 (E) supports development of a workforce  
13 with skills relevant to manufacture of quantum  
14 components and systems.

15 **SEC. 3. STUDIES RELATING TO NATIONAL QUANTUM INI-**  
16 **TIATIVE PROGRAM.**

17 (a) INDEPENDENT STUDY ON PROGRESS MADE BY  
18 NATIONAL QUANTUM INITIATIVE PROGRAM.—

19 (1) AGREEMENT.—The Director of the Office of  
20 Science and Technology Policy shall seek to enter  
21 into an agreement with the National Academies of  
22 Sciences, Engineering, and Medicine (in this sub-  
23 section the “National Academies”) to perform the  
24 services covered by this section.

1           (2) INDEPENDENT STUDY.—Under an agree-  
2           ment between the Director and the National Acad-  
3           emies under this subsection, the National Academies  
4           shall carry out an independent study to assess the  
5           progress made by the National Quantum Initiative  
6           Program in achieving the purposes set forth under  
7           section 3 of the National Quantum Initiative Act (15  
8           U.S.C. 8802) and the goals of the Program, includ-  
9           ing with respect to sensing, communications, com-  
10          puting, and workforce development for near-term de-  
11          velopment and quantum applications.

12          (b) STUDY ON IMPEDIMENTS TO COLLABORATION  
13          UNDER NATIONAL QUANTUM INITIATIVE PROGRAM.—

14               (1) STUDY AND REPORT.—Not later than 180  
15               days after the date of the enactment of this Act, the  
16               consortium convened by the Director of the National  
17               Institute of Standards and Technology pursuant to  
18               section 201(b)(1) of the National Quantum Initiative  
19               Act (15 U.S.C. 8831(b)(1)) shall—

20                       (A) conduct a study—

21                               (i) on the impediments to collabora-  
22                               tion under the National Quantum Initia-  
23                               tive Program implemented pursuant to sec-  
24                               tion 101(a) of such Act (15 U.S.C.  
25                               8811(a)) between Multidisciplinary Centers

1 for Quantum Research and Education es-  
2 tablished under section 302(a) of such Act  
3 (15 U.S.C. 8842(a)), National Quantum  
4 Information Science Research Centers es-  
5 tablished and operated pursuant to section  
6 402(a)(1) of such Act (15 U.S.C.  
7 8852(a)(1)), industry, and academia; and

8 (ii) to develop recommendations for  
9 legislative action to eliminate or mitigate  
10 such impediments; and

11 (B) submit to the Committee on Com-  
12 merce, Science, and Transportation of the Sen-  
13 ate and the Committee on Science, Space, and  
14 Technology of the House of Representatives a  
15 report on the findings of the consortium with  
16 respect to the study conducted pursuant to  
17 paragraph (1).

18 (2) CONTENTS.—The report submitted under  
19 paragraph (1)(B) shall include the following:

20 (A) An overview of the current state of re-  
21 search being conducted under the National  
22 Quantum Initiative Program.

23 (B) A breakdown of the funding under the  
24 Program for near-term quantum applications  
25 development, disaggregated by different quan-

1 tum technologies, including computing (anneal-  
2 ing and gate-model with the different types of  
3 qubit technologies), sensing, communication,  
4 and networking.

5 (C) Identification of potential risks in the  
6 research funded under the Program.

○