

115TH CONGRESS  
2D SESSION

# S. 3673

To require the Secretary of Energy to carry out quantum information science research, and for other purposes.

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## IN THE SENATE OF THE UNITED STATES

NOVEMBER 28, 2018

Ms. MURKOWSKI (for herself, Ms. CANTWELL, Mr. DAINES, Mr. GARDNER, Ms. HARRIS, and Mr. HEINRICH) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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## A BILL

To require the Secretary of Energy to carry out quantum information science research, 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. SHORT TITLE.**

4 This Act may be cited as the “Department of Energy  
5 Quantum Information Science Research Act”.

1 **SEC. 2. QUANTUM INFORMATION SCIENCE RESEARCH PRO-**  
2 **GRAM.**

3 (a) IN GENERAL.—The Secretary of Energy shall  
4 carry out a basic research program on quantum informa-  
5 tion science.

6 (b) PROGRAM COMPONENTS.—In carrying out the  
7 program required under subsection (a), the Secretary  
8 shall—

9 (1) formulate goals for quantum information  
10 science research to be supported by the Department  
11 of Energy;

12 (2) leverage the collective body of knowledge  
13 from existing quantum information science research;

14 (3) provide research experiences and training  
15 for additional undergraduate and graduate students  
16 in quantum information science, including in the  
17 fields of—

18 (A) quantum information theory;

19 (B) quantum physics;

20 (C) quantum computational science;

21 (D) applied mathematics and algorithm de-  
22 velopment;

23 (E) quantum networking;

24 (F) quantum sensing and detection; and

25 (G) materials science and engineering;

1           (4) coordinate research efforts funded through  
2 existing programs across the Department, including  
3 the National Laboratories, the Advanced Research  
4 Projects Agency–Energy, the Energy Frontier Re-  
5 search Centers, the Nanoscale Science Research  
6 Centers, the Energy Innovation Hubs, and the Na-  
7 tional Quantum Information Science Research Cen-  
8 ters established under section 3; and

9           (5) coordinate with other Federal agencies, re-  
10 search communities, and potential users of informa-  
11 tion produced under this section.

12 **SEC. 3. NATIONAL QUANTUM INFORMATION SCIENCE RE-**  
13 **SEARCH CENTERS.**

14 (a) ESTABLISHMENT.—

15           (1) IN GENERAL.—The Secretary of Energy,  
16 acting through the Director of the Office of Science  
17 (referred to in this section as the “Director”) shall  
18 ensure that the Office of Science carries out a pro-  
19 gram, in consultation with other Federal agencies,  
20 as appropriate, to establish and operate at least 2,  
21 but not more than 5, research centers to be known  
22 as “National Quantum Information Science Re-  
23 search Centers” to conduct basic research to accel-  
24 erate scientific breakthroughs in quantum informa-  
25 tion science and technology and to support research

1 conducted under the program established in section  
2 2.

3 (2) REQUIREMENTS.—Such centers shall be es-  
4 tablished through a competitive, merit-reviewed proc-  
5 ess, and applicants shall submit to the Director an  
6 application at such time, in such manner, and con-  
7 taining such information as the Director determines  
8 to be appropriate. The Director shall consider appli-  
9 cations from National Laboratories, institutions of  
10 higher education, research centers, multi-institu-  
11 tional collaborations, and any other entity that the  
12 Secretary determines to be appropriate.

13 (b) COLLABORATIONS.—A collaboration that receives  
14 assistance under this section may include multiple types  
15 of research institutions and private sector entities.

16 (c) REQUIREMENTS.—To the maximum extent prac-  
17 ticable, the Centers developed, constructed, operated, or  
18 maintained under this section shall serve the needs of the  
19 Department of Energy, industry, the academic commu-  
20 nity, and other relevant entities to create and develop  
21 processes for the purpose of advancing basic research in  
22 quantum information science and improving the competi-  
23 tiveness of the United States.

24 (d) COORDINATION.—The Secretary shall ensure the  
25 coordination, and avoid unnecessary duplication, of the ac-

1 tivities of each National Quantum Information Science  
2 Research Center with the activities of—

3 (1) other research entities of the Department,  
4 including—

5 (A) the Nanoscale Science Research Cen-  
6 ters;

7 (B) the Energy Frontier Research Centers;

8 (C) the Energy Innovation Hubs;

9 (D) the National Laboratories; and

10 (E) institutions of higher education; and

11 (2) industry.

12 (e) SELECTION AND DURATION.—

13 (1) IN GENERAL.—The centers selected and es-  
14 tablished under this section are authorized to carry  
15 out activities for a period of 5 years.

16 (2) REAPPLICATION AND APPROVAL.—An  
17 awardee may reapply for additional, subsequent peri-  
18 ods of 5 years. The Director shall approve or dis-  
19 approve of an application on a competitive, merit-re-  
20 viewed basis.

21 (3) TERMINATION.—Consistent with the exist-  
22 ing authorities of the Department, the Secretary  
23 may terminate an underperforming Center for cause  
24 during the performance period.

1       (f) FUNDING.—There is authorized to be appro-  
2       priated to the Department of Energy for each of fiscal  
3       years 2019 through 2023, up to \$25,000,000 for each  
4       Center established under this section, subject to the avail-  
5       ability of appropriations. This section shall be carried out  
6       using funds otherwise appropriated by law after the date  
7       of enactment of this Act.

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