

114TH CONGRESS  
1ST SESSION

# H. R. 4066

To enable high-performance computation and supportive research and nuclear energy innovation.

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IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 18, 2015

Mr. GRAYSON introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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## A BILL

To enable high-performance computation and supportive research and nuclear energy innovation.

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 “Nuclear Innovation  
5 Act”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

8 (1) **ADVANCED FISSION REACTOR.**—The term  
9 “advanced fission reactor” means a nuclear fission  
10 reactor with significant improvements over the most

1 recent generation of nuclear reactors, which may in-  
2 clude inherent safety features, lower waste yields,  
3 greater fuel utilization, superior reliability, resist-  
4 ance to proliferation, and increased thermal effi-  
5 ciency.

6 (2) DEPARTMENT.—The term “Department”  
7 means the Department of Energy.

8 (3) NATIONAL LABORATORIES.—The term “Na-  
9 tional Laboratories” has the meaning given the term  
10 in section 2 of the Energy Policy Act of 2005 (42  
11 U.S.C. 15801).

12 (4) SECRETARY.—The term “Secretary” means  
13 the Secretary of Energy.

14 **SEC. 3. HIGH-PERFORMANCE COMPUTATION AND SUP-**  
15 **PORTIVE RESEARCH.**

16 (a) MODELING AND SIMULATION.—The Secretary  
17 shall carry out a program to enhance the Nation’s capa-  
18 bilities to develop new reactor technologies through high-  
19 performance computation modeling and simulation tech-  
20 niques. This program shall coordinate with relevant Fed-  
21 eral agencies through the National Strategic Computing  
22 Initiative created under Executive Order 13702 (July 29,  
23 2015) while taking into account the following objectives:

24 (1) Utilizing expertise from the private sector,  
25 universities, and National Laboratories to develop

1 computational software and capabilities that pro-  
2 spective users may access to accelerate research and  
3 development of advanced fission reactor systems, nu-  
4 clear fusion systems, and reactor systems for space  
5 exploration.

6 (2) Developing computational tools to simulate  
7 and predict nuclear phenomena that may be vali-  
8 dated through physical experimentation.

9 (3) Increasing the utility of the Department's  
10 research infrastructure by coordinating with the Ad-  
11 vanced Scientific Computing Research program  
12 within the Office of Science.

13 (4) Leveraging experience from the Energy In-  
14 novation Hub for Modeling and Simulation.

15 (5) Ensuring that new experimental and com-  
16 putational tools are accessible to relevant research  
17 communities.

18 (b) SUPPORTIVE RESEARCH ACTIVITIES.—The Sec-  
19 retary shall consider support for additional research activi-  
20 ties to maximize the utility of its research facilities, includ-  
21 ing physical processes to simulate degradation of materials  
22 and behavior of fuel forms and for validation of computa-  
23 tional tools.

1 **SEC. 4. ENABLING NUCLEAR ENERGY INNOVATION.**

2 (a) NATIONAL REACTOR INNOVATION CENTER.—The  
3 Secretary shall carry out a program to enable the testing  
4 and demonstration of reactor concepts to be proposed and  
5 funded by the private sector. The Secretary shall leverage  
6 the technical expertise of relevant Federal agencies and  
7 National Laboratories in order to minimize the time re-  
8 quired to enable construction and operation of privately  
9 funded experimental reactors at National Laboratories or  
10 other Department-owned sites while ensuring reasonable  
11 safety for persons working within these sites. Such reac-  
12 tors shall operate to meet the following objectives:

13 (1) Enabling physical validation of novel reactor  
14 concepts.

15 (2) Resolving technical uncertainty and increas-  
16 ing practical knowledge relevant to safety, resilience,  
17 security, and functionality of first-of-a-kind reactor  
18 concepts.

19 (3) General research and development to im-  
20 prove nascent technologies.

21 (b) REPORTING REQUIREMENT.—Not later than 180  
22 days after the date of enactment of this Act, the Sec-  
23 retary, in consultation with the National Laboratories, rel-  
24 evant Federal agencies, and other stakeholders, shall  
25 transmit to the Committee on Science, Space, and Tech-  
26 nology of the House of Representatives and the Committee

1 on Energy and Natural Resources of the Senate a report  
2 assessing the Department's capabilities to authorize, host,  
3 and oversee privately funded fusion and advanced fission  
4 experimental reactors as described under subsection (a).

5 The report shall address the following:

6 (1) The Department's safety review and over-  
7 sight capabilities, including options to leverage ex-  
8 pertise from the Nuclear Regulatory Commission  
9 and National Laboratories.

10 (2) Potential sites capable of hosting activities  
11 described under subsection (a).

12 (3) The efficacy of the Department's available  
13 contractual mechanisms to partner with the private  
14 sector and Federal agencies, including cooperative  
15 research and development agreements, strategic  
16 partnership projects, and agreements for commer-  
17 cializing technology.

18 (4) Potential cost structures related to physical  
19 security, decommissioning, liability, and other long  
20 term project costs.

21 (5) Other challenges or considerations identified  
22 by the Secretary.

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