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(Original Signature of Member)

115TH CONGRESS
1ST SESSION

H. R. _____

To direct the Secretary of Energy to carry out certain upgrades to research equipment and the construction of a research user facility, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. KNIGHT introduced the following bill; which was referred to the Committee on _____

A BILL

To direct the Secretary of Energy to carry out certain upgrades to research equipment and the construction of a research user facility, 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 Research Infrastructure Act of 2017”.

6 **SEC. 2. ADVANCED LIGHT SOURCE UPGRADE.**

7 (a) IN GENERAL.—The Secretary of Energy shall
8 provide for the upgrade to the Advanced Light Source de-

1 scribed in the publication approved by the Basic Energy
2 Sciences Advisory Committee on June 9, 2016, titled “Re-
3 port on Facility Upgrades”, including the development of
4 a multi-bend achromat lattice to produce a high flux of
5 coherent x-rays within the soft x-ray energy region.

6 (b) DEFINITIONS.—In this section:

7 (1) FLUX.—The term “flux” means the rate of
8 flow of photons.

9 (2) SOFT X-RAY.—The term “soft x-ray” means
10 a photon with energy in the range from 50 to 2,000
11 electron volts.

12 (c) START OF OPERATIONS.—The Secretary shall, to
13 the maximum extent practicable, ensure that the start of
14 full operations of the upgrade under this section occurs
15 before December 31, 2026.

16 (d) FUNDING.—Out of funds appropriated to the Of-
17 fice of Science, there shall be made available to the Sec-
18 retary to carry out the upgrade under this section—

19 (1) \$20,000,000 for fiscal year 2018;

20 (2) \$50,000,000 for fiscal year 2019;

21 (3) \$80,000,000 for fiscal year 2020;

22 (4) \$80,000,000 for fiscal year 2021;

23 (5) \$52,000,000 for fiscal year 2022;

24 (6) \$22,000,000 for fiscal year 2023; and

25 (7) \$6,000,000 for fiscal year 2024.

1 **SEC. 3. LINAC COHERENT LIGHT SOURCE II HIGH ENERGY**
2 **UPGRADE.**

3 (a) **IN GENERAL.**—The Secretary of Energy shall
4 provide for the upgrade to the Linac Coherent Light
5 Source II facility described in the publication approved by
6 the Basic Energy Sciences Advisory Committee on June
7 9, 2016, titled “Report on Facility Upgrades”, including
8 the development of experimental capabilities for high en-
9 ergy x-rays to reveal fundamental scientific discoveries.
10 The Secretary shall ensure the upgrade under this section
11 enables the production and use of high energy, ultra-short
12 pulse x-rays delivered at a high repetition rate.

13 (b) **DEFINITIONS.**—In this section:

14 (1) **HIGH ENERGY X-RAY.**—The term a “high
15 energy x-ray” means a photon with an energy at or
16 exceeding 12 kiloelectron volts.

17 (2) **HIGH REPETITION RATE.**—The term “high
18 repetition rate” means the delivery of x-ray pulses
19 up to one million pulses per second.

20 (3) **ULTRA-SHORT PULSE X-RAYS.**—The term
21 “ultra-short pulse x-rays” means x-ray bursts capa-
22 ble of durations of less than one hundred
23 femtoseconds.

24 (c) **START OF OPERATIONS.**—The Secretary shall, to
25 the maximum extent practicable, ensure that the start of

1 full operations of the upgrade under this section occurs
2 before December 31, 2025.

3 (d) FUNDING.—Out of funds appropriated to the Of-
4 fice of Science, there shall be made available to the Sec-
5 retary to carry out the upgrade under this section—

6 (1) \$20,000,000 for fiscal year 2018;

7 (2) \$55,000,000 for fiscal year 2019;

8 (3) \$80,000,000 for fiscal year 2020;

9 (4) \$80,000,000 for fiscal year 2021;

10 (5) \$54,000,000 for fiscal year 2022; and

11 (6) \$31,000,000 for fiscal year 2023.

12 **SEC. 4. FACILITY FOR RARE ISOTOPE BEAMS.**

13 (a) IN GENERAL.—The Secretary of Energy shall
14 provide for a Facility for Rare Isotope Beams to advance
15 the understanding of rare nuclear isotopes and the evo-
16 lution of the cosmos.

17 (b) FACILITY CAPABILITY.—In carrying out sub-
18 section (a), the Secretary shall provide for, at a minimum,
19 a rare isotope beam facility capable of 400 kW of beam
20 power.

21 (c) START OF OPERATIONS.—The Secretary shall, to
22 the maximum extent practicable, ensure that the start of
23 full operations of the facility under this section occurs be-
24 fore June 30, 2022, with early operation in 2018.

1 (d) FUNDING.—Out of funds appropriated to the Of-
2 fice of Science, there shall be made available to the Sec-
3 retary to carry out activities, including construction of the
4 facility, under this section—

5 (1) \$101,000,000 for fiscal year 2018;

6 (2) \$103,000,000 for fiscal year 2019;

7 (3) \$104,000,000 for fiscal year 2020;

8 (4) \$105,000,000 for fiscal year 2021; and

9 (5) \$106,000,000 for fiscal year 2022.