

113TH CONGRESS  
1ST SESSION

# S. 1317

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2014 through 2016 and for other purposes.

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IN THE SENATE OF THE UNITED STATES

JULY 17, 2013

Mr. NELSON (for himself and Mr. ROCKEFELLER) 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 programs of the National Aeronautics and Space Administration for fiscal years 2014 through 2016 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; TABLE OF CONTENTS.**

4 (a) SHORT TITLE.—This Act may be cited as the  
5 “National Aeronautics and Space Administration Author-  
6 ization Act of 2013”.

7 (b) TABLE OF CONTENTS.—The table of contents of  
8 this Act is as follows:

Sec. 1. Short title; table of contents.

Sec. 2. Findings.

Sec. 3. Definitions.

TITLE I—AUTHORIZATION OF APPROPRIATIONS

Sec. 101. Fiscal year 2014.

Sec. 102. Fiscal year 2015.

Sec. 103. Fiscal year 2016.

TITLE II—HUMAN SPACE FLIGHT EXPLORATION AND OPERATIONS

Subtitle A—Exploration

Sec. 201. Missions and destinations.

Sec. 202. NASA processing and launch infrastructure.

Sec. 203. Naming of the space launch system.

Sec. 204. Report; space suit system.

Subtitle B—Maximizing ISS Utilization

Sec. 221. Operation and utilization of the ISS.

Sec. 222. Research roles and responsibilities.

Sec. 223. ISS national laboratory; property rights in inventions.

Sec. 224. Commercial cargo and crew capabilities.

Subtitle C—Other Matters

Sec. 231. Safety and mission assurance in human space flight.

Sec. 232. Launch liability provisions.

TITLE III—SCIENCE

Subtitle A—Earth Science

Sec. 301. Earth science.

Subtitle B—Space Science

Sec. 321. Human exploration and science collaboration.

Sec. 322. Maintaining a balanced space science portfolio.

Sec. 323. Science mission extensions.

Sec. 324. Planetary science.

Sec. 325. Space weather.

Sec. 326. James Webb space telescope.

Sec. 327. University class science missions.

TITLE IV—AERONAUTICS

Sec. 401. Sense of Congress on NASA aeronautics.

TITLE V—SPACE TECHNOLOGY

Sec. 501. Space technology.

TITLE VI—EDUCATION

Sec. 601. Education and outreach activities.

TITLE VII—OTHER MATTERS

Sec. 701. Sense of Congress on NASA's cross agency support.  
Sec. 702. Space communications network.  
Sec. 703. Astronaut occupational healthcare.  
Sec. 704. Helium capture and recovery.  
Sec. 705. Information technology governance.  
Sec. 706. Improvements to baselines and cost controls breach reporting process.  
Sec. 707. Infrastructure.  
Sec. 708. Knowledge management.

1 **SEC. 2. FINDINGS.**

2 Congress makes the following findings:

3 (1) A robust and balanced space program en-  
4 hances the United States long-term national and  
5 economic security by—

6 (A) stimulating development of advanced  
7 technologies with widespread applications;

8 (B) increasing the United States techno-  
9 logical competitiveness;

10 (C) enhancing global prosperity and secu-  
11 rity through cooperation in shared interests,  
12 such as advancement of science, understanding  
13 of Earth and the universe, and protection from  
14 space borne threats, such as asteroids;

15 (D) opening the solar system to the full  
16 range of peaceful human activity; and

17 (E) inspiring students to pursue disciplines  
18 in science, technology, engineering, and mathe-  
19 matics.

20 (2) The Nation's space program should in-  
21 clude—

1 (A) national security and civil space activi-  
2 ties;

3 (B) robotic and human exploration;

4 (C) advancement of scientific knowledge  
5 and engagement of the general public;

6 (D) U.S. Government led launch capability  
7 development, including the Space Launch Sys-  
8 tem and the Orion multi-purpose crew vehicle,  
9 and partnerships with commercial and inter-  
10 national entities;

11 (E) advancement of the space frontier and  
12 stimulation of commerce; and

13 (F) searching outward to further our un-  
14 derstanding of the universe and observing  
15 Earth to expand knowledge of our home planet.

16 **SEC. 3. DEFINITIONS.**

17 In this Act:

18 (1) ADMINISTRATION.—The term “Administra-  
19 tion” means the National Aeronautics and Space  
20 Administration.

21 (2) ADMINISTRATOR.—The term “Adminis-  
22 trator” means the Administrator of the National  
23 Aeronautics and Space Administration.

1           (3) APPROPRIATE COMMITTEES OF CON-  
2           GRESS.—The term “appropriate committees of Con-  
3           gress” means—

4                   (A) the Committee on Commerce, Science,  
5                   and Transportation of the Senate; and

6                   (B) the Committee on Science, Space, and  
7                   Technology of the House of Representatives.

8           (4) ISS.—The term “ISS” means the Inter-  
9           national Space Station.

10           (5) NASA.—The term “NASA” means the Na-  
11           tional Aeronautics and Space Administration.

12           (6) ORION.—The term “Orion” means the  
13           multi-purpose crew vehicle described under section  
14           303 of the National Aeronautics and Space Adminis-  
15           tration Authorization Act of 2010 (42 U.S.C.  
16           18323).

17           (7) SPACE LAUNCH SYSTEM.—The term “Space  
18           Launch System” has the meaning given the term  
19           under section 3 of the National Aeronautics and  
20           Space Administration Authorization Act of 2010 (42  
21           U.S.C. 18302).

1       **TITLE I—AUTHORIZATION OF**  
2                   **APPROPRIATIONS**

3       **SEC. 101. FISCAL YEAR 2014.**

4           There are authorized to be appropriated to NASA for  
5 fiscal year 2014, \$18,100,000,000, as follows:

6           (1) For Exploration, \$4,275,000,000, of  
7 which—

8                   (A) \$1,600,000,000 shall be for Space  
9 Launch System;

10                   (B) \$1,200,000,000 shall be for the Orion  
11 multi-purpose crew vehicle;

12                   (C) \$350,000,000 shall be for Exploration  
13 Ground Systems;

14                   (D) \$325,000,000 shall be for Exploration  
15 Research and Development; and

16                   (E) \$800,000,000 shall be for Commercial  
17 Space Flight.

18           (2) For Space Operations, \$3,832,000,000, of  
19 which—

20                   (A) \$3,000,000,000 shall be for the ISS  
21 program; and

22                   (B) \$832,000,000 for Space and Flight  
23 Support.

24           (3) For Science, \$5,154,000,000, of which—

1 (A) \$1,800,000,000 shall be for Earth  
2 Sciences;

3 (B) \$1,400,000,000 shall be for Planetary  
4 Science;

5 (C) \$642,000,000 shall be for Astro-  
6 physics;

7 (D) \$658,000,000 shall be for the James  
8 Webb Space Telescope; and

9 (E) \$654,000,000 shall be for  
10 Heliophysics.

11 (4) For Aeronautics, \$570,000,000.

12 (5) For Space Technology, \$635,000,000.

13 (6) For Education, \$136,000,000.

14 (7) For Cross-Agency Support Programs,  
15 \$2,850,000,000.

16 (8) For Construction and Environmental Com-  
17 pliance and Restoration, \$610,000,000.

18 (9) For Inspector General, \$38,000,000.

19 **SEC. 102. FISCAL YEAR 2015.**

20 There are authorized to be appropriated to NASA for  
21 fiscal year 2015, \$18,462,000,000, as follows

22 (1) For Exploration, \$4,522,000,000, of  
23 which—

24 (A) \$1,725,000,000 shall be for Space  
25 Launch System;

1 (B) \$1,225,000,000 shall be for the Orion  
2 multi-purpose crew vehicle;

3 (C) \$425,000,000 shall be for Exploration  
4 Ground Systems;

5 (D) \$332,000,000 shall be for Exploration  
6 Research and Development; and

7 (E) \$815,000,000 shall be for Commercial  
8 Space Flight.

9 (2) For Space Operations, \$3,948,000,000, of  
10 which—

11 (A) \$3,103,000,000 shall be for the ISS  
12 program; and

13 (B) \$845,000,000 for Space and Flight  
14 Support.

15 (3) For Science, \$5,234,400,000, of which—

16 (A) \$1,836,000,000 shall be for Earth  
17 Sciences;

18 (B) \$1,450,000,000 shall be for Planetary  
19 Science;

20 (C) \$670,000,000 shall be for Astro-  
21 physics;

22 (D) \$645,400,000 shall be for the James  
23 Webb Space Telescope; and

24 (E) \$633,000,000 shall be for  
25 Heliophysics.

1 (4) For Aeronautics, \$581,000,000.

2 (5) For Space Technology, \$650,000,000.

3 (6) For Education, \$139,800,000.

4 (7) For Cross-Agency Support Programs,  
5 \$2,907,000,000.

6 (8) For Construction and Environmental Com-  
7 pliance and Restoration, \$441,000,000.

8 (9) For Inspector General, \$38,800,000.

9 **SEC. 103. FISCAL YEAR 2016.**

10 There are authorized to be appropriated to NASA for  
11 fiscal year 2016, \$18,831,000,000, as follows:

12 (1) For Exploration, \$4,660,000,000, of  
13 which—

14 (A) \$1,800,000,000 shall be for Space  
15 Launch System;

16 (B) \$1,250,000,000 shall be for the Orion  
17 multi-purpose crew vehicle;

18 (C) \$435,000,000 shall be for Exploration  
19 Ground Systems;

20 (D) \$350,000,000 shall be for Exploration  
21 Research and Development; and

22 (E) \$825,000,000 shall be for Commercial  
23 Space Flight.

24 (2) For Space Operations, \$4,010,000,000, of  
25 which—

1 (A) \$3,196,000,000 shall be for the ISS  
2 program; and

3 (B) \$814,000,000 for Space and Flight  
4 Support.

5 (3) For Science, \$5,315,800,000, of which—

6 (A) \$1,872,000,000 shall be for Earth  
7 Sciences;

8 (B) \$1,500,000,000 shall be for Planetary  
9 Science;

10 (C) \$686,800,000 shall be for Astro-  
11 physics;

12 (D) \$620,000,000 shall be for the James  
13 Webb Space Telescope; and

14 (E) \$637,000,000 shall be for  
15 Heliophysics.

16 (4) For Aeronautics, \$593,000,000.

17 (5) For Space Technology, \$665,000,000.

18 (6) For Education, \$142,000,000.

19 (7) For Cross-Agency Support Programs,  
20 \$2,965,000,000.

21 (8) For Construction and Environmental Com-  
22 pliance and Restoration, \$441,000,000.

23 (9) For Inspector General, \$39,200,000.

1 **TITLE II—HUMAN SPACE FLIGHT**  
2 **EXPLORATION AND OPER-**  
3 **ATIONS**

4 **Subtitle A—Exploration**

5 **SEC. 201. MISSIONS AND DESTINATIONS.**

6 (a) IN GENERAL.—Congress reaffirms that the long-  
7 term goal of the human space flight and exploration ef-  
8 forts of NASA shall be to expand permanent human pres-  
9 ence beyond low-Earth orbit and to do so, where practical,  
10 in a manner involving international partners, as stated in  
11 section 202(a) of the National Aeronautics and Space Ad-  
12 ministration Authorization Act of 2010 (42 U.S.C.  
13 18312(a)).

14 (b) HUMAN EXPLORATION OF MARS.—Section  
15 202(b) of the National Aeronautics and Space Administra-  
16 tion Authorization Act of 2010 (42 U.S.C. 18312(b)) is  
17 amended—

18 (1) by striking “and” at the end of paragraph

19 (3);

20 (2) by striking the period at the end of para-  
21 graph (4) and inserting “; and”; and

22 (3) by adding at the end the following:

23 “(5) to achieve human exploration of Mars, in-  
24 cluding the establishment of a capability for human  
25 habitation on the surface of Mars.”.

1 (c) DEVELOPMENT OF EXPLORATION STRATEGY.—

2 (1) IN GENERAL.—Not later than 270 days  
3 after the date of enactment of this Act, and bienni-  
4 ally thereafter, the Administrator shall submit to the  
5 appropriate committees of Congress a strategy to  
6 achieve the objective under section 202(b)(5) of the  
7 National Aeronautics and Space Administration Au-  
8 thorization Act of 2010, as amended (42 U.S.C.  
9 18312(b)(5)) through a series of successive, free-  
10 standing, but complementary missions making ro-  
11 bust utilization of cis-lunar space and employing the  
12 Space Launch System, Orion, and other capabilities  
13 provided under titles III, IV, V, and IX of that Act  
14 (42 U.S.C. 18301 et seq.).

15 (2) STRATEGY REQUIREMENTS.—In developing  
16 the strategy under paragraph (1), the Administrator  
17 shall include—

18 (A) the utility of an expanded human pres-  
19 ence in cis-lunar space toward enabling mis-  
20 sions to various lunar orbits, the lunar surface,  
21 asteroids, the Mars system, and other destina-  
22 tions of interest for future human exploration  
23 and development;

1 (B) the utility of an expanded human pres-  
2 ence in cis-lunar space for economic, scientific,  
3 and technological advances;

4 (C) the opportunities for collaboration  
5 with—

6 (i) international partners;

7 (ii) private industry; and

8 (iii) other Federal agencies, including  
9 missions relevant to national security or  
10 scientific needs;

11 (D) the opportunities specifically afforded  
12 by the ISS to support high priority scientific  
13 and technological developments useful in ex-  
14 panding and sustaining a human presence in  
15 cis-lunar space and beyond;

16 (E) a range of exploration mission archi-  
17 tectures and approaches for the missions identi-  
18 fied under paragraph (1); and

19 (F) standards for ensuring crew health  
20 and safety, including limits regarding radiation  
21 exposure and countermeasures necessary to  
22 meet those limits, means and methods for ad-  
23 dressing urgent medical conditions or injuries,  
24 and other such safety, health, and medical

1 issues that can be anticipated in the conduct of  
2 the missions identified under paragraph (1).

3 (3) COMPARISON OF MISSION ARCHITECTURES  
4 AND APPROACHES.—

5 (A) IN GENERAL.—The strategy shall in-  
6 clude a comparison of mission architectures and  
7 approaches identified under paragraph (2)(E)  
8 with a primary objective of identifying the ar-  
9 chitectures and approaches that—

10 (i) best support the long-term goal  
11 under section 202(a) of the National Aero-  
12 nautics and Space Administration Author-  
13 ization Act of 2010 (42 U.S.C. 18312(a));  
14 and

15 (ii) are enabled by the Space Launch  
16 System, Orion, and other transportation  
17 capabilities and technologies provided  
18 under titles III, IV, V, and IX of the Na-  
19 tional Aeronautics and Space Administra-  
20 tion Authorization Act of 2010 (42 U.S.C.  
21 18301 et seq.) and by other capabilities  
22 that may be available commercially or  
23 internationally.

24 (B) FACTORS.—The comparison of mission  
25 architectures and approaches under subpara-

1 graph (A) shall include options that assess cost,  
2 schedule, safety, sustainability, opportunities  
3 for international collaboration, the enabling of  
4 new markets and opportunities for U.S. private  
5 industry, compelling scientific opportunities or  
6 national security considerations and require-  
7 ments, the flexibility of the architecture to ad-  
8 just to evolving technologies, leadership, and  
9 priorities, and contributions made to U.S. tech-  
10 nological excellence, competitiveness, and lead-  
11 ership.

12 (C) NATIONAL SECURITY COLLABORA-  
13 TION.—In identifying opportunities for collabo-  
14 ration under paragraph (2)(C)(iii), the Admin-  
15 istrator, in collaboration with the Secretary of  
16 Defense and Director of National Intelligence,  
17 shall include a discussion of the work, cost, and  
18 schedule required to enable and utilize a cargo  
19 variant of the Space Launch System, including  
20 the 70-, 105-, and 130-metric ton configura-  
21 tions, with both a 5-meter or 8-meter faring.

22 (4) ADDITIONAL REQUIREMENTS.—The strat-  
23 egy shall include—

1 (A) technical information as needed to  
2 identify interest from the scientific and national  
3 security communities; and

4 (B) an assessment of the Space Launch  
5 System to enable and sustain near-Earth object  
6 surveillance of potentially Earth-threatening ob-  
7 jects for the purpose of planetary protection.

8 **SEC. 202. NASA PROCESSING AND LAUNCH INFRASTRUC-**  
9 **TURE.**

10 (a) **POLICY.**—It is the policy of the United States  
11 that the Exploration Ground Systems to process and  
12 launch the Space Launch System, Orion, and related ex-  
13 ploration elements, and the 21st Century Space Launch  
14 Complex to enable and facilitate civil, defense, and private  
15 launches are complementary efforts to modernize infra-  
16 structure, reduce costs, and maintain capabilities for cur-  
17 rent and future missions.

18 (b) **DEVELOPMENT OF THE PROCESSING AND**  
19 **LAUNCH SUPPORT INFRASTRUCTURE.**—In executing the  
20 programs described under subsection (a), the Adminis-  
21 trator, to the extent practicable—

22 (1) may not exclude the ability of Exploration  
23 Ground Systems to support efforts under section  
24 305(b) of the National Aeronautics and Space Ad-

1       ministration Authorization Act of 2010 (42 U.S.C.  
2       18325(b));

3           (2) shall allow for cost-sharing opportunities by  
4       providing multi-use systems and capabilities to cur-  
5       rent and future users of the 21st Century Space  
6       Launch Complex through modernization, refurbish-  
7       ment, or development of infrastructure; and

8           (3) shall pursue, in collaboration with local,  
9       State, or Federal agencies, or private industry, capa-  
10      bilities and investments that support multiple enti-  
11      ties to advance NASA’s current and future missions  
12      and benefit NASA by creating new partnerships.

13   **SEC. 203. NAMING OF THE SPACE LAUNCH SYSTEM.**

14      (a) FINDINGS.—Congress finds that education and  
15      outreach to encourage the next generation of scientists  
16      and engineers to become involved in science and space ex-  
17      ploration is one of the Administration’s most important  
18      missions.

19      (b) REPORT.—Not later than 30 days after the date  
20      of enactment of this Act, the Administration shall submit  
21      to the appropriate committees of Congress a plan to en-  
22      gage the public, including science students in elementary  
23      and secondary education programs, throughout the United  
24      States in naming the Space Launch System.

1 **SEC. 204. REPORT; SPACE SUIT SYSTEM.**

2 Not later than 90 days after the date of enactment  
3 of this Act, the Administration shall submit to the appro-  
4 priate committees of Congress a report updating Congress  
5 on the Constellation Space Suit System. The report shall  
6 include justification as to whether another competition to  
7 award contracts for the design, development, certification,  
8 production, and sustaining engineering of this space suit  
9 system is required to meet the needs of NASA's human  
10 exploration program.

11 **Subtitle B—Maximizing ISS**  
12 **Utilization**

13 **SEC. 221. OPERATION AND UTILIZATION OF THE ISS.**

14 (a) SENSE OF CONGRESS.—It is the sense of Con-  
15 gress that—

16 (1) maximum utilization of partnerships, sci-  
17 entific research, commercial applications, and explo-  
18 ration test bed capabilities of the ISS is essential to  
19 ensuring the greatest return on investments made by  
20 the United States and its international partners in  
21 the development, assembly, and operations of that  
22 unique facility; and

23 (2) every effort should be made to ensure that  
24 decisions regarding the service life of the ISS are  
25 made on the basis of its projected capability to con-

1       tinue providing effective and productive research and  
2       exploration test bed capabilities.

3       (b) CONTINUATION OF THE INTERNATIONAL SPACE  
4 STATION.—Congress reaffirms the policy stated in section  
5 501(a) of the National Aeronautics and Space Administra-  
6 tion Authorization Act of 2010 (42 U.S.C. 18351(a)) that  
7 it shall be the policy of the United States, in consultation  
8 with its international partners in the ISS program, to sup-  
9 port full and complete utilization of the ISS through at  
10 least 2020.

11       (c) NASA ACTIONS.—In furtherance of the policy  
12 under subsection (b), the Administrator shall ensure, to  
13 the extent practicable, that the ISS, as a designated na-  
14 tional laboratory—

15               (1) remains viable as an element of overall ex-  
16 ploration and partnership strategies and approaches;  
17 and

18               (2) remains an effective, functional vehicle pro-  
19 viding research and test bed capabilities for the  
20 United States through 2020, up to 2028, and pos-  
21 sibly beyond.

22       (d) REPORT.—The Administrator, in consultation  
23 with the Office of Science and Technology Policy, shall  
24 determine, through analyses and discussions with ISS  
25 partners, the feasible and preferred service life of the ISS

1 as a unique scientific, commercial, and exploration-related  
2 facility. Not later than 120 days after the date of enact-  
3 ment of this Act, and triennially thereafter, the Adminis-  
4 trator shall submit to the appropriate committees of Con-  
5 gress a report that, at a minimum, includes—

6 (1) an assessment of whether ISS operations  
7 can be extended to at least 2028, including—

8 (A) a description of any activities that  
9 would be required of the international partner-  
10 ship to ensure that safety requirements are  
11 met;

12 (B) a general discussion of international  
13 partner capabilities and interest in extension, to  
14 include the potential for participation by addi-  
15 tional countries;

16 (C) a review of essential systems or equip-  
17 ment upgrades that would be necessary for ISS  
18 extension and utilization to at least 2028;

19 (D) an evaluation of the cost and schedule  
20 requirements associated with the development  
21 and delivery of essential systems or equipment  
22 upgrades identified under subparagraph (C);  
23 and

24 (E) an identification of possible partner  
25 contributions and program transitions to pro-

1           vide the upgrades identified under subpara-  
2           graph (C);

3           (2) an evaluation of the potential for expanding  
4           the use of ISS facilities to accommodate the needs  
5           of researchers and other users, including changes to  
6           policies, regulations, and laws that would stimulate  
7           greater private and public involvement on the ISS;  
8           and

9           (3) such other information as may be necessary  
10          to fully describe the justification for and feasibility  
11          of extending the service life of the ISS, including the  
12          potential scientific or technological benefits to the  
13          Federal Government or public, or to academic or  
14          commercial entities that, within the United States-  
15          owned modules of the ISS or in partner-owned facili-  
16          ties of the ISS allocated for United States utilization  
17          by international agreement, are or may become en-  
18          gaged in research and testing activities sponsored,  
19          conducted, and managed by the Administration or  
20          by the ISS management entity.

21          (e) DEFINITION OF ISS MANAGEMENT ENTITY.—In  
22          this section, the term “ISS management entity” means  
23          the organization with which the Administrator enters into  
24          a cooperative agreement under section 504(a) of the Na-

1 tional Aeronautics and Space Administration Authoriza-  
2 tion Act of 2010 (42 U.S.C. 18354(a)).

3 **SEC. 222. RESEARCH ROLES AND RESPONSIBILITIES.**

4 (a) SENSE OF CONGRESS.—It is the sense of Con-  
5 gress that—

6 (1) expansion of the non-NASA utilization of  
7 the ISS is critical to maximizing the research poten-  
8 tial of the ISS national laboratory and to facilitating  
9 expanded commercial activity in low-Earth orbit;  
10 and

11 (2) in order to expand the non-NASA scientific  
12 utilization of ISS research capabilities and facilities,  
13 it is essential to clarify the roles and responsibilities  
14 of the entities managing research within the U.S.  
15 Segment of the ISS.

16 (b) MANAGEMENT OF THE ISS NATIONAL LABORA-  
17 TORY.—Section 504 of the National Aeronautics and  
18 Space Administration Authorization Act of 2010 (42  
19 U.S.C. 18354) is amended—

20 (1) in subsection (b), by adding at the end the  
21 following:

22 “(3) CONFLICTS OF INTEREST.—The Adminis-  
23 trator shall ensure that the liaison function under  
24 this subsection is implemented in a manner that pre-  
25 cludes any conflict of interest between the objectives

1 and activities of the entities identified under sub-  
2 section (e).”;

3 (2) in subsection (d)(2)—

4 (A) by inserting “(A) IN GENERAL.—” be-  
5 fore “If any NASA research plan” and adjust-  
6 ing the text accordingly;

7 (B) by inserting “and subject to subpara-  
8 graph (B)” after “Until September 30, 2020”  
9 in subparagraph (A), as redesignated; and

10 (C) by adding at the end the following:

11 “(B) MUTUAL AGREEMENT.—An exception  
12 under subparagraph (A) may only be granted if  
13 there is mutual agreement between the entities  
14 identified under subsection (e).”; and

15 (3) by adding at the end the following:

16 “(e) CLARIFICATION OF ROLES.—The organization  
17 with which the Administrator enters into a cooperative  
18 agreement under subsection (a) for management of the  
19 ISS national laboratory shall be considered a separate and  
20 equal partner of any NASA organizational entity respon-  
21 sible for management of the NASA research plan onboard  
22 the ISS.”.

23 (c) REPORT.—

24 (1) IN GENERAL.—Not later than 180 days  
25 after the date of enactment of this Act, the Adminis-

1       trator shall submit to the appropriate committees of  
2       Congress a report on the following:

3               (A) Options for expanding the Administra-  
4               tion's collaboration with its ISS partners, in-  
5               cluding—

6                       (i) providing U.S. personnel expanded  
7                       access to international partner research fa-  
8                       cilities; and

9                       (ii) coordinating research efforts to  
10                      minimize the duplication of effort, unless  
11                      duplication is a justified element of the sci-  
12                      entific process or essential for backup or  
13                      redundant capability.

14              (B) The potential for increasing ISS crew  
15              size to maximize utilization and applications.

16              (C) Efforts undertaken by the Administra-  
17              tion and the ISS management entity—

18                      (i) to enhance collaborative research  
19                      between the Administration and other Fed-  
20                      eral science agencies, such as the National  
21                      Institutes of Health and the National  
22                      Science Foundation; and

23                      (ii) to expand the use of the ISS na-  
24                      tional laboratory capabilities by Federal  
25                      science agencies.



1 terms and conditions under paragraphs (1), (2), (3),  
2 and (5) of section 202(e) of title 35, if the Adminis-  
3 trator finds that the reservation of the license by the  
4 Administrator would substantially inhibit the com-  
5 mercialization of an invention.

6 “(2) CONSTRUCTION.—Nothing in this sub-  
7 section shall be construed to affect the rights of the  
8 Federal Government under any other procurement  
9 contract, grant, understanding, arrangement, agree-  
10 ment, or transaction.”.

11 **SEC. 224. COMMERCIAL CARGO AND CREW CAPABILITIES.**

12 (a) FINDINGS.—Congress finds that—

13 (1) NASA’s Commercial Orbital Transportation  
14 Services, Cargo Resupply Services, and Commercial  
15 Crew Program demonstrate the potential for pro-  
16 curing routine, commercially provided access to the  
17 ISS and to low-Earth orbit using innovative and  
18 cost-effective development and procurement strate-  
19 gies;

20 (2) Federal investments in the U.S. private  
21 space industry have the ability to provide for lower  
22 cost access to space for researchers and for commer-  
23 cial ventures;

24 (3) commercially provided space transportation  
25 is critical to maximizing utilization of the ISS;

1           (4) encouraging competition among launch serv-  
2           ice providers and maintaining multiple space trans-  
3           portation options helps to reduce long-term costs to  
4           the Federal Government and to induce continual im-  
5           provement in available private-sector services; and

6           (5) consistent with section 201(b) of the Na-  
7           tional Aeronautics and Space Administration Au-  
8           thorization Act of 2010 (42 U.S.C. 18311(b)), main-  
9           taining multiple launch service providers helps en-  
10          sure uninterrupted access to the space environment  
11          should a particular provider's services become un-  
12          available.

13          (b) SENSE OF CONGRESS.—It is the sense of Con-  
14          gress that the Administration—

15               (1) should continue to support the development  
16               of safe, reliable, and cost effective commercial  
17               launch capabilities for the primary purpose of secur-  
18               ing domestic access to the ISS as quickly and safely  
19               as possible; and

20               (2) should encourage a viable commercial mar-  
21               ket for the capabilities under paragraph (1).

22          (c) UNITED STATES POLICY.—It is the policy of the  
23          United States that, to foster the competitive development,  
24          operation, and improvement of private space transpor-  
25          tation services, services for Federal Government access to

1 and return from the ISS, whenever feasible, shall be pro-  
2 cured via fair and open competition for well-defined, mile-  
3 stone-based, Federal Acquisition Regulation-based con-  
4 tracts under section 201(a) of the National Aeronautics  
5 and Space Administration Authorization Act of 2010 (42  
6 U.S.C. 18311(a)).

7 (d) SELECTION OF COMMERCIAL PROVIDERS.—In  
8 evaluating commercial space transportation service pro-  
9 viders, the Administrator—

10 (1) shall aim to minimize the life-cycle costs of  
11 obtaining transportation services;

12 (2) shall assure compliance with all safety and  
13 mission assurance requirements;

14 (3) shall consider contractor financial invest-  
15 ment into the development of transportation capa-  
16 bilities; and

17 (4) for commercial crew transport services—

18 (A) shall consider flexibility in design, in-  
19 cluding sample return capabilities; and

20 (B) shall provide a written notification and  
21 justification to the appropriate committees of  
22 Congress if the price per seat exceeds the cost  
23 negotiated by NASA for crew transport in April  
24 2013.

1           (5) STRATEGY FOR PROCURING COMMERCIAL  
2 SERVICES.—In implementing the policy under sub-  
3 section (c), the Administrator shall submit to the ap-  
4 propriate committees of Congress, not later than  
5 120 days after the date of enactment of this Act, a  
6 strategy for transitioning from Space Act Agree-  
7 ments to Federal Acquisition Regulation-based con-  
8 tracts for the procurement of crew transportation  
9 services to and from the ISS. The strategy shall in-  
10 clude—

11                   (A) a comparison of potential procurement  
12 strategies based on—

13                           (i) maximizing safety and mission as-  
14 surance;

15                           (ii) the total projected costs to the  
16 Federal Government through 2020, given  
17 multiple projections of Government de-  
18 mand for launch services;

19                           (iii) the feasibility of the procurement  
20 strategy and timeline, given projected  
21 funding availabilities;

22                           (iv) the potential for supporting the  
23 research and exploration test bed needs of  
24 the Federal Government and of the inde-  
25 pendent entity responsible for ISS national

1 laboratory activities for the purposes de-  
2 scribed under section 504(d) of the Na-  
3 tional Aeronautics and Space Administra-  
4 tion Authorization Act of 2010 (42 U.S.C.  
5 18354(d)); and

6 (v) the projected impacts on devel-  
7 oping a viable market for commercial  
8 launch services;

9 (B) an evaluation of the costs and benefits  
10 of ensuring the availability of at least 2 U.S.-  
11 based launch service providers, considering—

12 (i) the potential need for diversified  
13 cargo and sample return capabilities, in-  
14 cluding a soft-landing capability as de-  
15 scribed under section 404 of the National  
16 Aeronautics and Space Administration Au-  
17 thorization Act of 2010 (124 Stat. 2822);  
18 and

19 (ii) the ability of multiple cargo or  
20 crew launch service providers to meet pri-  
21 vate or non-NASA Government mission re-  
22 quirements and the subsequent benefit to  
23 the United States of such ability;

24 (C) justification for the procurement strat-  
25 egy selected from among those considered; and

1 (D) for the selected procurement strategy,  
2 identification of additional or modified authori-  
3 ties, regulations, or guidelines that are nec-  
4 essary for successful implementation.

## 5 **Subtitle C—Other Matters**

### 6 **SEC. 231. SAFETY AND MISSION ASSURANCE IN HUMAN** 7 **SPACE FLIGHT.**

8 (a) FINDINGS.—Congress makes the following find-  
9 ings:

10 (1) In the early part of the space race, the  
11 United States took over 3 years from the launch of  
12 the first American satellite, Explorer I, to the launch  
13 of the first American to space, Alan B. Shepard, Jr.

14 (2) It was known then, as it is now, that the  
15 exploration of space by humans is an inherently dan-  
16 gerous endeavor.

17 (3) Access to space requires complex propulsion  
18 systems, such as the now retired Space Shuttle,  
19 which generated over 7,000,000 pounds of thrust.

20 (4) Adding humans to the complex systems re-  
21 quired to reach space requires additional safeguards,  
22 life support systems, and other measures to protect  
23 from the harsh environment of space in order to  
24 minimize risk to human life.

1 (b) SENSE OF CONGRESS.—It is the sense of Con-  
2 gress that—

3 (1) meticulousness and attention to detail helps  
4 ensure that all humans are safe and protected to the  
5 best of the abilities of all those involved in helping  
6 achieve the reaches of space;

7 (2) those who strive to send humans into space  
8 should make every effort to ensure the success of  
9 missions and programs through independent safety  
10 and mission assurance analyses;

11 (3) diligent oversight efforts ensure adherence  
12 to safety, reliability, and quality assurance policies  
13 and procedures for missions and programs; and

14 (4) lessons learned from mishaps and near  
15 misses should be implemented into designs, deci-  
16 sions, policy, and procedures to reduce the risk of  
17 future incidents that could jeopardize crew safety or  
18 mission success.

19 **SEC. 232. LAUNCH LIABILITY PROVISIONS.**

20 (a) LIABILITY EXTENSION.—Section 50915(f) of title  
21 51, United States Code, is amended by striking “Decem-  
22 ber 31, 2013” and inserting “December 31, 2016”.

23 (b) PROTECTION FOR LAUNCH ACTIVITIES.—Sub-  
24 chapter III of chapter 201 of title 51, United States Code  
25 is amended by inserting after section 20147 the following:

1 **“§ 20148. Indemnification; NASA launch services**

2       “(a) IN GENERAL.—Under such regulations in con-  
3 formity with this section as the Administrator shall pre-  
4 scribe taking into account the availability, cost, and terms  
5 of liability insurance, any contract between the Adminis-  
6 tration and a provider may provide that the United States  
7 will indemnify a provider against claims (including reason-  
8 able expenses of litigation or settlement) by third parties  
9 for death, bodily injury, or loss of or damage to property  
10 resulting from activities that the contract defines as un-  
11 usually hazardous or nuclear in nature, but—

12               “(1) only to the extent that such claims are not  
13 compensated by liability insurance of the provider;  
14 and

15               “(2) only to the extent that such claims arise  
16 out of the direct performance of the contract.

17       “(b) LIMITATION.—Indemnification under subsection  
18 (a) may be limited to claims resulting from other than the  
19 actual negligence or willful misconduct of the provider.

20       “(c) TERMS OF INDEMNIFICATION.—A contract  
21 made under subsection (a) that provides indemnification  
22 shall also provide for—

23               “(1) notice to the United States of any claim or  
24 suit against the provider for death, bodily injury, or  
25 loss of or damage to property; and

1           “(2) control of or assistance in the defense by  
2           the United States, at its election, of that suit or  
3           claim.

4           “(d) LIABILITY INSURANCE OF THE PROVIDER.—  
5           Each provider that is a party to a contract made under  
6           subsection (a) shall have and maintain liability insurance  
7           in such amounts as the Administrator shall require to  
8           cover liability to third parties and loss of or damage to  
9           property.

10          “(e) NO INDEMNIFICATION WITHOUT CROSS-WAIV-  
11          ER.—Notwithstanding subsection (a), the Administrator  
12          may not indemnify a provider under this section unless  
13          there is a cross-waiver between the Administration and the  
14          provider as described in subsection (f).

15          “(f) CROSS-WAIVERS.—The Administrator, on behalf  
16          of the United States, and its departments, agencies, and  
17          instrumentalities, may reciprocally waive claims with a  
18          provider under which each party to the waiver agrees to  
19          be responsible, and agrees to ensure that its own related  
20          entities are responsible, for damage or loss to its property  
21          for which it is responsible, or for losses resulting from any  
22          injury or death sustained by its own employees or agents,  
23          as a result of activities connected to the contract.

24          “(g) CERTIFICATION OF JUST AND REASONABLE  
25          AMOUNT.—No payment may be made under subsection

1 (a) unless the Administrator or the Administrator’s des-  
2 ignee certifies that the amount is just and reasonable.

3 “(h) PAYMENTS.—Upon the approval by the Admin-  
4 istrator, payments under subsection (a) may be made, at  
5 the Administrator’s election, either from—

6 “(1) funds obligated for the performance of the  
7 agreement concerned;

8 “(2) funds available for research and develop-  
9 ment not otherwise obligated; or

10 “(3) funds appropriated for such payments.

11 “(i) RELATIONSHIP TO OTHER LAWS.—The Admin-  
12 istrator may not provide indemnification under this sec-  
13 tion for an activity that requires a license or permit under  
14 chapter 509.

15 “(j) CONSTRUCTION.—The authority to indemnify  
16 under this section shall not create any rights in third per-  
17 sons that would not otherwise exist by law.

18 “(k) DEFINITIONS.—In this section:

19 “(1) LAUNCH SERVICES.—The term ‘launch  
20 services’ has the meaning given the term in section  
21 50902.

22 “(2) PROVIDER.—The term ‘provider’ means a  
23 person that provides domestic launch services in sup-  
24 port of any space activity the Government carries  
25 out for the Government.”.

1 (c) CONFORMING AMENDMENT.—The table of con-  
 2 tents for subchapter III of chapter 201 of title 51, United  
 3 States Code, is amended by inserting after the item relat-  
 4 ing to section 20147 the following:

“20148. Indemnification; NASA launch services.”.

## 5 **TITLE III—SCIENCE**

### 6 **Subtitle A—Earth Science**

#### 7 **SEC. 301. EARTH SCIENCE.**

8 (a) FINDINGS.—Congress finds that—

9 (1) continuous, long-term Earth observation  
 10 data supports the preparation for and management  
 11 of natural and human-induced disasters, benefits re-  
 12 source management and agricultural forecasting, im-  
 13 proves our understanding of climate, and encourages  
 14 environmental and economic sustainability;

15 (2) due to the scope of activities required,  
 16 Earth science research and Earth observation are  
 17 multi-agency endeavors requiring significant co-  
 18 operation and information sharing among govern-  
 19 ment, international, and scientific community part-  
 20 ners;

21 (3) in developing Earth observation tech-  
 22 nologies, conducting Earth science satellite missions,  
 23 and providing research products to the scientific  
 24 community, NASA plays a crucial role in advancing  
 25 Earth science; and

1           (4) the loss of observational capabilities in  
2 Earth science, as predicted by the National Research  
3 Council's midterm update to its Earth Science  
4 Decadal Survey, risks reversing gains in weather  
5 forecast accuracy, reducing disaster response capa-  
6 bilities, and creating an irreversible gap in Earth  
7 science data.

8           (b) SENSE OF CONGRESS.—It is the sense of Con-  
9 gress that—

10           (1) given the importance of Earth science and  
11 Earth observation data, NASA Earth science ef-  
12 forts—

13                   (A) should be conducted in coordination  
14 with other Federal agencies; and

15                   (B) should be cognizant of international ef-  
16 forts and the needs of the scientific and busi-  
17 nesses communities; and

18           (2) whenever feasible, NASA and other Federal  
19 agencies should consider the potential for reducing  
20 costs by purchasing commercially available Earth  
21 science data and services.

22           (c) MISSION PRIORITIZATION.—

23           (1) NATIONAL STRATEGY FOR EARTH OBSERVA-  
24 TION.—The Office of Science and Technology Policy,  
25 in implementing its National Strategy for Earth Ob-

1        servation and in developing a National Plan for Civil  
2        Earth Observations, shall prioritize Federal Earth  
3        science and observation investments based on—

4                (A) its assessment of Earth science and  
5                observation data requirements;

6                (B) the capability requirements as identi-  
7                fied by the National Academies decadal surveys;

8                (C) the projected costs of Earth science  
9                missions and data gathering activities; and

10               (D) the projected and available budgets.

11               (2) NATIONAL PLAN FOR CIVIL EARTH OBSER-  
12        VATIONS.—The Administration, in prioritizing future  
13        Earth science and Earth observation missions and  
14        technology development under the National Plan for  
15        Civil Earth Observations and chapter 201 of title  
16        51, United States Code, shall consider potential  
17        cost-reduction opportunities, including—

18               (A) if feasible, co-locating Earth science  
19               sensors on other satellites; and

20               (B) purchasing commercially available  
21               Earth science data and services, including  
22               launch access to orbital and sub-orbital space.

1           **Subtitle B—Space Science**

2   **SEC. 321. HUMAN EXPLORATION AND SCIENCE COLLABO-**  
3           **RATION.**

4           The Administrator shall ensure that the Science Mis-  
5 sion Directorate and the Human Exploration and Oper-  
6 ations Mission Directorate coordinate in researching and  
7 reducing the risks that space exploration beyond low-  
8 Earth orbit pose to astronaut health. Not later than 90  
9 days after the date of enactment of this Act, the Adminis-  
10 trator shall provide to the appropriate committees of Con-  
11 gress a report detailing the results of previous research  
12 in this area and identifying opportunities for future  
13 science missions to contribute to the understanding of  
14 these risks.

15   **SEC. 322. MAINTAINING A BALANCED SPACE SCIENCE**  
16           **PORTFOLIO.**

17           (a) IN GENERAL.—Section 803 of the National Aero-  
18 nautics and Space Administration Authorization Act of  
19 2010 (124 Stat. 2832) is amended to read as follows:

20   **“SEC. 803. OVERALL SCIENCE PORTFOLIO; SENSE OF CON-**  
21           **GRESS.**

22           “Congress reaffirms its sense that a balanced and  
23 adequately funded set of activities, consisting of research  
24 and analysis grants programs, technology development,  
25 small, medium, and large space missions, and suborbital

1 research activities, contributes to a robust and productive  
2 science program and serves as a catalysis for innovation  
3 and discovery. The Administrator should set science prior-  
4 ities by following the guidance provided by the scientific  
5 community through the National Academies' decadal sur-  
6 veys.”.

7 (b) CONFORMING AMENDMENT.—The item relating  
8 to section 803 in the table of contents in section 1(b) of  
9 the National Aeronautics and Space Administration Au-  
10 thorization Act of 2010 (124 Stat. 2806) is amended by  
11 striking “Overall science portfolio-sense of the Congress”  
12 and inserting “Overall science portfolio; sense of Con-  
13 gress”.

14 **SEC. 323. SCIENCE MISSION EXTENSIONS.**

15 Section 30504 of title 51, United States Code is  
16 amended to read as follows:

17 **“§ 30504. Assessment of science mission extensions**

18 “(a) ASSESSMENT.—The Administrator shall carry  
19 out biennial reviews within each of the Science divisions  
20 to assess the cost and benefits of extending the date of  
21 the termination of data collection for those missions that  
22 have exceeded their planned mission lifetime. In con-  
23 ducting these assessments, the Administrator shall con-  
24 sider—

1           “(1) the potential continued benefit of instru-  
2           ments on missions that are beyond their planned  
3           mission lifetime; and

4           “(2) the cost and schedule impacts, if any, of  
5           mission extension on other NASA activities and  
6           science missions.

7           “(b) CONSULTATION REQUIREMENT.—When decid-  
8           ing whether to extend science missions with an operational  
9           component, the Administrator shall consult with the Na-  
10          tional Oceanic and Atmospheric Administration and any  
11          other affected Federal agency.”.

12   **SEC. 324. PLANETARY SCIENCE.**

13          (a) FINDINGS.—Congress finds that—

14               (1) Administration support for planetary  
15               science is critical to enabling greater understanding  
16               of the solar system and its origin;

17               (2) the United States leads the world in plan-  
18               etary science and can augment its success with ap-  
19               propriate international partnerships;

20               (3) a mix of small-, medium-, and large-plan-  
21               etary science missions is required to sustain a steady  
22               cadence of planetary exploration; and

23               (4) robotic planetary exploration is a key com-  
24               ponent of preparing for future human exploration.

1 (b) MISSION PRIORITIES.—In accordance with the  
2 priorities established in the most recent decadal survey for  
3 planetary science, the Administrator shall ensure, to the  
4 greatest extent practicable, the completion of a balanced  
5 set of Discovery, New Frontiers, and flagship missions.  
6 The Administrator may seek, if necessary, adjustments to  
7 mission priorities, schedule, and scope in light of changing  
8 budget projections.

9 (c) INSTRUMENTATION.—To support its science mis-  
10 sion priorities, the Administration shall invest in a sus-  
11 tained program to develop or mature scientific instrument  
12 capabilities, as delineated in the NASA Science Instru-  
13 ments, Observatories, and Sensor Systems Roadmap.

14 **SEC. 325. SPACE WEATHER.**

15 (a) OSTP ROADMAP.—In coordination with NASA,  
16 the National Oceanic and Atmospheric Administration,  
17 and other relevant Federal agencies, the Director of the  
18 Office of Science and Technology Policy, not later than  
19 24 months after the date of enactment of this Act, shall  
20 deliver to the appropriate committees of Congress a road-  
21 map for developing and deploying space weather fore-  
22 casting technologies. The roadmap shall, at a minimum—  
23 (1) aim to relieve capability gaps identified by  
24 the National Space Weather Program Council review  
25 of space weather observing systems, as requested by

1 the National Aeronautics and Space Administration  
2 Authorization Act of 2010 (42 U.S.C. 18301 et  
3 seq.); and

4 (2) consider ongoing and future requirements  
5 for space weather modeling, monitoring, and pre-  
6 diction.

7 (b) NASA TECHNOLOGY ROADMAPS.—The Adminis-  
8 tration shall update and further develop its technology  
9 roadmaps as required to address mitigating a wide range  
10 of space weather effects on both satellites and spacecraft.

11 (c) ALERT PROTOCOL.—The Director of the Office  
12 of Science and Technology Policy shall coordinate relevant  
13 Federal agencies to propose protocols for communicating  
14 and responding to space weather forecasts. Protocol as-  
15 sessment shall consider the needs of both government and  
16 private sector entities. The Director of the Office of  
17 Science and Technology Policy shall deliver a report on  
18 proposed protocols to Congress not later than 24 months  
19 after the date of enactment of this Act.

20 **SEC. 326. JAMES WEBB SPACE TELESCOPE.**

21 It is the sense of Congress that—

22 (1) the James Webb Space Telescope will sig-  
23 nificantly advance our understanding of star and  
24 planet formation, improve our knowledge of the early

1 universe, and support U.S. leadership in astro-  
2 physics;

3 (2) significant progress has been made with re-  
4 gard to overcoming the James Webb Space Tele-  
5 scope's technical challenges and in improving NASA  
6 management oversight;

7 (3) the on-time and on-budget completion of the  
8 James Webb Space Telescope should remain a top  
9 NASA priority; and

10 (4) consistent with annual Government Ac-  
11 countability Office reviews of the James Webb Space  
12 Telescope program, the Administrator should con-  
13 tinue to improve the James Webb Space Telescope's  
14 cost and schedule estimates and oversight proce-  
15 dures in order to enhance NASA's ability to success-  
16 fully deliver the James Webb Space Telescope on  
17 time and on budget.

18 **SEC. 327. UNIVERSITY CLASS SCIENCE MISSIONS.**

19 (a) SENSE OF CONGRESS.—It is the sense of Con-  
20 gress that principal investigator-led small orbital science  
21 missions, including CubeSat, University Explorer  
22 (UNEX), Small Explorer (SMEX), and Venture class mis-  
23 sions, offer valuable, lower-cost opportunities to advance  
24 science, train the next generation of scientists and engi-  
25 neers, and provide opportunities for program participants

1 to acquire skills in systems engineering and systems inte-  
2 gration that are critical to maintaining the Nation's lead-  
3 ership in space.

4 (b) REVIEW OF PRINCIPAL INVESTIGATOR LED  
5 SMALL ORBITAL SCIENCE MISSIONS.—

6 (1) IN GENERAL.—Not later than 120 days  
7 after the date of enactment of this Act, the Adminis-  
8 trator shall enter into an arrangement with the Na-  
9 tional Academy of Sciences to conduct a review of  
10 the small orbital science missions described under  
11 subsection (a).

12 (2) REQUIREMENTS.—The review under para-  
13 graph (1) shall include the following:

14 (A) The status, capability, and availability  
15 of existing small orbital science mission pro-  
16 grams in which the missions are led by prin-  
17 cipal investigators and enable significant par-  
18 ticipation by university scientists and students.

19 (B) The opportunities that the small or-  
20 bital science missions described under sub-  
21 section (a) provide for scientific research, train-  
22 ing, and education, including scientific and en-  
23 gineering workforce development.

24 (C) The use of commercial applications,  
25 such as hosted payloads, free flyers, and data

1           buys, as vehicles to further the goals of small  
2           orbital science missions, while preserving the  
3           principle of independent peer review as the  
4           basis for mission selection.

5           (c) REPORT.—

6           (1) IN GENERAL.—Not later than 15 months  
7           after the date of enactment of this Act, the Adminis-  
8           trator shall submit to the appropriate committees of  
9           Congress a report on the review required by this sec-  
10          tion.

11          (2) CONTENTS.—The report shall include—

12           (A) a summary of the review under sub-  
13           section (b);

14           (B) the findings of the Administrator with  
15           respect to that review; and

16           (C) recommendations regarding principal  
17           investigator led small orbital science missions  
18           conducted by the Administration.

## 19           **TITLE IV—AERONAUTICS**

### 20           **SEC. 401. SENSE OF CONGRESS ON NASA AERONAUTICS.**

21           (a) FINDINGS.—Congress finds that—

22           (1) aviation is vital to the United States econ-  
23           omy, with the industry supporting nearly 1,000,000  
24           jobs, conducting nearly 10,000,000 commercial  
25           flights per year within the United States alone, and

1 contributing to the aerospace industry's positive  
2 trade balance in 2012;

3 (2) in helping test and mature new technologies  
4 for quiet and efficient air transportation, NASA's  
5 Aeronautics Research Mission Directorate addresses  
6 major aviation trends, such as the rapid growth in  
7 passengers, increasing fuel costs, and the demand  
8 for faster vehicles;

9 (3) the Directorate works closely with industry  
10 and academia to address long-term challenges to the  
11 air transportation system that require improving  
12 aviation safety, increasing the capacity of the in-  
13 creasingly crowded national airspace system, and re-  
14 ducing environmental impacts;

15 (4) through its Aeronautics Test Program, the  
16 Directorate manages the flight operations and test  
17 infrastructure at 4 NASA centers, providing both  
18 NASA and its industry partners with access to crit-  
19 ical facilities;

20 (5) NASA's contribution to aeronautics is evi-  
21 denced in the use of its technologies in almost every  
22 modern aircraft; and

23 (6) the Directorate has identified otherwise un-  
24 known safety issues and helped optimize aircraft

1 routes, yielding millions of dollars in potential sav-  
2 ings to airlines and benefitting passengers.

3 (b) SENSE OF CONGRESS.—It is the sense of Con-  
4 gress that—

5 (1) the Aeronautics Research Mission Direc-  
6 torate builds on the successful legacy of NASA’s  
7 predecessor, the National Advisory Committee for  
8 Aeronautics, which worked closely with industry  
9 partners to advance both military and civil aviation  
10 until its dissolution in 1958;

11 (2) NASA aeronautics research, development,  
12 and test activities, including investments into com-  
13 posite structures, new fuels, and innovative aircraft  
14 concepts, must continue in order to support U.S.  
15 leadership in aviation;

16 (3) the Directorate’s efforts to collaborate with  
17 the aviation industry to gather and analyze data and  
18 to prototype and test algorithms that optimize flight  
19 routes, manage air traffic, and account for weather  
20 impacts are critical to supporting the safe use of the  
21 national airspace; and

22 (4) continued cooperation between NASA’s Aer-  
23 onautics Research Mission Directorate and the Fed-  
24 eral Aviation Administration is vital to providing the  
25 data and tools necessary to best regulate the na-

1 tional airspace and to ensure that new technologies  
2 are effectively tested and acquire timely regulatory  
3 approval.

## 4 **TITLE V—SPACE TECHNOLOGY**

### 5 **SEC. 501. SPACE TECHNOLOGY.**

6 (a) SENSE OF CONGRESS.—It is the sense of the Con-  
7 gress that—

8 (1) previous investments in space technologies  
9 have not only enabled space exploration and research  
10 missions, but also have improved the quality of life  
11 on Earth;

12 (2) by improving affordability, reliability, and  
13 operational capability, continued space technology  
14 developments will enable NASA missions that other-  
15 wise would be unachievable;

16 (3) investments in space technology engage the  
17 talent of the Administration and of the Nation’s aca-  
18 demic and business enterprises; and

19 (4) space technology roadmaps serve as a useful  
20 framework for NASA, academic, and industry devel-  
21 opment efforts.

22 (b) SPACE TECHNOLOGY DIRECTIVE.—To advance  
23 NASA’s space exploration and space research goals, the  
24 Administrator shall continue a program with responsibility  
25 for NASA investments in space technologies and capabili-

1 ties. To the greatest extent possible, the Administrator  
2 shall synergize all NASA space technology investments,  
3 encourage collaboration in space technology development  
4 with academia and industry, and minimize duplication of  
5 space technology development efforts across the Adminis-  
6 tration and the private sector unless duplication is re-  
7 quired to maintain mission safety, security, or backup ca-  
8 pability.

9 (c) SPACE TECHNOLOGY ROADMAP REPORT.—In  
10 carrying out the policy under subsection (b), the Adminis-  
11 trator shall submit to the appropriate committees of Con-  
12 gress, not later than 24 months after the date of enact-  
13 ment of this Act, a progress report on the development,  
14 testing, and demonstration of the 14 technological areas  
15 of the Space Technology Roadmaps.

## 16 **TITLE VI—EDUCATION**

### 17 **SEC. 601. EDUCATION AND OUTREACH ACTIVITIES.**

18 (a) SENSE OF CONGRESS.—It is the sense of Con-  
19 gress that—

20 (1) the Administration is uniquely recognized in  
21 the educational and global communities for its aero-  
22 space knowledge, passionate workforce, and unique  
23 capabilities and facilities;

24 (2) U.S. competitiveness in aerospace requires  
25 engaging the science, technology, engineering, and

1 mathematics (STEM) talent in all States and juris-  
2 dictions;

3 (3) the Administration's education and outreach  
4 programs, including the Experimental Program to  
5 Stimulate Competitive Research (EPSCoR) and the  
6 Space Grant College and Fellowship Program, re-  
7 flect the Administration's successful commitment to  
8 growing and diversifying the national science and  
9 engineering workforce;

10 (4) the Administration's outreach efforts to  
11 underrepresented and underserved communities, by  
12 helping minorities to pursue higher education in  
13 STEM fields and to attain STEM careers, benefit  
14 the overall national workforce; and

15 (5) the Administration's efforts to improve the  
16 management and execution of its education portfolio  
17 and to evaluate program success using evidence-  
18 based approaches should continue.

19 (b) IN GENERAL.—The Administration shall—

20 (1) continue to execute its educational and out-  
21 reach programs, including providing a wide range of  
22 academic research opportunities and engaging the  
23 public interest in science, technology, engineering  
24 and mathematics;



1           (2) Cross Agency Support provides for the  
2 unique facilities, skilled personnel, and administra-  
3 tive support that NASA programs, research, and de-  
4 velopment activities require at the centers.

5           (3) Cross Agency Support provides the Admin-  
6 istration with the capability to improve mission suc-  
7 cess by supplying safety and mission assurance, en-  
8 gineering technical authority, and health and med-  
9 ical oversight across all of NASA's programs, re-  
10 search, and operations.

11           (4) The Orbital Debris Program Office is lo-  
12 cated in Cross Agency Support and leads the Ad-  
13 ministration's effort in addressing the orbital debris  
14 issue, which is an issue resulting from over 50 years  
15 of spaceflight.

16           (5) Cross Agency Support delivers the informa-  
17 tion technology services used throughout the Admin-  
18 istration that allow its workforce to work and com-  
19 municate efficiently and effectively, not only internal  
20 to the Administration, but with the citizens of the  
21 world which provides them the opportunity to be in-  
22 cluded and participate in the Administration's ac-  
23 complishments.

24           (6) The Administration's public affairs, located  
25 in Cross Agency Support, provided worldwide live

1 coverage of the Curiosity Rover’s landing on Mars,  
2 the largest rover ever sent to Mars, in August of  
3 2012.

4 (7) The authority and execution of the Admin-  
5 istration’s offices responsible for finance, budget, ac-  
6 quisition, external relations, legislative affairs, train-  
7 ing, security, and human capital management are  
8 performed under Cross Agency Support.

9 (b) SENSE OF CONGRESS.—It is the sense of Con-  
10 gress that—

11 (1) Cross Agency Support represents a variety  
12 of functions vital to the strength and success of the  
13 Administration and is essential to the Administra-  
14 tion’s vision;

15 (2) the centers and facilities in the Administra-  
16 tion are a vital part of the many advances in science  
17 and technology the Administration has provided and  
18 continues to provide to this Nation and the world  
19 since the Administration was created in 1958;

20 (3) at the Administration’s core is safety and  
21 mission success that, through Cross Agency Support,  
22 is carried out by the highly talented and dedicated  
23 workforce at the Administration’s centers and facili-  
24 ties;

1           (4) as the Administration looks to continue  
2 international, interagency, and industry cooperation  
3 and partnerships, Cross Agency Support will con-  
4 tinue to provide the overseeing and execution of  
5 these efforts; and

6           (5) Cross Agency Support be given the nec-  
7 essary resources to keep the Administration capable  
8 of meeting the goals set forth by Congress and con-  
9 tinue to be a global leader in space and aeronautics.

10 **SEC. 702. SPACE COMMUNICATIONS NETWORK.**

11       (a) PLAN.—The Administrator shall prepare an up-  
12 dated plan for NASA’s near-Earth, space, and deep space  
13 communications network and infrastructure. The plan  
14 shall—

15           (1) identify steps to sustain the existing net-  
16 work and infrastructure;

17           (2) assess the capabilities, including any up-  
18 grades, needed to support NASA’s programs;

19           (3) identify priorities for how resources should  
20 be used to implement the plan; and

21           (4) assess the impact on missions if resources  
22 are not secured at the level needed.

23       (b) TRANSMITTAL.—Not later than 270 days after  
24 the date of enactment of this Act, the Administrator shall

1 transmit the plan to the appropriate committees of Con-  
2 gress.

3 **SEC. 703. ASTRONAUT OCCUPATIONAL HEALTHCARE.**

4 (a) IN GENERAL.—Chapter 313 of title 51, United  
5 States Code, is amended by adding at the end the fol-  
6 lowing:

7 **“§ 31303. Astronaut occupational healthcare**

8 “(a) IN GENERAL.—Notwithstanding any other pro-  
9 vision of law, the Administrator, as the Administrator con-  
10 sideres necessary, may provide for the medical monitoring,  
11 diagnosis, and treatment of a crewmember for conditions  
12 that the Administrator considers associated with human  
13 space flight, including scientific and medical tests for psy-  
14 chological and medical conditions.

15 “(b) RECORDS.—Consistent with applicable Federal  
16 privacy laws, the Administration shall retain access to all  
17 medical records and other health data from the provision  
18 of healthcare under subsection (a).

19 “(c) DEFINITION OF CREWMEMBER.—In this section,  
20 the term ‘crewmember’ means—

21 “(1) a former NASA astronaut/payload spe-  
22 cialist who has flown on at least 1 space mission;

23 “(2) a management NASA astronaut who has  
24 flown at least 1 space mission and is currently em-  
25 ployed by the U.S. Government; or

1           “(3) an active NASA astronaut/payload spe-  
2           cialist assigned, waiting assignment, or training for  
3           an assignment to a NASA human space flight.”.

4           (b) CONFORMING AMENDMENT.—The table of con-  
5           tents for chapter 313 of title 51, United States Code, is  
6           amended by adding after the item relating to section  
7           31302 the following:

          “31303. Astronaut occupational healthcare.”.

8           **SEC. 704. HELIUM CAPTURE AND RECOVERY.**

9           (a) IN GENERAL.—Not later than 180 days after the  
10          date of enactment of this Act, the Administrator shall sub-  
11          mit to the appropriate committees of Congress an agency-  
12          wide plan to recover and recycle helium, whenever possible,  
13          that the Administration uses or will use in current,  
14          planned, and future experimentation, tests, launches, and  
15          operations.

16          (b) CONSIDERATIONS.—In developing the plan under  
17          subsection (a), the Administrator shall consider how modi-  
18          fications, updates, or new lifecycle designs for engines, bal-  
19          loons, airships, or other future programs can be designed  
20          or operated to recover and recycle helium.

21          **SEC. 705. INFORMATION TECHNOLOGY GOVERNANCE.**

22          (a) SENSE OF CONGRESS.—It is the sense of Con-  
23          gress that effective information technology governance is  
24          critical to ensuring information security, decreased costs,  
25          and overall mission assurance. The June 5, 2013, NASA

1 Office of Inspector General audit, “NASA’s Information  
2 Technology Governance,” found that the NASA Chief In-  
3 formation Officer has limited oversight and control over  
4 a majority of the Administration’s information technology  
5 assets and cannot enforce security measures across the  
6 agency’s computer networks. For nearly 2 decades, the  
7 Administration has operated under a decentralized infor-  
8 mation technology governance structure that has resulted  
9 in increased costs and inadequate security. At the same  
10 time, centralization of information technology governance  
11 has resulted in increased security and lower operating  
12 costs at other agencies.

13 (b) INFORMATION TECHNOLOGY GOVERNANCE.—  
14 The Administrator shall, in consultation with Mission Di-  
15 rectorate and NASA Center Chief Information Officers—

16 (1) ensure the Agency Chief Information Offi-  
17 cer has the appropriate resources and visibility to  
18 oversee agency-wide information technology oper-  
19 ations and investments;

20 (2) establish a direct line of report between the  
21 Agency Chief Information Officer and the Adminis-  
22 trator;

23 (3) establish a minimum monetary threshold for  
24 all agency information technology investments over

1 which the Agency Chief Information Officer shall  
2 have final approval; and

3 (4) consider appropriate revisions to the char-  
4 ters of information technology boards and councils  
5 that inform information technology investment and  
6 operation decisions.

7 **SEC. 706. IMPROVEMENTS TO BASELINES AND COST CON-**  
8 **TROLS BREACH REPORTING PROCESS.**

9 Section 30104 of title 51, United States Code is  
10 amended—

11 (1) in subsection (d)(3)—

12 (A) by striking “the notification”; and

13 (B) by inserting “the notification and a  
14 timeline by which the Administrator intends to  
15 make the determination, report, and analysis  
16 under subsection (e)” before the period at the  
17 end;

18 (2) in subsection (e)(1), by striking “Not later  
19 than 30 days after receiving a written notification  
20 under subsection (d)(2)” and inserting “In accord-  
21 ance with the timeline under subsection (d)(3)”;

22 (3) in subsection (e)(1)(A), by striking “not  
23 later than 15 days after making the determination”  
24 and inserting “in accordance with the timeline under  
25 subsection (d)(3)”;

1           (4) in subsection (e)(2), by striking “not later  
2 than 6 months after the Administrator makes a de-  
3 termination under this subsection” and inserting “in  
4 accordance with the timeline under subsection  
5 (d)(3)”; and

6           (5) in subsection (f), by inserting “or an annual  
7 budget request that reflects this growth” after “a  
8 report under subsection (e)(1)(A)”.

9 **SEC. 707. INFRASTRUCTURE.**

10       (a) SENSE OF CONGRESS.—It is the sense of Con-  
11 gress that—

12           (1) the Administration has a role in providing  
13 access to unique or specialized laboratory capabilities  
14 that are not economically viable for purchase by  
15 commercial entities and therefore are not available  
16 outside of NASA;

17           (2) the deteriorating condition of the Adminis-  
18 tration’s facilities and other infrastructure is ham-  
19 pering the research effectiveness and efficiency per-  
20 formed at those facilities by both the Administration  
21 and industry participants;

22           (3) the Administration must improve the condi-  
23 tion of its facilities and infrastructure to maintain  
24 the competitiveness of the U.S. aerospace industry;

1           (4) to ensure continued researcher access to re-  
2           liable and efficient world-class facilities, the Admin-  
3           istration should seek to establish strategic partner-  
4           ships with other Federal agencies, academic institu-  
5           tions, and industry, as appropriate; and

6           (5) decisions regarding whether to dispose of,  
7           maintain, or modernize existing facilities and other  
8           infrastructure must be made in the context of meet-  
9           ing the future laboratory needs of the Administra-  
10          tion and other Federal agencies.

11          (b) PLAN.—Not later than 1 year after the date of  
12          enactment of this Act, the Administrator shall submit to  
13          the appropriate committees of Congress a plan for retain-  
14          ing or acquiring the facilities, laboratories, equipment, test  
15          capabilities, and other infrastructure necessary to meet  
16          the Administration’s mandates and its current and future  
17          missions. The plan shall—

18               (1) identify the Administration’s future infra-  
19               structure needs, including facilities, laboratories,  
20               equipment, and test capabilities;

21               (2) include a strategy for identifying and re-  
22               moving unnecessary or duplicative infrastructure  
23               consistent with the national strategic direction under  
24               the National Space Policy, the National Aeronautics  
25               Research, Development, Test and Evaluation Infra-

1 structure Plan, the National Aeronautics and Space  
2 Administration Authorization Act of 2010, title 51  
3 of the United States Code, and other Administra-  
4 tion-related law;

5 (3) include a strategy for the maintenance, re-  
6 pair, upgrading, and modernization of the Adminis-  
7 tration’s facilities, laboratories, equipment, and  
8 other infrastructure;

9 (4) recommend criteria for prioritizing deferred  
10 maintenance tasks and for upgrading or modernizing  
11 facilities, laboratories, equipment, and other infra-  
12 structure;

13 (5) include an assessment of modifications  
14 needed to maximize the use of facilities, laboratories,  
15 equipment, and other infrastructure that offer  
16 unique and highly specialized benefits to the aero-  
17 space industry and the public; and

18 (6) include recommendations for implementa-  
19 tion, including a timeline, milestones, and an esti-  
20 mate of the resources required for carrying out the  
21 plan.

22 (c) ESTABLISHMENT OF CAPITAL FUNDS.—The Ad-  
23 ministrator shall establish a capital fund at each of  
24 NASA’s field centers for the modernization of facilities,  
25 laboratories, equipment, and other infrastructure in ac-

1 cordance with the plan under subsection (b). The Adminis-  
2 trator shall ensure, to the greatest extent practicable, that  
3 any financial savings achieved by closing an outdated or  
4 surplus facility at a NASA field center is made available  
5 to that field center's capital fund for the purpose of mod-  
6 ernizing that field center's facilities, laboratories, equip-  
7 ment, and other infrastructure in accordance with the plan  
8 under subsection (b).

9 **SEC. 708. KNOWLEDGE MANAGEMENT.**

10 (a) SENSE OF CONGRESS.—It is the sense of the Con-  
11 gress that—

12 (1) the Administration's success relies heavily  
13 on the accumulated technical knowledge of its skilled  
14 civil servant and contractor workforce;

15 (2) in light of an aging workforce, it is impera-  
16 tive that the Administration preserve, to the max-  
17 imum extent possible, both critical technical skills  
18 and all knowledge valuable to future mission plan-  
19 ning and operation; and

20 (3) exercising best practice knowledge manage-  
21 ment systems within the Administration will benefit  
22 the future NASA workforce and help ensure future  
23 mission successes.

24 (b) KNOWLEDGE MANAGEMENT SYSTEM.—The Ad-  
25 ministrator shall establish an Administration-wide knowl-

1 edge management system and implement industry-stand-  
2 ard best practices for capturing, archiving, and retrieving  
3 heritage and future information. The information under  
4 this subsection shall be accessible to all Administration  
5 employees unless otherwise prohibited because of the clas-  
6 sified or sensitive nature of the information.

7 (c) REPORT.—Not later than 12 months after the  
8 date of enactment of this Act, the Administrator shall sub-  
9 mit to the appropriate committees of Congress a report  
10 that, at a minimum, includes—

11 (1) a description of any actions necessary to  
12 create or modify an Administration-wide knowledge  
13 management system;

14 (2) a plan for implementing the knowledge  
15 management system, including employee training  
16 and the provision of secure access to information, as  
17 required for all personnel working on Administration  
18 programs, projects, and research;

19 (3) a summary of implementation costs for the  
20 knowledge management system; and

21 (4) a timeline and progress report for imple-  
22 mentation.

23 (d) WORKFORCE STABILIZATION AND CRITICAL  
24 SKILLS PRESERVATION.—Section 1105 of the National  
25 Aeronautics and Space Administration Authorization Act

1 of 2010 (42 U.S.C. 18431) is amended by striking “2013”  
2 and inserting “2016”.

○