7/18

115TH CONGRESS
2D SESSION

S. _____

To authorize the programs of the National Aeronautics and Space Administration, and for other purposes.

IN THE SENATE OF THE UNITED STATES

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Mr. CRUZ (for himself, Mr. NELSON, ~~and~~ + Mr. Rubio + Mr. Cornyn Mr. MARKEY) introduced the following bill; which was read twice and referred to the Committee on

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A BILL

To authorize the programs of the National Aeronautics and Space Administration, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "National Aeronautics and Space Administration Authorization Act of 2018".

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

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATION.—The term "Administration" means the National Aeronautics and Space Administration.

(2) ADMINISTRATOR.—The term "Administrator" means the Administrator of the National Aeronautics and Space Administration.

(3) APPROPRIATE COMMITTEES OF CONGRESS.—Except as otherwise expressly provided, the term "appropriate committees of Congress" means—

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

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

(4) CIS-LUNAR SPACE.—The term "cis-lunar space" means the region of space beyond low-Earth orbit out to and including the region around the surface of the Moon.

(5) DEEP SPACE.—The term "deep space" means the region of space beyond low-Earth orbit, to include cis-lunar space.

(6) ISS.—The term "ISS" means the International Space Station.

(7) ISS MANAGEMENT ENTITY.—The term "ISS management entity" means the organization with which the Administrator has a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

(8) NASA.—The term "NASA" means the National Aeronautics and Space Administration.

(9) OSTP.—The term "OSTP" means the Office of Science and Technology Policy.

TITLE I—AUTHORIZATION OF APPROPRIATIONS

SEC. 101. FISCAL YEAR 2019.

There are authorized to be appropriated to NASA for fiscal year 2019, $21,545,740,000, as follows:

(1) For Exploration, $5,338,700,000.

(2) For Space Operations, $4,639,100,000.

(3) For Science, $6,400,300,000.

(4) For Aeronautics, $725,000,000.

(5) For Space Technology, $1,002,700,000.

(6) For Education, $100,000,000.

(7) For Safety, Security, and Mission Services, $2,850,000,000.

(8) For Construction and Environmental Compliance and Restoration, $450,640,000.

(9) For Inspector General, $39,300,000.

TITLE II—HUMAN SPACE FLIGHT AND EXPLORATION

SEC. 201. VALUE OF ISS AND CAPABILITIES IN LOW-EARTH ORBIT.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) it is in the national and economic security interests of the United States to maintain a continuous human presence in low-Earth orbit; and

(2) low-Earth orbit should be utilized as a testbed to advance human space exploration and scientific discoveries.

(b) HUMAN PRESENCE REQUIREMENT.—NASA shall continuously maintain the capability for a continuous human presence in low-Earth orbit through and beyond the useful life of the ISS.

SEC. 202. CONTINUATION OF THE ISS.

(a) CONTINUATION OF THE ISS.—Section 501(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18351(a)) is amended by striking "2024" and inserting "2030".

(b) MAINTENANCE OF THE UNITED STATES SEGMENT AND ASSURANCE OF CONTINUED OPERATIONS OF THE ISS.—Section 503(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18353(a)) is amended by striking "2024" and inserting "2030".

(c) RESEARCH CAPACITY ALLOCATION AND INTEGRATION OF RESEARCH PAYLOADS.—Section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)) is amended—

(1) in paragraph (1)—

(A) by striking "As soon as practicable after the date of the enactment of this Act, but not later than October 1, 2011," and inserting "The"; and

(B) by striking "2024" and inserting "2030"; and

(2) in paragraph (2), by striking "2024" and inserting "2030".

(d) MAINTAINING USE THROUGH AT LEAST 2030.—Section 70907 of title 51, United States Code, is amended—

(1) in the heading, by striking "**2024**" and inserting "**2030**"; and

(2) in subsections (a) and (b)(3), by striking "2024" and inserting "2030".

(c) ISS TRANSITION PLAN.—Section 50111(c)(2) of title 51, United States Code—

(1) in the matter preceding subparagraph (A), by striking "2023" and inserting "2028"; and

(2) in subparagraph (J), by striking "2028" and inserting "2030".

SEC. 203. REVIEW OF AND REPORT ON DOD ACTIVITIES ON THE ISS.

(a) IN GENERAL.—Not later than March 1, 2019, the Secretary of Defense shall—

(1) identify and review each activity, program, and project of the Department of Defense completed, being carried out, or planned to be carried out on the ISS as of the date of the review; and

(2) submit to the appropriate committees of Congress a report that describes the results of the review under paragraph (1).

(b) APPROPRIATE COMMITTEES OF CONGRESS DEFINED.—In this section, the term "appropriate committees of Congress" includes—

(1) the Committee on Armed Services of the Senate;

(2) the Committee on Armed Services of the House of Representatives; and

(3) the Committee on Energy and Commerce of the House of Representatives.

SEC. 204. LOW-EARTH ORBIT COMMERCIALIZATION.

(a) POLICY.—It is the policy of the United States to encourage the development of a healthy and robust United States commercial sector in low-Earth orbit.

(b) PREFERENCE FOR UNITED STATES COMMERCIAL PRODUCTS AND SERVICES.—The Administrator shall continue to increase the usage of assets, products, and services of the private sector of the United States to fulfill the requirements of the Administration.

(c) NONCOMPETITION.—The Administrator may not offer a space flight product or service related to the ISS to a foreign person or foreign government, except a signatory government to the Intergovernmental Agreement Concerning Cooperation on the Civil International Space Station, signed at Washington January 29, 1998 (TIAS 12927), if the space flight product or service, as applicable, would compete with a commercial space flight product or service offered by the private sector of the United States.

SEC. 205. LOW-EARTH ORBIT COMMERCIALIZATION PROGRAM.

(a) PROGRAM AUTHORIZATION.—The Administrator may establish a low-Earth orbit commercialization program to encourage the fullest commercial use and development of space by the private sector of the United States.

(b) CONTENTS.—The program under subsection (a) may include—

(1) activities to stimulate demand for human space flight products and services in low-Earth orbit;

(2) activities to improve the capability of the ISS to accommodate commercial users; and

(3) subject to subsection (c), activities to accelerate the development of commercial space stations or commercial space habitats.

(c) CONDITIONS.—

(1) COST SHARE.—The Administration shall give priority to each activity under subsection (b)(3) in which the private sector entity conducting the activity provides a share of the costs to develop and operate the activity.

(2) COMMERCIAL SPACE HABITAT.—The Administration may not engage in an activity under subsection (b)(3) until after the date that the Administrator awards a contract for the use of a docking port on the ISS.

(d) REPORTS.—Not later than 30 days after the date that an award or agreement is made under subsection (b)(3), the Administrator shall submit to the appropriate committees of Congress a report on the development of the commercial space station or commercial space habitat, as applicable, including a business plan for how the activity will—

(1) meet NASA's future requirements for low-Earth orbit human space flight services; and

(2) satisfy the non-Federal funding requirement under subsection (c)(1).

SEC. 206. STEPPING STONE APPROACH TO EXPLORATION.

(a) IN GENERAL.—Section 70504 of title 51, United States Code, is amended to read as follows:

"§ 70504. Stepping stone approach to exploration

"(a) IN GENERAL.—The Administrator may conduct missions to intermediate destinations in sustainable steps in accordance with section 20302(b) of this title, and on a timetable determined by the availability of funding, in order to achieve the objective of human exploration of Mars specified in section 202(b)(5) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(b)(5)), if the Administrator—

"(1) determines that each such mission demonstrates or advances a technology or operational

concept that will enable human missions to Mars; and

"(2) incorporates each such mission into the human exploration roadmap under section 432 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115–10; 131 Stat. 18).

"(b) CIS-LUNAR SPACE EXPLORATION ACTIVITIES.—In conducting a mission under subsection (a), the Administrator—

"(1) shall utilize a mix of launches of the Space Launch System and space transportation services from United States commercial providers, as appropriate for the mission;

"(2) beginning after the first successful crewed launch of Orion on the Space Launch System, shall plan for not less than 1 Space Launch System launch annually; and

"(3) may establish an outpost in orbit around the Moon that—

"(A) demonstrates technologies, systems, and operational concepts directly applicable to the space vehicle that will be used to transport humans to Mars;

"(B) has the capability for periodic human habitation; and

"(C) can function as a point of departure, return, or staging for NASA, commercial, or international partner missions to the lunar surface or other destinations.

"(c) COST-EFFECTIVENESS.—In order to maximize the cost-effectiveness of the long-term space exploration and utilization activities of the United States, the Administrator shall take all necessary steps, including engaging international, academic, and industry partners, to ensure that activities in the Administration's human space exploration program balance how those activities might also help meet the requirements of future exploration and utilization activities leading to human habitation on the surface of Mars.

"(d) COMPLETION.—Within budgetary considerations, once an exploration-related project enters its development phase, the Administrator shall seek, to the maximum extent practicable, to complete that project without undue delays.

"(e) INTERNATIONAL PARTICIPATION.—In order to achieve the goal of successfully conducting a crewed mission to the surface of Mars, the President may invite the United States partners in the ISS program and other na-

tions, as appropriate, to participate in an international initiative under the leadership of the United States.".

(b) DEFINITION OF CIS-LUNAR SPACE.—Section 10101 of title 51, United States Code, is amended by adding at the end the following:

"(3) CIS-LUNAR SPACE.—The term 'cis-lunar space' means the region of space beyond low-Earth orbit out to and including the region around the surface of the Moon.".

(c) TECHNICAL AND CONFORMING AMENDMENTS.—Section 3 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18302) is amended by striking paragraphs (2) and (3) and inserting the following:

"(2) APPROPRIATE COMMITTEES OF CONGRESS.—The term 'appropriate committees of Congress' means—

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

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

"(3) CIS-LUNAR SPACE.—The term 'cis-lunar space' means the region of space beyond low-Earth

orbit out to and including the region around the surface of the Moon.".

SEC. 207. SPACE LAUNCH SYSTEM CONFIGURATIONS.

(a) MOBILE LAUNCH PLATFORM.—The Administrator is authorized to maintain 2 operational mobile launch platforms to enable the launch of multiple configurations of the Space Launch System.

(b) ENHANCED UPPER STAGE.—In order to meet the capability requirements under section 302(c)(2) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322 (c)(2)), the Administrator shall continue development of the enhanced upper stage for the Space Launch System with a scheduled availability date of not later than the third flight of the Space Launch System.

(c) BRIEFING.—Not later than 90 days after the date of enactment of this Act, the Administrator shall brief the appropriate committees of Congress on the development and scheduled availability of the enhanced upper stage.

SEC. 208. ADVANCED SPACE SUITS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) next-generation advanced space suits are a critical technology for human space exploration be-

yond low-Earth orbit, including exploration of cis-lunar space, the surface of the Moon, and Mars;

(2) NASA should establish a detailed plan to develop advanced space suits consistent with its deep space exploration goals and timetables; and

(3) throughout the operational life of the ISS, NASA should fully utilize the ISS for testing advanced space suits.

(b) PRIOR INVESTMENTS.—In developing an advanced space suit, NASA shall leverage prior and existing investments in advanced space suit technologies to the greatest extent practicable in order to maximize the benefits of such investments and technologies.

SEC. 209. ACQUISITION OF SPACE TRANSPORTATION SERVICES.

Section 50131 of title 51, United States Code, is amended by adding at the end the following:

"(f) APPLICABILITY.—This section shall apply to all acquisitions of space transportation services by the Federal Government, including acquisitions of such services for International Space Station cargo and crew.".

SEC. 210. 21ST CENTURY SPACE LAUNCH INFRASTRUCTURE.

(a) IN GENERAL.—The Administrator shall carry out a program to modernize launch infrastructure at NASA

facilities to enhance safety and to advance Government and commercial space transportation and exploration.

(b) PROJECTS.—Projects funded under the program under subsection (a) may include—

(1) infrastructure related to commodities;

(2) standard interfaces for multiple payload and launch vehicle processing customer needs;

(3) enhancements to range capacity and flexibility; and

(4) such other projects as the Administrator determines meet the goals described in subsection (a).

(c) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) prioritize investments in projects that can be used by multiple users and launch vehicles, including non-NASA users and launch vehicles; and

(2) limit investments to projects that would not otherwise be funded by a NASA program, such as an institutional or programmatic infrastructure program.

(d) SAVINGS CLAUSE.—Nothing in this section shall preclude a NASA program, including the Space Launch System and Orion, from utilizing the modernized launch infrastructure under the program under subsection (a).

SEC. 211. INDIAN RIVER BRIDGE.

(a) IN GENERAL.—NASA shall continue to ensure the Indian River Bridge continues to provide access to the Eastern Range for national security, civil, and commercial space operations.

(b) TRANSFER OF FUNDS.—In accordance with section 20113 of title 51, United States Code, the Administrator is authorized to accept money from other Federal agencies to upgrade the Indian River Bridge.

SEC. 212. ISS NATIONAL LABORATORY; PROPERTY RIGHTS IN INVENTIONS.

(a) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, is amended by adding at the end the following:

"§ 20150. Property rights in designated inventions

"(a) EXCLUSIVE PROPERTY RIGHTS.—Notwithstanding section 3710a of title 15, chapter 18 of title 35, section 20135 of this title, or any other provision of law to the contrary, a designated invention shall be the exclusive property of a user, and shall not be subject to a Government-purpose license, if—

"(1) the Administration is reimbursed under the terms of the contract for the total cost of any contribution by the Government of the use of Government facilities, equipment, materials, information proprietary to the Government, or services of a Gov-

ernment employee during working hours, including the cost for the Administration to carry out its responsibilities under paragraphs (1) and (4) of section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d));

"(2) no Government funds are transferred to the user under the contract; and

"(3) the invention was made—

"(A) solely by the user; or

"(B) by the user with the services of a Government employee under the terms of the contract and the Government is reimbursed for such services under paragraph (1).

"(b) RULE OF CONSTRUCTION.—Nothing in this section may be construed to affect the rights of the Federal Government, including property rights in inventions, under any contract, except for a written contract with the Administration or ISS management entity for the performance of designated activities.

"(c) DEFINITIONS.—In this section—

"(1) CONTRACT.—The term 'contract' has the meaning giving the term in section 20135(a).

"(2) DESIGNATED ACTIVITIES.—The term 'designated activities' means any non-NASA scientific

utilization of the ISS national laboratory as described in section 504 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354).

"(3) DESIGNATED INVENTION.—The term 'designated invention' means any invention or class of inventions made or that may be made by any person in the performance of designated activities under a written contract with the Administration or the ISS management entity.

"(4) GOVERNMENT-PURPOSE LICENSE.—The term 'Government-purpose license' means a reservation by the Government of an irrevocable, nonexclusive, nontransferable, royalty-free license for the practice of an invention throughout the world by or on behalf of the United States or any foreign government pursuant to any treaty or agreement with the United States.

"(5) ISS MANAGEMENT ENTITY.—The term 'ISS management entity' means the organization with which the Administrator enters into a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

"(6) MADE.—The term 'made' has the meaning given the term in section 20135(a).

"(7) NONPROFIT ORGANIZATION.—The term 'nonprofit organization' has the meaning given the term in section 201 of title 35.

"(8) SMALL BUSINESS FIRM.—The term 'small business firm' has the meaning given the term in section 201 of title 35.

"(9) USER.—The term 'user' means a person (as defined in section 1 of title 1), including a nonprofit organization or small business firm, or class of persons that enters into a written contract with the Administration or the ISS management entity for the performance of designated activities.".

(b) TABLE OF CONTENTS.—The table of contents for chapter 201 of title 51, United States Code, is amended by inserting after the item relating to section 20149 the following:

"20150. Property rights in designated inventions.".

SEC. 213. DATA FIRST PRODUCED DURING NON-NASA SCIENTIFIC UTILIZATION OF THE ISS NATIONAL LABORATORY.

(a) DATA RIGHTS.—Subchapter III of chapter 201 of title 51, United States Code, as amended by section 212 of this Act, is further amended by adding at the end the following:

"§ 20151. Data rights

"(a) NON-NASA SCIENTIFIC UTILIZATION OF THE ISS NATIONAL LABORATORY.—The Federal Government may not use or reproduce, or disclose outside of the Government, any data first produced in the performance of designated activities under a written contract with the Administration or the ISS management entity, unless—

"(1) otherwise agreed under the terms of the contract with the Administration or the ISS management entity, as applicable;

"(2) any funding for the designated activities is from a Federal source;

"(3) disclosure is required by law;

"(4) the Government has rights in the data under another Federal contract, grant, cooperative agreement, or other transaction;

"(5) otherwise lawfully acquired by the Government;

"(6) related to the health and safety of personnel on the ISS; or

"(7) essential to the performance of work by the ISS management entity or NASA personnel.

"(b) DEFINITIONS.—In this section:

"(1) CONTRACT.—The term 'contract' has the meaning given the term under section 20135(a).

"(2) DATA.—

"(A) IN GENERAL.—The term 'data' means recorded information, regardless of form or the media on which it may be recorded.

"(B) INCLUSIONS.—The term 'data' includes technical data and computer software.

"(C) EXCLUSIONS.—The term 'data' does not include information incidental to contract administration, such as financial, administrative, cost or pricing, or management information.

"(3) DESIGNATED ACTIVITIES.—The term 'designated activities' has the meaning given the term under section 20150.

"(4) ISS MANAGEMENT ENTITY.—The term 'ISS management entity' has the meaning given the term under section 20150.".

(b) SPECIAL HANDLING OF TRADE SECRETS OR CONFIDENTIAL INFORMATION.—Section 20131(b)(2) of title 51, United States Code, is amended to read as follows:

"(2) INFORMATION DESCRIBED.—

"(A) ACTIVITIES UNDER AGREEMENT.—Information referred to in paragraph (1) is information that results from activities conducted under an agreement entered into under sub-

sections (e) and (f) of section 20113 of this title, and that would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of section 552(b)(4) of title 5 if the information had been obtained from a non-Federal party participating in such an agreement.

"(B) CERTAIN DATA.—Information referred to in paragraph (1) includes data first produced by the Administration in the performance of any designated activities (as defined in section 20150 of this title), and that would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of section 552(b)(4) of title 5 if the data had been obtained from a non-Federal party. In this subparagraph, the term 'data' has the meaning given the term under section 20151.".

(c) TABLE OF CONTENTS.—The table of contents for chapter 201 of title 51, United States Code, as amended by section 212 of this Act, is further amended by inserting after the item relating to section 20150 the following:

"20151. Data rights.".

SEC. 214. ROYALTIES AND OTHER PAYMENTS RECEIVED FOR DESIGNATED ACTIVITIES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that NASA should determine a threshold for which it may be appropriate for NASA to recuperate the costs of supporting the creation of invention aboard the ISS, through the negotiation of royalties, similar to agreements made by other Federal agencies that support private sector innovation.

(b) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, as amended by section 213 of this Act, is further amended by adding at the end the following:

"§ 20152. Royalties and other payments received for designated activities

"(a) DESIGNATED INVENTIONS MADE WITH FEDERAL ASSISTANCE.—If the Administration is required to provide, unreimbursed, the total cost of any contribution by the Government of the use of Government facilities, equipment, materials, information proprietary to the Government, or services of a Government employee during working hours, including the cost for the Administration to carry out its responsibilities under paragraphs (1) and (4) of section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)), under the terms of any written contract

for the performance of designated activities, the Administrator, notwithstanding any other law to the contrary, shall negotiate and agree upon the terms and rates of royalty payments with respect to any invention or class of inventions made or which may be made by any person or class of persons in the performance of such designated activities.

"(b) LICENSING AND ASSIGNMENT OF INVENTIONS.—Notwithstanding sections 3710a and 3710c of title 15, or any other provision of law to the contrary, the balance of any royalties or other payments received by the Administrator or ISS management entity from licensing and assignment of inventions under a written contract with the Administration or ISS management entity for the performance of designated activities, after payment in accordance with section 3710c(a)(1)(A)(i) to the inventors who have directly assigned their interests in such inventions to the Government, shall be paid to the Space Exploration Fund by the Administrator or ISS management entity, as applicable.

"(c) SPACE EXPLORATION FUND.—

"(1) ESTABLISHMENT.—There is established in the Treasury a fund to be known as the Space Exploration Fund, to be administered by the Administrator, to be available without fiscal year limitation

and without further appropriation, for carrying out Administration-related space exploration activities under section 20302 of this title.

"(2) DEPOSITS.—There shall be deposited in the Space Exploration Fund—

"(A) amounts appropriated to the fund;

"(B) fees and royalties collected by the Administrator or ISS management entity under subsections (a) and (b) of this section; and

"(C) donations or contributions accepted by the Administrator to support authorized activities.

"(3) RULE OF CONSTRUCTION.—Any amount under this subsection shall be in addition to amounts otherwise made available for the purpose described in paragraph (1).

"(d) DEFINITIONS.—The terms used in this section have the meanings given the terms in section 20150.".

(c) TABLE OF CONTENTS.—The table of contents for chapter 201 of title 51, United States Code, as amended by section 213 of this Act, is further amended by inserting after the item relating to section 20151 the following:

"20152. Royalties and other payments received for designated activities.".

TITLE III—SCIENCE

SEC. 301. SCIENCE PRIORITIES.

(a) REAFFIRMATION.—Congress reaffirms the sense of Congress under section 501 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115–10; 131 Stat. 18) that—

(1) a balanced and adequately funded set of activities, consisting of research and analysis grant programs, technology development, suborbital research activities, and small, medium, and large space missions, contributes to a robust and productive science program and serves as a catalyst for innovation and discovery; and

(2) the Administrator should set science priorities by following the guidance provided by the scientific community through the National Academies of Sciences, Engineering, and Medicine's decadal surveys.

(b) DECADAL RESULTS.—Section 805 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18384) is amended—

(1) by inserting "(a) IN GENERAL.—" before "NASA"; and

(2) by adding at the end the following:

"(b) PRIORITY CHANGES.—If scientific discoveries or external factors compel NASA to reassess decadal survey priorities, NASA shall, to the greatest extent practicable, consult with the relevant National Academies committees.".

SEC. 302. LUNAR DISCOVERY PROGRAM.

(a) IN GENERAL.—The Administrator may carry out a program to conduct lunar science research, including missions to the surface of the Moon, if that program contributes materially to the objective described in section 20102(d)(1) of title 51, United States Code.

(b) COMMERCIAL LANDERS.—In carrying out the program under subsection (a), the Administrator shall procure the services of commercial landers developed primarily by United States industry to land science payloads on the lunar services.

(c) NATIONAL ACADEMIES.—Lunar science research funded by the program carried out under subsection (a) shall be consistent with recommendations made by the National Academies.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

(1) $218,000,000 for fiscal year 2019, of which $18,000,000 shall be made available for the operation of the Lunar Reconnaissance Orbiter; and

(2) $218,000,000 for each fiscal year thereafter, of which $18,000,000 shall be made available, in each fiscal year that the Lunar Reconnaissance Orbiter is operational, for the operation of the Lunar Reconnaissance Orbiter.

SEC. 303. SEARCH FOR LIFE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the 2018 National Academies Astrobiology Strategy for the Search for Life in the Universe outlines the key scientific questions and methods for fulfilling NASA's objective to search for life's origin, evolution, distribution, and future in the universe.

(b) PROGRAM AUTHORIZED.—

(1) IN GENERAL.—In support of the objective described in section 20102(d)(10) of title 51, United States Code, the Administrator shall continue to implement a collaborative, multidisciplinary science and technology development program to search for proof of the existence or historical existence of life beyond Earth.

(2) CONTENTS.—The program under paragraph (1) shall include astronomy, biology, geology, and planetary science.

(3) TECHNOSIGNATURES.—In carrying out the program under paragraph (1), the Administrator may fund activities to search for and analyze technosignatures.

SEC. 304. JAMES WEBB SPACE TELESCOPE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the James Webb Space Telescope will be the next premier observatory in space and has a great potential to help to further scientific study and assist scientists in making new discoveries in the field of astronomy;

(2) the James Webb Space Telescope was developed as an ambitious project with a scope that was not fully defined at inception and with risk that was not fully known or understood;

(3) despite the major technology development and innovation that was needed to construct the James Webb Space Telescope, major negative impacts to the cost and schedule of the James Webb Space Telescope resulted from poor program management and poor contractor performance;

(4) the Administrator should take into account the lessons learned from the cost and schedule issues realized in developing the James Webb Space Telescope when making decisions regarding the scope of and the technologies needed for future scientific missions;

(5) the Administrator should take into account the impact large programs that overrun cost and schedule may have on other NASA programs in earlier phases of development when selecting future scientific missions; and

(6) the Administration should continue to develop the James Webb Space Telescope with a development cost (as defined in section 30104 of title 51, United States Code) of no more than $9,000,000,000 as estimated by the James Webb Space Telescope Independent Review Board report released in May 2018.

(b) REQUIREMENTS.—

(1) IN GENERAL.—The Administrator shall continue—

(A) to closely observe the performance of the James Webb Space Telescope project; and

(B) to improve the reliability of cost estimates and contractor performance data

throughout the development of the James Webb Space Telescope.

(2) KEY PROGRAM OBJECTIVE.—The Administrator shall continue to develop the James Webb Space Telescope on a schedule to meet the objective of safely launching the James Webb Space Telescope before March 31, 2021.

SEC. 305. WIDE-FIELD INFRARED SURVEY TELESCOPE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) a major cost growth in astrophysics Discovery class missions has been harmful to the overall portfolio balance; and

(2) the Administrator should continue to develop the Wide-Field Infrared Survey Telescope with a development cost (as defined in section 30104 of title 51, United States Code) of no more than $3,200,000,000.

(b) REQUIREMENTS.—The Administrator shall continue to develop the Wide-Field Infrared Survey Telescope to meet the objectives outlined in the 2010 National Academies' Astronomy and Astrophysics Decadal Survey in a way that maximizes the scientific productivity of meeting those objectives for the resources invested.

SEC. 306. SENSE OF CONGRESS REGARDING SMALL SATELLITE SCIENCE.

It is the sense of Congress that—

(1) small satellites are increasingly robust, effective, and affordable platforms for carrying out space science missions;

(2) small satellites can work in tandem with or augment NASA's larger spacecraft to support NASA's high-priority science missions;

(3) small satellites are cost effective solutions that may allow NASA to continue collecting legacy observations while developing next generation science missions; and

(4) NASA should continue to support small satellite research, development, technologies, and programs.

SEC. 307. STUDY ON SATELLITE SERVICING FOR SCIENCE MISSIONS.

(a) FEASIBILITY STUDY.—Not later than 1 year after the date of enactment of this Act, the Administrator shall—

(1) study the feasibility of using in-space robotic refueling, repair, or refurbishment capabilities to extend the useful life of telescopes and other science missions currently operational or in development; and

(2) submit to the appropriate committees of Congress and the National Academies Space Studies Board, for its consideration during formulation of upcoming decadal surveys, a report on the study.

(b) CONTENTS.—The study shall include the projected cost of such activities, including the cost of extended operations for refurbished science missions.

SEC. 308. EARTH SCIENCE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that NASA's Earth Science Division plays an important role in national efforts to collect and use Earth observations in service to society and to understand global change.

(b) EARTH SCIENCE PROGRAM.—The Administrator shall, to the extent practicable, follow the recommendations and guidance provided by the scientific community through the National Academies of Sciences, Engineering, and Medicine decadal survey for Earth Science, including the following:

(1) The science priorities established by the decadal survey.

(2) The execution of the series of existing or previously planned observations, known as the program of record.

(3) The development of cost-capped medium- and large-size missions.

(4) Opportunities for a mid-size principal investigator-led, competitively selected explorer class missions.

(5) The development of the Venture-continuity class of small satellite missions in order to provide opportunity for low-cost sustained observations.

TITLE IV—AERONAUTICS

SEC. 401. SHORT TITLE.

This title may be cited as the "Aeronautics Innovation Act".

SEC. 402. DEFINITIONS.

In this title:

(1) AERONAUTICS STRATEGIC IMPLEMENTATION PLAN.—The term "Aeronautics Strategic Implementation Plan" means the Aeronautics Strategic Implementation Plan issued by the NASA Aeronautics Research Mission Directorate.

(2) UNMANNED AIRCRAFT SYSTEM; UNMANNED AIRCRAFT.—The terms "unmanned aircraft system" and "unmanned aircraft" have the meanings given those terms in section 44801 of title 49, United States Code.

(3) X-PLANE.—The term "X-plane" means an experimental aircraft that—

(A) is used to test and evaluate a new technology or aerodynamic concept; and

(B) is operated by NASA or the Air Force.

SEC. 403. EXPERIMENTAL AIRCRAFT PROJECTS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) developing high-risk, precompetitive aerospace technologies for which there is not yet a profit rationale is a fundamental NASA role;

(2) large-scale piloted flight test experimentation and validation are necessary for—

(A) transitioning new technologies and materials, including associated manufacturing processes, for general aviation, commercial aviation, and military aeronautics use; and

(B) capturing the full extent of benefits from the Aeronautics Research Mission Directorate's investments in priority programs called for in—

(i) the National Aeronautics Research and Development Plan issued by the National Science and Technology Council in February 2010;

(ii) the NASA 2014 Strategic Plan;

(iii) the Aeronautics Strategic Implementation Plan; and

(iv) any updates to the programs called for in the plans described in clauses (i) through (iii); and

(3) a level of funding that adequately supports large-scale piloted flight test experimentation and validation, including related infrastructure, must be assured over a sustained period of time to restore NASA's capacity to see legacy priority programs through to completion and achieve national economic and security objectives.

(b) POLICY.—It is the policy of the United State—

(1) to maintain world leadership in military and civilian aeronautical science and technology, global air power projection, and industrialization; and

(2) to maintain as a fundamental objective of NASA aeronautics research the steady progression and expansion of flight research and capabilities, including the science and technology of critical underlying disciplines and competencies, such as—

(A) computational-based analytical and predictive tools and methodologies;

(B) aerothermodynamics;

(C) propulsion;

(D) advanced materials and manufacturing processes; high-temperature structures and materials; and

(E) flight controls.

(c) ESTABLISHMENT OF X-PLANE PROJECTS.—

(1) IN GENERAL.—Consistent with the roadmap for supersonic research under section 604(b) of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115-10; 131 Stat. 18), the Administrator shall establish the following projects:

(A) A low-boom supersonic aircraft project to demonstrate supersonic aircraft designs and technologies that—

(i) reduce sonic boom noise; and

(ii) assist the Administrator of the Federal Aviation Administration in enabling the safe commercial deployment of civil supersonic aircraft technology and the safe and efficient operation of civil supersonic aircraft.

(B) A series of large-scale X-plane demonstrators that—

(i) are developed sequentially or in parallel; and

(ii) are each based on a set of new configuration concepts or technologies determined by the Administrator—

(I) to demonstrate aircraft and propulsion concepts and technologies and related advances in alternative propulsion and energy;

(II) to enable significant increases in energy efficiency and reduced life cycle emissions in the aviation system while reducing noise emissions; and

(III) to demonstrate flight propulsion concepts and technologies.

(2) PROJECT ELEMENTS.—For each project under paragraph (1), the Administrator shall—

(A) include the development of X-planes and all necessary supporting flight test assets;

(B) pursue a robust technology maturation and flight test validation effort;

(C) improve necessary facilities, flight testing capabilities, and computational tools to support the project;

(D) award primary contracts for design, procurement, and manufacturing to United States persons, consistent with international obligations and commitments;

(E) coordinate research and flight test demonstration activities with other Federal agencies, as appropriate, and the United States aviation community; and

(F) ensure that the project is aligned with the Aeronautics Strategic Implementation Plan, and any updates to the Aeronautics Strategic Implementation Plan.

(d) ADVANCED MATERIALS AND MANUFACTURING TECHNOLOGY PROGRAM.—

(1) IN GENERAL.—The Administrator may establish an advanced materials and manufacturing technology program that—

(A) consists of new material developments, from base material formulation through full-scale structural validation and manufacture;

(B) will develop advanced materials and manufacturing processes to reduce the cost of manufacturing scale-up and certification for use in general aviation, commercial aviation, and military aeronautics;

(C) will reduce the time it takes to design, industrialize, and certify advanced materials and manufacturing processes, including manufacturing; and

(D) will address global cost competitiveness for United States aeronautical industries and technological leadership in advanced materials and manufacturing technology.

(2) CONTENTS.—In carrying out the program under paragraph (1), the Administrator shall—

(A) build on work that was carried out by the Advanced Composites Project of NASA;

(B) partner with the private and academic sector, including members of the Advanced Composites Consortium, as appropriate;

(C) coordinate with advanced manufacturing and composites initiatives in other NASA mission directorates, as the Administrator considers appropriate; and

(D) comply with existing Federal Aviation Administration regulations for use within programs in general aviation, commercial aviation, and military aeronautics.

SEC. 404. ON-DEMAND AIR TRANSPORTATION.

It is the sense of Congress that—

(1) greater use of high-speed air transportation, small airports, helipads, vertical flight infrastructure, and other aviation-related infrastructure can alleviate surface transportation congestion and support economic growth within cities;

(2) NASA should continue—

(A) to conduct research focused on concepts, technologies, and design tools; and

(B) to support the evaluation of advanced technologies and operational concepts that can be leveraged by—

(i) industry to develop future vehicles and systems; and

(ii) the Federal Aviation Administration to support vehicle safety and operational certification; and

(3) NASA should leverage ongoing efforts to develop advanced technologies to actively support the research needed for on-demand air transportation.

SEC. 405. UNMANNED AIRCRAFT SYSTEMS.

(a) UNMANNED AIRCRAFT SYSTEMS OPERATION PROGRAM.—The Administrator shall—

(1) research, develop, and test capabilities and concepts, including unmanned aircraft systems communications and spectrum-related resources, for in-

tegrating unmanned aircraft systems into the national airspace system;

(2) leverage NASA's partnership with industry focused on the advancement of technologies for future air traffic management systems for unmanned aircraft systems; and

(3) continue to align NASA's research and testing portfolio to inform unmanned aircraft system integration consistent with public safety and national security objectives.

(b) COORDINATION WITH THE FEDERAL AVIATION ADMINISTRATION.—It is the sense of Congress that—

(1) NASA should continue—

(A) to coordinate with the Federal Aviation Administration on research on air traffic management systems for unmanned aircraft systems; and

(B) to assist the Federal Aviation Administration in the integration of unmanned aircraft systems traffic management systems in the national airspace system; and

(2) the test ranges (as defined in section 44801 of title 49, United States Code) should continue to be leveraged to research unmanned aircraft system

integration and unmanned aircraft systems traffic management.

SEC. 406. 21ST CENTURY AERONAUTICS RESEARCH CAPABILITIES INITIATIVE.

(a) ESTABLISHMENT.—The Administrator may establish a 21st Century Aeronautics Capabilities Initiative, within the Construction and Environmental Compliance and Restoration Account, to ensure that NASA possesses the infrastructure and capabilities necessary to conduct proposed flight demonstration projects across the range of NASA aeronautics interests.

(b) ACTIVITIES.—As part of the 21st Century Aeronautics Capabilities Initiative, the Administrator may carry out the following activities:

(1) Any investments the Administrator considers necessary to upgrade and create facilities for civil and national security aeronautics research to support advancements in long-term foundational science and technology, advanced aircraft systems, air traffic management systems, fuel efficiency and electric propulsion technologies, system-wide safety assurance, autonomous aviation, and supersonic and hypersonic aircraft design and development.

(2) Any measures the Administrator considers necessary to support flight testing activities, including—

(A) continuous refinement and development of free-flight test techniques and methodologies;

(B) upgrades and improvements to real-time tracking and data acquisition; and

(C) such other measures related to aeronautics research support and modernization as the Administrator considers appropriate to carry out the scientific study of the problems of flight, with a view to their practical solutions.

SEC. 407. HYPERSONIC TECHNOLOGY RESEARCH PROJECTS.

It is the sense of Congress that—

(1) hypersonic technology is critical to the development of advanced high-speed aerospace vehicles for both civilian and national security purposes;

(2) for hypersonic vehicles to be realized, research is needed to overcome technical challenges, including in propulsion, advanced materials, and entry, descent, and landing;

(3) NASA plays a critical role in supporting fundamental hypersonic research and testing;

(4) NASA research efforts in hypersonic technology complement research supported by the Department of Defense and contributions from both agencies working in partnership with universities and industry are necessary to overcome key technical challenges;

(5) previous coordinated research programs between NASA and the Department of Defense enabled important progress on hypersonic technology;

(6) the commercial sector could provide flight platforms and other capabilities that can host and support NASA hypersonic technology research projects; and

(7) in carrying out hypersonic technology research projects, the Administrator should—

(A) focus research and development efforts on high-speed propulsion systems, reusable vehicle technologies, high-temperature materials, and systems analysis;

(B) coordinate with the Department of Defense to prevent duplication of efforts and of investments;

(C) include partnerships with universities and industry to accomplish research goals; and

(D) maximize public-private utilization of commercially-available platforms for hosting research and development flight projects.

TITLE V—SPACE TECHNOLOGY

SEC. 501. SPACE TECHNOLOGY MISSION DIRECTORATE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that an independent Space Technology Mission Directorate is critical to ensuring continued investments in the development of technologies for missions across NASA's portfolio, including science and human exploration.

(b) REQUIREMENT.—NASA shall maintain a Space Technology Mission Directorate consistent with section 702 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (51 U.S.C. 20301 note).

SEC. 502. FLIGHT OPPORTUNITIES PROGRAM.

Congress reaffirms that the Administrator should provide flight opportunities for payloads to microgravity environments and suborbital altitudes as authorized by section 907 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405).

TITLE VI—STEM ENGAGEMENT

SEC. 601. SENSE OF CONGRESS.

It is the sense of Congress that—

(1) NASA serves as a source of inspiration to many United States citizens and is uniquely positioned to help increase United States students' interest in science, technology, engineering, and math;

(2) engaging students in science, technology, engineering, and math and providing hands-on experience at an early age are important aspects of ensuring and promoting United States leadership in innovation; and

(3) NASA should strive to use its unique position—

(A) to increase K-12 involvement in NASA projects;

(B) to enhance higher education in the United States; and

(C) to support underrepresented populations, such as women, underrepresented minorities, and persons in rural areas, in the fields of science, technology, engineering, and math.

SEC. 602. STEM ENGAGEMENT ACTIVITIES.

(a) IN GENERAL.—The Administrator shall continue to carry out opportunities for both formal and informal STEM engagement activities either within the Office of

STEM Engagement or within other directorates, including the following:

(1) Established Program to Stimulate Competitive Research.

(2) Minority University Research and Education Project.

(3) National Space Grant College and Fellowship Program.

(b) BRIEFING.—Not later than 1 year after the date of enactment of this Act, the Administrator shall brief the appropriate committees of Congress on—

(1) the status of the programs listed under subsection (a); and

(2) how all other STEM engagement activities at NASA are organized and funded.

(c) DEFINITION OF STEM.—In this section, the term "STEM" means science, technology, engineering, and mathematics, including computer science.

TITLE VII—MISCELLANEOUS

SEC. 701. PROTECT CERTAIN TECHNICAL DATA FROM PUBLIC DISCLOSURE.

Section 20131 of title 51, United States Code, as amended in section 213 of this Act, is further amended—

(1) by redesignating subsection (c) as subsection (d);

(2) in subsection (a)(3), by striking ''subsection (b)'' and inserting ''subsection (b) or subsection (c)''; and

(3) by inserting after subsection (b) the following:

''(c) SPECIAL HANDLING OF CERTAIN TECHNICAL DATA.—

''(1) IN GENERAL.—The Administrator may provide appropriate protections against the dissemination of certain technical data, including exemption from subchapter II of chapter 5 of title 5.

''(2) DEFINITIONS.—In this subsection:

''(A) CERTAIN TECHNICAL DATA.—The term 'certain technical data' means technical data that may not be exported lawfully outside the United States without approval, authorization, or license under—

''(i) the Export Control Reform Act of 2018 (Public Law 115–232; 132 Stat. 2208); or

''(ii) the International Security Assistance and Arms Export Control Act of 1976 (Public Law 94–329; 90 Stat. 729).

''(B) TECHNICAL DATA.—The term 'technical data' means any blueprint, drawing, pho-

tograph, plan, instruction, computer software, or documentation, or other technical information that is required to design, develop, engineer, produce, manufacture, assemble, operate, repair, test, maintain, overhaul, modify, or reproduce any aeronautical, space, or other export controlled item, including any related subsystem, component, or part therefor, or technology.";

(4) in subsection (d), as redesignated, by inserting ", including any data," after "information"; and

(5) by adding at the end the following:

"(e) SECTION 552 OF TITLE 5.—For purposes of section 552 of title 5, this section shall be considered a statute described in subsection (b)(3)(B) of that section.".

SEC. 702. PROTECTING CERTAIN VOLUNTARILY-PROVIDED, SAFETY-RELATED INFORMATION FROM PUBLIC DISCLOSURE.

(a) IN GENERAL.—Whenever the Administrator collects safety-related information as part of a mishap investigation, under the NASA Safety Reporting System or as part of an organizational safety assessment, the Administration, the Administration shall provide appropriate protections against the dissemination of safety-related information if the Administrator determines that—

(1) disclosure of the information would inhibit the voluntary provision of that type of information; and

(2)(A) receipt of that information aids in improving the safety of NASA's programs and NASA's research related to aeronautics and space; or

(B) withholding such information from disclosure is consistent with improving the safety of NASA's programs and NASA's research related to aeronautics and space.

(b) OTHER FEDERAL AGENCIES.—If the Administrator provides to the head of another Federal agency safety-related information described in subsection (a) with respect to which the Administrator has made a determination described in that subsection, the head of that Federal agency shall (notwithstanding any other provision of law) withhold the information from public disclosure.

(c) TRANSPARENCY.—Each determination of the Administration under subsection (a) shall be made in writing and accompanied by a statement of the basis for the determination. All such determinations and statements of basis shall be available to the public, upon request.

(d) REGULATIONS.—The Administrator shall issue regulations to carry out this section.

(c) SECTION 552 OF TITLE 5.—For purposes of section 552 of title 5, this section shall be considered a statute described in subsection (b)(3)(B) of that section.

SEC. 703. SMALL SATELLITE LAUNCH SERVICES PROGRAM.

(a) IN GENERAL.—The Administrator shall continue to procure dedicated launch services for cubesats and small satellites for the purpose of conducting science and technology missions that further the agency's goals.

(b) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) engage with the academic community to maximize awareness and utilization of these dedicated small satellite launch opportunities; and

(2) to the maximum extent practicable, utilize secondary payload of procured launch services for cubesats.

SEC. 704. LIMITATIONS ON COOPERATION WITH THE PEOPLE'S REPUBLIC OF CHINA.

(a) LIMITATIONS.—NASA, OSTP, and the National Space Council, are prohibited from—

(1) developing, designing, planning, promulgating, implementing, or executing a bilateral policy, program, order, or contract of any kind to participate, collaborate, or coordinate bilaterally in any way with the People's Republic of China, or any

company owned by the People's Republic of China or incorporated under the laws of the People's Republic of China, unless such activities are specifically authorized by a law enacted after the date of enactment of this Act; and

(2) hosting official visitors from the People's Republic of China at facilities belonging to or utilized by NASA.

(b) EXCEPTIONS.—The limitations described in subsection (a) shall not apply to activities which the head of NASA, OSTP, or the National Space Council certifies—

(1) will pose no risk of resulting in the transfer of technology, data, or other information with national security or economic security implications to the People's Republic of China, or to any company owned by the People's Republic of China or incorporated under the laws of the People's Republic of China; and

(2) will not involve knowing interactions with officials who have been determined by the United States to have direct involvement with violations of human rights.

(c) SUBMISSION TO CONGRESS.—Not later than 30 days after the date that a certification is made under subsection (b), the head of NASA, OSTP, or the National

Space Council, as applicable, shall transmit the certification to the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate and the Committee on Science, Space, and Technology and the Committee on Appropriations of the House of Representatives.

SEC. 705. CYBERSECURITY.

(a) SPACE CYBERSECURITY.—Section 20301 of title 51 is amended by adding at the end the following:

"(c) CYBERSECURITY.—The Administrator shall update and improve, as necessary, the cybersecurity of the space assets and supporting infrastructure within the Administration's domain.".

(b) SECURITY OPERATIONS CENTER.—

(1) IN GENERAL.—The Administrator shall maintain a Security Operations Center to identify and respond to cybersecurity threats to NASA information technology systems, including, when appropriate, institutional systems and mission systems.

(2) INSPECTOR GENERAL OF NASA RECOMMENDATIONS.—Not later than 18 months after the date of enactment of this Act, in carrying out paragraph (1), the Administrator shall implement each of the recommendations of the Inspector Gen-

eral of NASA in the report issued May 23, 2018 (IG–18–020), including the following:

(A) Developing a charter and set of authorities approved by the Administrator that addresses the Security Operation's Center organizational placement, purpose, authority, and responsibilities.

(B) Establishing Operational Level Agreements with NASA Centers, Mission Directorates, and other divisions to direct the roles and data visibility Administration-wide.

(C) Developing initiatives to improve Administration-wide visibility.

(D) Identifying and reducing unnecessary duplication to incident monitoring, detection, and response capabilities.

(c) GAO PRIORITY RECOMMENDATIONS.—Not later than 18 months after the date of enactment of this Act, the Administrator shall implement the priority recommendations of the Comptroller General of the United States in the report issued May 18, 2016, (GAO–16–501) pertaining to information security controls over select high-impact systems, including—

(1) re-evaluating security control assessments; and

(2) specifying metrics to be used as part of the Administration's continuous monitoring strategy.