

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The Committee recommends \$22,315,000,000 for the National Aeronautics and Space Administration (NASA), which is \$815,000,000 above fiscal year 2019, and \$1,296,000,000 above the initial requested level.

NASA's initial fiscal year 2020 budget request, which is \$481,000,000 less than the fiscal year 2019 appropriated level, clearly reflects the Administration's unfortunate shift from legacy programs and programs with clear environmental and educational interests.

The Administration's shift in priorities is most evident in its budget request of nearly \$1,200,000,000 (over \$700,000,000 above the fiscal year 2019 level) for the Lunar Orbital Platform—Gateway and Advanced Cislunar and Surface Capabilities initiatives. These programs strive to establish a permanent human presence on the Moon, and deploy a spaceship, called the Gateway, in orbit around the Moon to support human missions to the lunar surface. These activities are planned to be the first steps in human exploration from the Moon to Mars.

To increase funding for this Moon base and Gateway orbiter, the Administration chose to either reduce or eliminate many critical legacy programs, including Earth science programs that help monitor the environment, measure global climate change, and track rising sea levels. These programs include: The Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) Earth-observing satellite; the Climate Absolute Radiance and Refractivity Observatory (CLARREO) sensor on the International Space Station, designed to lay the foundation for future long-term observations of Earth's climate; and NASA's Carbon Monitoring System that achieves levels of precision and accuracy to monitor, report, and verify the levels of carbon stocks and fluxes in Earth's atmosphere.

Additional programs that were proposed for elimination in the Administration's budget request are: The Wide Field Infrared Survey Telescope (WFIRST), a NASA observatory designed to work in conjunction with the James Webb Space Telescope, with a view 100 times greater than the Hubble telescope; and the entire Science, Technology, Engineering, and Mathematics (STEM) Engagement account.

The Committee rejects these proposals and has included an additional \$881,100,000 above the request to support these critical programs, including additional funding to increase the availability of competitive research grants within Earth Science and a nearly twelve percent increase over the fiscal year 2019 level for Science, Technology, Engineering and Mathematics Engagement.

Program and project totals.—The Committee's program and project recommendations for NASA are included in the consolidated funding table below and in narrative direction throughout this report. The Committee reminds NASA that any deviations from the amounts included in the table below are subject to section 505 requirements of this Act. When executing its budget for fiscal year 2020, NASA shall incorporate the funding levels established in both the table and the narrative direction. NASA is reminded that comity has existed between the Congress and the Executive Branch with respect to abiding by language included in this report and in

the accompanying bill. The Committee expects NASA to respect this long-standing practice.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
(In thousands of dollars)

Program	Amount
Science:	
Earth Science	\$2,023,100
Planetary Science	2,713,400
Astrophysics	1,367,700
James Webb Space Telescope	352,600
Heliophysics	704,500
Total, Science	7,161,300
Aeronautics	700,000
Space Technology	1,291,600
Exploration:	
Orion Multi-purpose Crew Vehicle	1,425,000
Space Launch System (SLS) Vehicle Deployment	2,150,000
Exploration Ground Systems	592,800
Exploration Research and Development	962,100
Total, Exploration	5,129,900
Space Operations	4,285,700
Science, Technology, Engineering, and Mathematics (STEM)	123,000
Safety, Security and Mission Services	3,084,600
Construction and Environmental Compliance and Restoration	497,200
Office of Inspector General	41,700
Total, NASA	\$22,315,000

SCIENCE

The Committee provides \$7,161,300,000 for Science, which is \$255,600,000 above the fiscal year 2019 appropriation and \$857,600,000 above the request.

Earth Science.—The recommendation includes \$2,023,100,000 for Earth Science programs. Despite the overwhelming benefits to the economy, coastal regions, and to humankind generally, the Administration eliminated virtually all major missions to incorporate selected ocean color and atmospheric aerosol measurement capabilities needed to ensure continuity and additional capability in the measurement record, and to demonstrate measurement technologies for a larger future mission to improve detection of climate trends. These missions, aimed at understanding the Earth system and its response to natural and human-induced forces and changes, will help determine how to predict future changes and mitigate or adapt to them. In June 2018, the NASA Administrator told a U.S. Senate panel that NASA should continue to monitor the Earth's carbon dioxide emissions that contribute to global warming. Despite the Administrator's persuasive argument, the President's fiscal year 2020 budget request chose to eliminate missions totaling

nearly \$190,000,000 that address human-induced forces with regard to climate change. The Committee rejects this proposal, and has included sufficient funding to continue such programs, and expects NASA to comply with Committee direction.

Earth Science Research and Analysis and Carbon Monitoring.—The Committee recommends \$508,200,000 for Earth Science Research, which is \$54,100,000 greater than the fiscal year 2019 appropriation, and \$60,300,000 greater than the Administration's request. Within this total, NASA shall provide not less than \$356,500,000 for Earth Science Research and Analysis, of which \$10,000,000 is directed for the Carbon Monitoring System, which was eliminated in the Administration's fiscal year 2020 budget request.

Plankton, Aerosol, Cloud, ocean Ecosystem (PACE).—The Committee provides \$147,000,000, which is \$14,000,000 below the fiscal year 2019 appropriation, and \$147,000,000 greater than the Administration's request, which would have eliminated this mission. The Committee does not concur with the Administration's proposal to terminate the mission because of its unique scientific value in aiding critical parts of the U.S. coastal economy like commercial fishing. The data to be generated by PACE builds upon a multi-decade effort by NASA and other Federal agencies to generate information from space that helps characterize and assess the health of the fisheries environment and to more accurately assess the status of fish stocks. Such information cannot be replicated elsewhere, and industry itself does not have the financial means to acquire wide scale data such as that generated by PACE and its precursor missions. Therefore, the Committee sees any effort to terminate this mission as shortsighted and based upon incomplete analysis of the benefits of PACE's data to U.S. coastal economies, the provision of which is an inherently governmental responsibility. In providing this appropriation, the Committee directs NASA to provide and report, concurrent with the operating plan, including details on NASA's efforts to maintain a 2022 launch date for this mission. Therefore, the Committee directs NASA to include adequate funding for PACE in the fiscal year 2021 budget request.

Climate Absolute Radiance and Refractivity Observatory (CLARREO) Pathfinder.—The Committee provides \$26,000,000 for this mission, \$8,000,000 greater than the fiscal year 2019 appropriation, and \$26,000,000 greater than the Administration's request, which would have eliminated the mission. The Committee does not concur with the Administration's proposal to terminate this mission because the CLARREO Pathfinder mission demonstrates measurement technologies required for a future mission recommended in the 2007 decadal survey focused on improving detection of climate trends. Therefore, the Committee directs NASA to include adequate funding for CLARREO in the fiscal year 2021 budget request.

Venture Class Missions.—Within the amounts provided for Earth Science, the Committee recommends up to \$205,200,000 for NASA's Venture Class Missions. NASA's Earth Venture Class Missions provide frequent flight opportunities for high-quality, low-cost Earth science investigations that can be developed and flown in five years or less. NASA selects the investigations through open competitions to ensure broad community involvement and encourage innovative

approaches. Successful investigations enhance our capability to understand the current state of the Earth system and enable continual improvement in the prediction of future changes.

University Small Satellite Missions.—The Committee supports NASA’s collaborative efforts with U.S. colleges and universities to conduct research through small spacecraft missions, including CubeSat and SmallSat missions. The Committee believes these competitively selected projects help train the next generation of scientists and provide much-needed research. The Committee directs NASA to provide not less than \$25,000,000 for these missions.

Planetary Science.—The Planetary Science Research program provides the scientific foundation for data returned from NASA missions exploring the solar system. It is also NASA’s primary interface with university faculty and graduate students in this field and the research community in general. These studies enable planetary scientists to answer specific questions about, and increase the understanding of, the origin and evolution of the solar system.

Lunar Discovery and Exploration.—The Committee supports the requested level of \$210,000,000 for the Lunar Discovery and Exploration program, including \$22,000,000 for the Lunar Reconnaissance Orbiter and \$57,500,000 for the new Lunar Future initiative to address the strategic knowledge gaps important for human exploration of the Moon.

Planetary Defense.—Within Planetary Science, Planetary Defense programs, the Committee provides \$160,000,000 to fund NASA’s Planetary Defense program and recommends not less than \$72,400,000 be made available for the upcoming Double Asteroid Redirection Test (DART) mission. Additionally, within Planetary Defense programs, Other Missions and Data Analysis, funding is included for continued development of the Near Earth Object Camera (NEOCam). The Committee remains supportive of the NEOCam mission, which follows a 2010 National Academy of Sciences report regarding the use of space-based infrared survey telescopes to discover asteroids that pose a hazard to Earth. The recommendation includes no less than the fiscal year 2019 enacted level for NEOCam. The Committee understands that NASA is awaiting a report from the National Academies of Sciences, Engineering, and Medicine (NASEM) to provide independent advice regarding NEOCam in a study to be completed by the second quarter of 2019, pending the internal review process. Additionally, NASA shall maintain no less than current funding levels for its use of the National Science Foundation’s ground-based telescopes to fulfill its planetary protection mission and determine if additional funds are required.

Mars Exploration Program.—The Committee provides \$570,000,000, which is \$23,500,000 greater than the requested level, for the Mars Exploration Program to ensure launch of the Mars 2020 mission and to further development of a Mars Sample Return mission to be launched in 2026. Given that sample return was the highest priority of the previous planetary science decadal survey, NASA shall provide the Committee with a year-by-year future funding profile for a planned focused Mars sample return mission to be ready for a 2026 launch. In addition, the Committee endorses the mid-term decadal survey recommendation for NASA to develop a comprehensive Mars program architecture, strategic

plan, and management structure that maximizes synergy among existing and future domestic and international missions and science optimization at the architectural level.

Jupiter Europa Missions.—The Committee provides \$592,600,000, which is \$47,600,000 greater than fiscal year 2019, and equal to the requested level, for the Europa Clipper Mission. The Clipper mission will explore Europa, the smallest of the four Galilean moons orbiting Jupiter, and investigate its habitability.

Jupiter Europa Lander.—The Committee provides no additional funding for the Jupiter Europa Lander. In fiscal year 2019, the Committee provided \$195,000,000 for the Jupiter Europa Lander. Development of the Jupiter Europa Lander is a priority and the Committee wishes to see research and development of the Lander continue. The Committee understands that funding provided in fiscal year 2019 is sufficient to continue research and development through fiscal year 2020. Therefore, additional funding is not provided for Lander in this Act. However, the Committee directs NASA to include adequate funding for continued research and development of the Jupiter Europa Lander in the fiscal year 2021 budget request.

Icy Satellites Surface Technology.—The Committee provides \$60,000,000, which is \$25,000,000 greater than fiscal year 2019, and \$57,800,000 greater than the requested level, for Icy Satellites Surface Technology to meet the science goals for the Jupiter Europa mission as recommended in previous Planetary Science Decadal surveys and to enable a lander on Europa by the next decade, based on input from the next Planetary Science Decadal survey.

Stratospheric Observatory for Infrared Astronomy (SOFIA).—Within Astrophysics, the Committee provides \$85,200,000, which is equal to fiscal year 2019, and \$12,200,000 greater than the requested level, for the Stratospheric Observatory for Infrared Astronomy (SOFIA). Working collectively with other space telescopes, including Hubble and Spitzer, these observatories create a comprehensive web of information and data that spans both the electromagnetic spectrum and time itself.

Wide Field Infrared Survey Telescope (WFIRST).—The Committee provides \$510,700,000, which is \$198,500,000 greater than fiscal year 2019, and \$510,700,000 greater than the Administration's requested level, which would have eliminated WFIRST. This mission was included as the highest priority in the 2010 Astrophysics Decadal Survey. The recommended amount shall include \$65,000,000 for continued development of the coronagraph as a technology demonstration mission. The WFIRST telescope continuation is essential to unravel the secrets of dark energy and dark matter, search for and image exoplanets, and explore many topics in infrared astrophysics.

Heliophysics.—The Committee provides \$704,500,000, which is \$15,500,000 below fiscal year 2019, and equal to the Administration's requested level for Heliophysics. Heliophysics studies the nature of the Sun and how it influences the very nature of space. Studying this system helps us understand fundamental information about how the universe works and helps protect technology and astronauts in space.

AERONAUTICS

The Committee provides \$700,000,000 for Aeronautics, which is \$25,000,000 below fiscal year 2019 and \$33,100,000 above the Administration's requested level.

Hypersonics Technology Project.—Within amounts provided, no less than \$60,000,000 is for NASA's ongoing Hypersonics Technology Project. This project coordinates closely with partners in the Department of Defense so that NASA can leverage their investments in ground and flight activities to develop and validate advanced physics-based computational models as building blocks towards the long-term vision. Focus areas for the project include hypersonic propulsion systems, reusable vehicle technologies, high-temperature materials, and systems analysis. The development of new hypersonic capabilities, generally faster than mach five, focuses on sustaining hypersonic competency for national needs while advancing fundamental hypersonics research.

Electric Air Flight.—The Committee encourages strengthening collaborations between NASA, the Department of Energy, and national laboratories to overcome energy storage challenges for mobility such as electric air flight. Additionally, the Committee encourages efforts to overcome technological barriers in demonstrating the capability of electrified aircraft, such as higher energy density batteries, development of new, lower-cost materials, and the establishment of testing methods and protocols.

SPACE TECHNOLOGY

The Committee recommends \$1,291,600,000 for Space Technology, which is \$364,700,000 above fiscal year 2019, and \$277,300,000 above the Administration's requested level.

Space Technology Mission Directorate.—The Committee reaffirms its support for the independence of the Space Technology Mission Directorate and recognizes that its current status enables it to support the development of a wide array of various technologies. This diverse portfolio contains technology development activities that have broad applications beyond human exploration and that help to meet the agency's science objectives, establish new commercial and academic partnerships, and stimulate the growth of the nation's technology sector. This approach also ensures that NASA technologists and their external partners maintain the ability to address long-term strategic goals rather than only focusing on short-term, mission-specific objectives. In addition, the Directorate's direct engagement with the academic community is supporting the development of the next generation of space technologists. The Committee directs NASA to preserve the Directorate as a standalone entity within the agency, and to maintain its focus on broad technology development goals that are independent of mission-specific needs.

Regional economic development.—The Committee provides \$8,000,000, which is \$3,000,000 above fiscal year 2019, and \$8,000,000 above the Administration's requested level for NASA's regional economic development program that focuses on partnerships with State and regional economic development organizations as they expand space-related commercial opportunities designed to address NASA mission needs.

Nuclear thermal propulsion technology.—The Committee provides \$125,000,000, which is \$25,000,000 greater than the fiscal year 2019 enacted amount, and \$125,000,000 greater than the Administration's requested level, which was zero, for continued development and demonstration of a nuclear thermal propulsion system. Within 180 days of the enactment of this Act, NASA shall submit a multi-year plan that enables a nuclear thermal propulsion demonstration, including the timeline associated with the space demonstration, and a description of future missions and propulsion and power systems enabled by this capability. NASA shall take into consideration the use of nuclear thermal propulsion as it drafts the multi-year exploration roadmap directed in this bill. Further, within the amounts provided for nuclear thermal propulsion, up to \$10,000,000 may be used to develop a digital twin model to support the cost-effective development, manufacturing, and operation of nuclear thermal propulsion technologies.

Technology Maturation—In-Space Robotic Manufacturing and Assembly.—The Committee provides \$72,200,000, which is \$37,200,000 greater than fiscal year 2019, and equal to the Administration's requested level, for In-Space Robotic Manufacturing and Assembly. Within this appropriation is \$14,300,000 for additive manufacturing, a process that will transform the traditional spacecraft-manufacturing model by enabling in-space creation of large spacecraft systems. No longer will developing, building, and qualifying a spacecraft focus so heavily on an integrated system that must survive launch loads and environments. These crosscutting technologies could also greatly reduce cost while increasing capabilities for both NASA and commercial space applications. Across all NASA accounts, funding is included for In-Space Robotic Manufacturing, of which nearly \$35,000,000 is included for additive manufacturing. Further, the Committee supports additive manufacturing efforts focused on sub-scale work, including the development of digital twin technologies.

Technology Demonstration Mission—Satellite Servicing/Restore-L.—The Committee provides \$180,000,000, which is equal to the fiscal year 2019 appropriated level and \$134,700,000 greater than the Administration's fiscal year 2020 requested level, for the Restore-L program to conduct an orbital refueling mission in 2022. These funds shall be used exclusively for activities related to and associated with the Restore-L spacecraft and any demonstrations that it will conduct or support. The Committee recognizes and encourages the development of satellite servicing to benefit not only NASA, but the Department of Defense, the Intelligence Community, and the private sector. Moreover, the Committee directs NASA to encourage other government entities to take full advantage of Restore-L's capabilities.

Solar Electric Propulsion.—The Committee provides \$48,100,000, which is equal to the fiscal year 2019 appropriated level, and \$4,700,000 greater than the Administration's fiscal year 2020 requested level, for solar electric propulsion activities. According to NASA, high-powered solar electric propulsion can efficiently propel more ambitious robotic science and human exploration missions beyond the Earth and into deep space. Furthermore, solar electric propulsion will enable more efficient orbit transfer of spacecraft

and accommodate the increasing power demands for government and commercial satellites.

Flight opportunities small launch technology platform.—Within amounts provided, no less than \$25,000,000 is for the Flight Opportunities Program to enable NASA to continue to partner with commercial industry to advance technologies for sub-orbital and orbital launch vehicles for small payloads, with the aim to increase affordability of those technologies and to allow for more frequent access to relevant launch environments, including low-Earth orbit. This funding fills a research gap by offering several minutes of micro-gravity research at a relatively low price. Of this amount, \$5,000,000 is dedicated for competitively-selected opportunities in support of payload development and flight of K–12 and collegiate educational payloads.

Advanced Technologies to Support Air Revitalization Initiative.—The Committee provides \$3,500,000, equal to the fiscal year 2020 request level, for NASA to support university and industry research related to the development and application of ionic liquid-based technologies to aid in air revitalization systems.

EXPLORATION

The Committee provides \$5,129,900,000 for Exploration, which is \$79,100,000 above fiscal year 2019, and \$108,200,000 above the Administration's requested level.

Orion.—The Committee provides \$1,425,000,000, which is \$75,000,000 above the fiscal year 2019 appropriated level, and \$158,800,000 greater than the Administration's fiscal year 2020 requested level for Orion. NASA shall keep the Committee informed of the status of activities related to Orion, the European Service Module, and ongoing activities related to integration of Orion with Space Launch System and associated ground infrastructure.

Space Launch System (SLS).—The Committee provides \$2,150,000,000, which is equal to the fiscal year 2019 appropriated level, and \$374,600,000 greater than the Administration's fiscal year 2020 requested level for SLS.

Exploration Ground Systems (EGS).—The Committee provides \$592,800,000, which is equal to the fiscal year 2019 appropriated level, and \$192,700,000 greater than the Administration's fiscal year 2020 requested level for Exploration Ground Systems (EGS). Within this amount, \$50,000,000 is included for the second mobile launch platform.

Exploration missions.—In its 2014 report, *Actions Needed to Improve Transparency and Assess Long-Term Affordability of Human Exploration Programs*, the U.S. Government Accountability Office (GAO) recommended that NASA establish a separate cost and schedule baseline for work required to support Space Launch System (SLS) Block I Exploration Mission-2 and establish separate cost and schedule baselines for each additional capability of SLS, Orion, and associated exploration ground systems that encompass all life-cycle costs, to include operations and sustainment. The NASA Office of Inspector General made a similar recommendation in its April 2017 report, *NASA's Plans for Human Exploration Beyond Low Earth Orbit*, noting that NASA should establish more rigorous cost and schedule estimates for the SLS and exploration ground programs for the EM-2 mission mapped to available re-

sources and future budget assumptions. Accordingly, NASA shall, within one year of enactment of this Act, establish the agency cost and schedule commitments for the launch readiness date for SLS and the associated ground systems for EM-2. If additional development efforts occur outside the scope of work for EM-2—such as, but not limited to, Exploration Upper Stage and a second Mobile Launcher—then NASA shall establish separate cost and schedule baselines for each additional capability of SLS, Orion, and associated ground systems that exceed the \$250,000,000 threshold for designation as a major project and ensure they encompass all life-cycle costs, to include operations and sustainment.

Human exploration programs.—The Committee directs GAO to continue its review of NASA’s human exploration programs, specifically the SLS program, the Orion program, and Exploration Ground Systems, to include the mobile launch platforms, and to include integration and software development issues that cut across these programs. In addition, the Committee directs GAO to review NASA’s lunar-focused programs, including the Gateway program and other programs or projects that are expected to have an estimated life-cycle cost over \$250,000,000, as part of GAO’s semi-annual assessment of NASA major projects. Separately, the Committee directs GAO to continue conducting in-depth reviews of NASA’s lunar-focused programs. GAO shall report on the acquisition progress of these programs, as well as any challenges NASA faces in implementing its lunar efforts, as applicable. GAO shall provide periodic updates to the Committee on these reviews.

Monitoring Program Costs and Execution.—The Committee recommends that NASA adhere to the open priority recommendations provided by GAO. These nine priority recommendations relate to: (1) monitoring program costs and execution, and (2) improving efficiency and effectiveness. One recommendation regarding the International Space Station will be addressed in separate report language related to Space Operations. Further, within 90 days after enactment of this Act, NASA is directed to report to the Committee on its efforts to implement the priority GAO recommendations, and, if necessary, provide the Committee with adequate justification as to why NASA has failed, or will not comply.

Recommendations for monitoring and execution not mentioned elsewhere in this report include: to decrease the risk of cost and schedule overruns, NASA should identify a range of possible missions for each future SLS variant that includes cost and schedule estimates and plans for how those possible missions would fit within NASA’s funding profile; to decrease the risk of cost and schedule overruns and to promote affordability, before finalizing acquisition plans for future capability variants, NASA should assess the full range of competition opportunities and assess the extent to which development and production of future elements of the SLS could be competitively procured; to improve NASA management and oversight of its spaceflight projects, and to improve the reliability of project earned value management (EVM) data, NASA should modify the NASA Procedural Requirements 7120.5 to require projects to implement a formal surveillance program that: (1) Ensures anomalies in contractor-delivered and in-house monthly EVM reports are identified and explained, and report periodically to the center and mission directorate’s leadership on relevant trends in

the number of unexplained anomalies; (2) Ensures consistent use of work breakdown structures (WBSs) for both the EVM report and the schedule; (3) Ensures that lower-level EVM data reconcile with project-level EVM data using the same WBS; (4) Improves underlying schedules so that they are properly sequenced using predecessor and successor dependencies and are free of constraints to the extent practicable so that the EVM baseline is reliable; and (5) to provide reliable estimates of program cost and schedule that are useful to support management and stakeholder decisions, NASA should direct the Orion program to perform an updated Joint Cost and Schedule Confidence Level analysis in adherence with cost and schedule estimating best practices.

Recommendations for improving efficiency and effectiveness include: NASA should coordinate with the Office of Science and Technology Policy's Research Business Models working group to identify additional areas where they can standardize administrative research requirements.

NASA shall report to the Committee on all these efforts no later than 180 days after the enactment of this Act.

SPACE OPERATIONS

The Committee provides \$4,285,700,000 for Space Operations, which is \$353,400,000 below fiscal year 2019 and equal to the requested level.

International Space Station (ISS).—The Committee recommends that NASA adhere to the open priority recommendation provided by the GAO to develop and maintain a contingency plan for ensuring a presence on the ISS until a Commercial Crew Program contractor is certified.

Public-Private Partnerships.—The Committee supports public-private partnerships to advance commercial capabilities in LEO, particularly those involving in-kind contributions by NASA, such as providing a docking node on the ISS available for partnership opportunities.

Female Astronaut Equipment.—The Committee is concerned by reports that a lack of adequate equipment prevented two female astronauts from completing an historic spacewalk together aboard the International Space Station. The Committee directs NASA to work with International Space Station partners to ensure that adequate equipment is available in the future, and to determine if additional resources are required to meet such a request. Therefore, within 90 days after enactment of this Act, NASA shall report to the Committee on the resources necessary to make adequate equipment available, the timelines required to make such adequate equipment available, and plans for providing adequate equipment in the future.

21st Century Launch Complex Program.—Within the amounts provided for Space Operations, the recommendation includes up to the fiscal year 2019 levels for the 21st Century Launch Complex Program. The Committee remains concerned with regard to efforts directed toward filling critical maintenance, capacity, and range safety gaps at NASA launch facilities. The Committee directs that within 90 days after enactment of this Act, NASA shall report to the Committee regarding the critical maintenance requirements, capacity, range safety gaps backlog, and associated costs at all

NASA-owned launch complexes, criteria for awarding funds, and plans for future funding requests for this critical space infrastructure program.

Commercial Crew Program.—The Commercial Crew Program is critical to ensuring the United States has safe and reliable domestic human spaceflight access to low Earth orbit. The Committee supports the efforts of NASA and its industry partners to begin operational missions transporting NASA and international partner astronauts. To ensure continued innovation in safety systems and to appropriately support ongoing test activities, the Committee supports the requested level for the Commercial Crew Program. Further, not later than 30 days after the enactment of this Act, NASA is directed to provide a report discussing differing launch vehicle fueling methods being employed by Commercial Crew Partners and the relative impact of those approaches on the overall mission and crew safety.

Rocket Propulsion Test program.—The Committee commends the work of the NASA Rocket Propulsion Test Program in developing and testing rocket propulsion systems under controlled conditions, which is critical for the success of NASA and commercial missions. Within the amounts provided for Space Operations, the recommendation provides that up to the fiscal year 2019 level may be used for NASA's Rocket Propulsion Test program.

International collaboration.—The Committee supports joint projects between NASA and the Israel Space Agency and directs a report from NASA within 180 days of enactment of this Act detailing current and planned projects between the two agencies.

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) ENGAGEMENT

The Committee provides \$123,000,000 for Science, Technology, Engineering, and Mathematics (STEM) Engagement, which is \$13,000,000 greater than fiscal year 2019. The Administration requested no funding for STEM. The Committee expects NASA to continue implementing the programs below and to ensure that overhead costs to support these programs do not exceed five percent. Further, the Committee directs NASA to include an adequately requested funding amount for STEM in the fiscal year 2021 budget request and future requests.

National Space Grant College and Fellowship Program.—The recommendation includes \$48,000,000 for the Space Grant program. This amount shall be allocated to State consortia for competitively awarded grants in support of local, regional, and national STEM needs.

Established Program to Stimulate Competitive Research (EPSCoR).—The recommendation includes \$25,000,000 for EPSCoR.

Minority University Research and Education Project (MUREP).—The recommendation includes \$37,000,000 for MUREP.

STEM Education and Accountability Projects (SEAP).—The recommendation includes \$13,000,000 for SEAP.

SAFETY, SECURITY AND MISSION SERVICES

The Committee provides \$3,084,600,000 for Safety, Security and Mission Services, which is \$329,600,000 above fiscal year 2019 and equal to the requested level.

Working Capital Fund (WCF) reporting.—NASA shall continue to submit quarterly reports to the Committee on the expenditures and unobligated balances of NASA's WCF.

Wind Tunnels.—The Committee recommendation approves NASA's proposal to transfer the management and funding for its wind tunnels and other aeronautics ground testing assets and facilities to Safety, Security, and Mission Services. This transfer is intended to improve the overall efficiency and effectiveness of managing testing capabilities within the Agency.

CONSTRUCTION AND ENVIRONMENTAL COMPLIANCE AND RESTORATION

The Committee provides \$497,200,000 for Construction and Environmental Compliance and Restoration, which is \$149,000,000 above fiscal year 2019 and \$103,200,000 below the requested level.

Construction.—The recommendation includes \$414,300,000 for Construction of Facilities, minor revitalization, planning and design, and demolition. Included in this amount is no less than \$130,500,000 for NASA's three highest priority construction projects.

Environmental Compliance and Restoration.—The recommendation includes \$82,900,000, which is \$8,000,000 greater than the fiscal year 2019 appropriated level and equal to the Administration's fiscal year 2020 requested level, for Environmental Compliance and Restoration activities. NASA's Environmental Compliance and Restoration (ECR) program cleans up hazardous materials and waste products released to the surface or groundwater at NASA installations, NASA-owned industrial plants supporting NASA activities, current or former sites where NASA operations have contributed to environmental problems, and other sites where the Agency is legally obligated to address hazardous pollutants. Included in this amount is requested funding to manage costs while remediating environmental contaminants at the Santa Susana Field Laboratory.

OFFICE OF THE INSPECTOR GENERAL

The Committee recommends \$41,700,000 for the Office of the Inspector General, which is \$2,400,000 above fiscal year 2019 and equal to the requested level.

ADMINISTRATIVE PROVISIONS

(INCLUDING TRANSFERS OF FUNDS)

The Committee has included the following administrative provisions for NASA:

The bill includes a provision that makes funds for any announced prize available without fiscal year limitation until the prize is claimed or the offer is withdrawn.

The bill includes a provision that establishes terms and conditions for the transfer of funds.

The bill includes a provision that requires NASA to submit its agency spending plan at the activity level and subjects both the spending plan and specified changes to that plan to reprogramming procedures under section 505 of this Act.

NATIONAL SCIENCE FOUNDATION

The Committee recommends \$8,636,141,000 for the National Science Foundation (NSF). This significant investment, which is \$561,141,000 above fiscal year 2019 and \$1,570,141,000 above the request shows the Committee's support for science, the academic community, and the next generation of scientists, mathematicians, astronomers, and engineers across the country. The Committee underscores the importance of basic research that both improves the lives of Americans and expands our understanding of the Earth, the depths of our oceans, our Solar System, the Universe, and oceans on other planets.

The Committee supports infrastructure investments that expand our understanding of the universe and inspire students to pursue careers in the sciences. The Committee recognizes that current and future large scientific facilities represent an enormous investment of Federal resources that must be administered wisely. The Committee supports basic research in fundamental science areas and expects that as NSF uses the 10 Big Ideas as a focusing tool, the funding for the fundamental scientific disciplines will be maintained. Within amounts provided, NSF shall allocate no less than fiscal year 2019 levels to support its existing scientific research, research laboratories, observational networks, and other research infrastructure assets, including the astronomy assets, the current academic research fleet, Federally funded research and development centers, and the national high-performance computing centers, so that they may provide the support needed for cutting edge research.

Innovation Corps.—The Committee recognizes the value of translating basic research for public benefit and the recommendation includes an increase of \$5,000,000 above the fiscal year 2019 level for the Innovation Corps program to build on the initial successes of its highly innovative public-private partnership model and expand the program to additional academic institutions.

Computer Science for All.—The Committee strongly supports NSF's Computer Science for All efforts and the recommendation including an increase of not less \$10,000,000 above the fiscal year 2019 level for such activities. The Computer and Information Science and Engineering directorate is expected to collaborate with the Division of Research on Learning in Formal and Informal Settings to build on ongoing efforts to improve rigorous computer science education.

RESEARCH AND RELATED ACTIVITIES

The Committee recommends \$7,106,301,000 for Research and Related Activities, which is \$586,301,000 above fiscal year 2019 and \$1,443,341,000 above the request. The Committee believes that strategic investments in the physical sciences are vitally important for the United States to remain the global leader in innovation, productivity, economic growth, and high-paying jobs for the future.