

SCIENCE

The bill provides \$4,503,019,000 for science, an increase of \$61,500,000 over the budget request. The amount provided reflects an unallocated adjustment of \$70,898,000 and reflects unobligated balances carried into fiscal year 2009 from fiscal year 2008. NASA shall within 30 days of enactment of this Act provide to the House and Senate Committees on Appropriations its proposed distribution of the unallocated adjustment. In doing so, NASA shall identify offsets that do not result in delays or cancellations of missions in development or the cancellation of any selected projects, and shall not identify as offsets any increases provided above the request expressly provided by Congress.

Earth science.—NASA's Earth science portfolio shall have a continuous mixture of small-, medium-, and observatory class Earth science missions that guarantee regular and recurring flight opportunities for the Earth science communities.

Earth decadal survey missions.—A total of \$150,000,000 is provided for Earth decadal survey missions. Funds are provided to support on-going activities of the ICESat II and SMAP missions. In addition, funds are provided to accelerate and achieve a level of system development more consistent with the National Academy of Sciences' recommendations. The bill provides funds to accelerate the ICESat II mission so that it will be ready to launch in 2013 concurrently with the SMAP mission, consistent with the National Academy of Sciences' recommendations.

Landsat data continuity mission (LDCM).—Funding of \$10,000,000 is provided to initiate development of a thermal infra-red sensor (TSIS). NASA is directed to identify the earliest and least expensive development approach and flight opportunity for TSIS. NASA shall report its findings to the House and Senate Committees on Appropriations not later than March 2, 2009.

NASA is further directed to develop, in cooperation with the Office of Science and Technology Policy (OSTP) and the U.S. Geological Survey (USGS), a plan for a follow-on mission to LDCM consistent with the recommendations of the National Science and Technology Council's report, A Plan for A U.S. National Land Imaging Program. This plan is due to the House and Senate Committees on Appropriations no later than August 31, 2009.

Earth science applications program.—The bill provides \$10,000,000 over the budget request for Earth science applications under the Research Opportunities in Space and Earth Sciences (ROSES) program, which shall be available to support new competitively-selected projects under subsection A.28, Earth Science For Decision Making: Gulf of Mexico Region, to be selected during fiscal year 2009.

Deep Space Climate Observatory (DSCOVR). The bill provides \$9,000,000 for NASA to refurbish and ensure flight and operational readiness of DSCOVR earth science instruments.

Servicing Opportunities for Science Missions. Recognizing the historic successes NASA has achieved through the servicing of the Hubble Space Telescope, the National Research Council's recent report Launching Science: Science Opportunities Provided by NASA's Constellation System recommends that "NASA should study the benefits of designing spacecraft intended to operate around Earth or the Moon, or at the libration points for human and robotic servicing." This recommendation parallels the guidance provided by section 502 of the NASA Authorization Act of 2008 (P.L. 110-422), which recommends that provision be made for servicing of future scientific spacecraft to the

extent practicable. Therefore, it will be critical that the Constellation program demonstrate unique capabilities to maintain synergies between free-flying scientific spacecraft and human spaceflight endeavors. Accordingly, the bill provides \$20,000,000 for NASA to undertake an assessment of the feasibility of using the Constellation architecture to service existing and future observatory-class scientific spacecraft, fully utilizing the unique, core expertise and competencies for in-space servicing developed by the Goddard Space Flight Center and its private sector partners for the Hubble Space Telescope. NASA shall provide to the House and Senate Committees on Appropriations a plan for expenditure of this funding no later than 30 days after enactment of this Act.

Lunar landers.—The bill provides, as requested, \$10,000,000 for the selected lunar lander.

Mars exploration.—NASA shall continue to engage the Mars community to define missions for the next decade that will lead to a Mars sample return in the 2020s. NASA is encouraged to define a budget profile for the Mars exploration program to support a lander mission and follow-on missions through 2020; consider augmenting technology to be demonstrated as part of the 2013 Scout; and support the small, competitively-selected missions such as Mars Scouts.

Mars science laboratory (MSL).—The bill provides the budget request of \$223,331,000 for MSL. Over the past several months, NASA, with the concurrence of the House and Senate Committees on Appropriations, has taken reprogramming actions to address continuing project cost increases and to maintain a launch schedule in 2009; however, slower-than-expected progress, combined with late completion and deliveries of hardware, has contributed to deterioration in schedule performance. As a result, NASA has informed the House and Senate Committees on Appropriations on December 4, 2008, of its decision to delay a 2009 launch. The relative orbital location of Mars and Earth dictates that the next launch opportunity is 2011. However, in order to support a 2011 launch, NASA will need to identify additional resources in the range of \$400,000,000. NASA is directed to provide to the House and Senate Committees on Appropriations not later than February 2, 2009, the impact on the project's baseline development cost estimate consistent with reporting requirements of section 103 of the NASA Authorization Act of 2005 (Public Law 109-155); and proposed resource allocations necessary to meet a 2011 launch. A reallocation of this magnitude can be expected to have significant impacts on other projects, and accordingly, NASA is directed to consult with the space science community to ensure its views are taken into consideration in any decision regarding future funding for MSL.

Outer planets.—NASA plans to conduct an outer planet flagship mission in cooperation with the European community, which a launch as soon as practicable. A more detailed plan and projected launch date shall be part of the fiscal year 2010 budget. The bill includes \$101,089,000 for the outer planets program, as requested.

Hubble Space Telescope.—The bill provides the full requirement of \$207,697,000 for the operations and upcoming servicing of the Hubble Space Telescope.

Astrophysics exoplanet exploration, other missions and data analysis.—An increase of \$20,000,000 is provided to continue NASA's efforts in assessing lower cost versions of the Space Interferometry Mission (SIM) and in completing the detailed formulation phase of a "SIM-Lite" mission that would meet the requirements laid out in the most recent decadal surveys for an astrophysics mission.

Radiation Belt Storm Probes.—The bill provides the full budget request of \$154,442,000 to continue this mission for launch in 2012.

Solar Probe.—The bill includes \$18,000,000 for the Solar Probe mission, the highest priority recommendation of the National Academies' heliophysics decadal report. NASA is directed to work to achieve a launch no later than 2015.

Magnetospheric Multiscale Mission.—The bill includes the budget request of \$94,582,000 for the Magnetospheric Multiscale Mission. NASA is directed to undertake no action to de-scope or reduce the project's scientific instruments or capacity.

Wallops Flight Facility (WFF).—The WFF is an important national asset that can be better utilized by focusing on emerging technologies that meet national needs and NASA priorities. The bill therefore provides programmatic increases of: \$5,000,000 for advanced technology development of small satellites and unmanned aerial systems (UAS) that have the potential of lowering the costs of space and Earth science missions consistent with the goals of venture class missions recommended by the National Academies' Earth science decadal report; and \$14,000,000 to improve launch pad infrastructure. NASA is directed to prepare a five-year action plan, including a proposed funding forecast, that identifies specific program and advanced technology development work that will utilize and expand the Wallops Flight Facility's role in the development of small satellites and unmanned aerial systems to meet critical earth science and other space system needs. This plan is due to the House and Senate Committees on Appropriations by June 1, 2009.

Ocean vector wind study.—NASA, working with NOAA and within the funds provided, shall study satellite and non-satellite alternatives for generating SeaWinds-like ocean wind data.

AERONAUTICS

The bill provides \$500,000,000 for aeronautics research. The research and development activities undertaken with the augmentation shall not be based on the determination that the investment in an activity would result in a useable or useful product based only on one year's funding. Accordingly, the Aeronautics Research Mission Directorate is directed to provide to the Committees on Appropriations of the House and Senate in NASA's initial fiscal year 2009 operating plan a proposed expenditure analysis of the congressional augmentation to ensure that this investment of funds is devoted to long-term, multi-year research and development activities to support NextGen technology needs and solutions and "green" aircraft.

EXPLORATION

The bill provides \$3,505,469,000 for exploration for fiscal year 2009, \$5,000,000 over the budget request. The amount provided includes an unallocated adjustment of \$18,000,000. NASA shall within 30 days of enactment of this Act provide to the House and Senate Committees on Appropriations its proposed distribution of the unallocated adjustment. In doing so, NASA shall identify offsets that do not result in delays or cancellations of missions in development or the cancellation of any selected projects, and shall not identify as offsets any increases provided above the request expressly provided by Congress.

Constellation systems.—The bill includes the budget request of \$1,018,515,000 for Ares and \$1,101,436,000 for Orion.

Constellation systems program, heavy lift cargo vehicle.—The bill includes \$23,000,000 above the request for Ares V design requirements definition and research and development for a systems requirement review.