



SPACE EXPLORATION, SCIENCE, AND AERONAUTICS *Research and Development Funding in the President's 2008 Budget*

Three years ago, the President outlined a bold Vision for sustained and affordable human and robotic exploration of space, with the Moon as a first step toward human missions to Mars and other destinations. Over this past year, NASA has continued to redirect its existing human spaceflight programs – the Space Shuttle and International Space Station (ISS) – toward the goal of supporting the Vision, while successfully returning the Shuttle to flight and resuming the assembly of the ISS. Further, NASA has made significant progress in defining the launch and spacecraft architecture requirements necessary to implement the Vision, and also has begun to develop goals and plans for potential activities on the lunar surface. In support of this planning effort, NASA has undertaken discussions with other countries on an over-arching, international lunar exploration strategy, as well as areas for international cooperation in relation to the Vision. In addition, an exciting array of science missions is being planned that will enhance our understanding of the solar system, the Earth's environment and its complex interactions with the Sun, and the origin, structure, evolution and destiny of the universe. Lastly, NASA has restructured its aeronautics program to focus on long-term research of broad benefit to the Nation, consistent with the new National Aeronautics R&D Policy.

The President's 2008 Budget for NASA is \$17.3 billion, a 3.1% increase over the President's 2007 request, reflecting a strong commitment by the Administration to continued pursuit of the Exploration Vision. Out of necessity, the 2008 NASA budget also makes some difficult decisions, canceling some projects with high technical risk and/or whose cost would have led to the certain delay or cancellation of other important programs. The budget request advances NASA's progress towards the Vision while continuing robust programs in science and aeronautics.

Progress on the Exploration Vision – NASA requests \$3.92 billion in 2008 for new vehicles and technologies to enable sustained human and advanced robotic exploration far from Earth. NASA has identified the major design features and requirements for two key elements: the Orion Crew Exploration Vehicle (CEV) and the Ares I launch vehicle that will carry astronauts to the Moon. Having already initiated the acquisition process for certain elements of this architecture during 2006, NASA anticipates that all Orion CEV and Ares I elements will be under contract by the end of 2007, with the first crewed-flight planned to occur no later than 2014. In parallel, NASA plans to launch a series of lunar robotic missions starting in 2008 that will help acquire information to support future human missions as well as scientific study of the Moon. NASA will continue pursuing critical new technologies to support exploration, such as advanced thermal protection and propulsion for the Orion CEV, as well as other technologies necessary for human lunar missions. In addition, NASA is pursuing creative means to engage private industry, including offering space prizes to spur innovation and procuring commercial launch services to support the ISS through the Commercial Orbital Transportation Services program.

Advancing Earth and Space Science – The FY2008 Budget requests \$5.52 billion, almost a third of NASA's total budget, to continue operating the 59 spacecraft of NASA's Science Mission Directorate and to support investments in future Earth and space science missions, vital technologies, and frontier research. NASA will develop seven new Earth observing space missions, including the Landsat Data Continuity Mission and the Global Precipitation Measurement mission, which will launch no later than 2013. NASA will continue its roles in the interagency Climate Change Science Program and the international initiative on the Global Earth Observing System of Systems. NASA will also support studies of the Earth-Sun system using data from the STEREO mission and the upcoming Solar Dynamics Observatory. A new Lunar Science Research program will leverage robotic investigations of the lunar surface in support of the Vision for Space Exploration. Following up its missions to Mars and Saturn, NASA is sending ever-more capable spacecraft to Mars, Mercury, the asteroids, and Pluto. NASA also will continue its vibrant astronomy program through its Great Observatories, and will upgrade Hubble in 2008 to provide five more years of productive on-orbit life, while planning new spacecraft, such as Webb and Kepler, that will search for planets around other stars and peer deep into the universe. Funding for the Beyond Einstein program is increased in FY 2008 to act on the forthcoming recommendation from the National Research Council regarding a strategy to unlock the secrets of the fundamental physics of the universe.

Assembling and Utilizing the ISS – The 2008 NASA budget proposes \$6.79 billion for operating the Space Shuttle and continuing assembly and operations of the ISS. NASA is configuring the ISS consistent with the President's Vision and the needs of our international partners, while employing the minimum number of Shuttle flights required to complete assembly of the ISS before Shuttle retirement in 2010. NASA successfully conducted three Space Shuttle flights in 2006, including the second of two planned test flights in support of the return-to-flight effort and two ISS assembly flights. NASA is refocusing U.S. research on the ISS to prepare human explorers to travel beyond low Earth orbit, including developing countermeasures against space radiation and understanding long-term physiological effects of reduced gravity.

New Aeronautics Policy. – In December 2006, the President approved the nation's first National Aeronautics R&D Policy. Consistent with this Policy, the 2008 NASA aeronautics budget prioritizes fundamental aeronautics research, the improvement of aviation safety, and research that will help support the development of the Next Generation Air Transportation System. In addition, NASA will address infrastructure upgrades and maintenance requirements for aeronautical test facilities across NASA centers that are of vital importance to the Nation. The 2008 Budget requests \$554 million for NASA aeronautics, an almost 5 percent increase over the 2007 request after adjusting for NASA's implementation of simplified full-cost accounting.