Order Code RS22063
Updated November 17, 2005

The National Aeronautics and Space Administration: Overview, FY2006 Budget in Brief, and Key Issues for Congress

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Summary

The National Aeronautics and Space Administration (NASA) conducts U.S. civilian space activities. For FY2006, NASA requested $16,456.3 million, a 2.4%increase over the $16,070.4 million it received in the FY2005 Consolidated Appropriations Act (P.L. 108-447), or 1.6% more than the total of $16,196.4 million it received for FY2005, including a hurricane supplemental. The final version of the FY2006 appropriations bill that includes NASA (H.R. 2862) approves $16,456.8 million ($500,000 above the request); it is awaiting signature by the President. A NASA authorization bill (H.R. 3070) passed the House with a $510 million increase above the request; the Senate-passed version (S. 1281) has a $100 million increase. The Administration included $324.8 million for NASA in the October 28, 2005 reallocation package that includes funds for hurricane relief. This report is updated regularly.

Agency Overview

The National Aeronautics and Space Administration (NASA) was created by the 1958 National Aeronautics and Space Act (P.L. 85-568). NASA conducts civilian space and aeronautics activities. NASA opened its doors on October 1, 1958, almost exactly one year after the Soviet Union ushered in the Space Age with the launch of the world's first satellite, Sputnik, on October 4, 1957. In the more than 47 years since, NASA has conducted far reaching programs in human and robotic spaceflight, technology development, and scientific research.

Dr. Michael Griffin is the Administrator of NASA. The agency is managed from NASA Headquarters in Washington, D.C. Links to NASA's four Mission Directorates (Aeronautics Research, Exploration Systems, Science, and Space Operations) and individual NASA programs, are at [http://www.hq.nasa.gov/hq/org.html]. NASA has nine major field centers: **Ames Research Center**, Moffett Field, CA; **Dryden Flight Research Center**, Edwards, CA; **Glenn Research Center**, Cleveland, OH; **Goddard Space Flight Center**, Greenbelt, MD; **Johnson Space Center**, near Houston, TX; **Kennedy Space Center**, near Cape Canaveral, FL: **Langley Research Center**, Hampton,

VA; **Marshall Space Flight Center**, Huntsville, AL; and **Stennis Space Center**, in Mississippi, near Slidell, LA. The **Jet Propulsion Laboratory**, Pasadena, CA, is a Federally Funded Research and Development Center operated for NASA by the California Institute of Technology. According to NASA, the agency has approximately 19,000 civil servant full time equivalents (FTEs) budgeted for FY2005.

NASA's FY2006 Budget Request

NASA requested $16,456.3 million, a 2.4% increase over the $16,070.4 million appropriated in the FY2005 Consolidated Appropriations Act (adjusted for the rescission). NASA also received $126 million in a FY2005 supplemental for hurricane relief, giving it a total of $16,196.4 million for FY2005. The FY2006 request is 1.6% more than that total. Last year, NASA was projected to receive a 4.7% increase for FY2006. NASA has substantially changed its budget structure again, as explained in footnotes to **Table 1**. NASA submitted a budget amendment on July 15; the total amount requested for the agency did not change, only how it is allocated within the agency. The "FY2006 Req" figures in Table 1 reflect the amendment, but the appropriations figures do not.

Table 1. NASA's FY2006 Budget Request

(Budget Authority, in millions of dollars)

Category	FY2005 Est.*	FY2006 Req. (Amended)	House App.	Senate App.	Conf. Rpt.	Senate Auth.	House Auth.
Science, Aero., and Expl.	****7,681**	****9,829**	**9,726**	**9,761**	**9,761**	**9,661**	
Science [a]	5,527	5,341				5,341	
Aeronautics	906	852					
Biological and Physical Research	1,004	— [b]					
Exploration Systems	25	3,468					
Education	217	167					
Exploration Capabilities	****8,358**	****6,595**	**6,713**	**6,603**	**6,663**	**6,863**	
Space Operations	6,704	6,595					
- Space Shuttle	*4,543*	*4,531*					
- International Space Station	*1,676*	*1,689*					
- Space and Flight Support	*485*	*376*					
Exploration Systems	1,654	— [c]					
Inspector General	**31**	**32**	**32**	**32**	**32**	**32**	
Total regular appropriations	**16,070**	**16,456**	**16,471**	**16,396**	**16,457**	**16,556**	**16,966**
Supp. for 2004 Hurricanes	**126**						
Grand total	**16,196**	**16,456**	**16,471**	**16,396**	**16,457**	**16,556**	**16,966**

Sources: Office of Management and Budget, NASA FY2006 budget request documents, and House and Senate bills and committee reports.

Note: Totals may not add due to rounding. Some of the fields are blank because the committee bills and reports do not provide requisite data.

a. In the FY2006 request, " Science" incorporates the former Space Science and Earth Science line items.
b. In the FY2006 request, Biological and Physical Research became part of Exploration Systems.
c. In the FY2006 request, funding for Exploration Systems was moved into the SA&E account.

* Figures in this column are from NASA's Initial Operating Plan (IOP) and are not final. Several operating plan updates have been submitted, but are not in a budget format compatible with the FY2006 budget.
** The FY2005 totals for the SA&E and Exploration Capabilities accounts are different from those in the table included in NASA's FY2006 budget justification documents because OMB shows the shift of "Exploration Systems" from one account to the other. The NASA table uses the FY2006 budget structure without showing that trace. Hence the OMB data are used in this report.

NASA appropriations are included in the FY2006 Science, State, Justice, Commerce appropriations bill (H.R. 2862). The House passed the bill on June 16, 2005, approving a net increase of $15 million. The Senate passed the bill on September 15, approving a net cut of $60 million. The conference report (H.Rept. 109-272), which has passed the House and Senate, approves a net increase of $500,000 ($16,456.8 million, compared with the $16,456.3 million request). Among the **increases** above the request are $280 million for congressionally directed priorities, $60 million for aeronautics, $50 million for the Hubble servicing mission, $30 million for the Glory earth science mission, $20 million for the National Center for Advanced Manufacturing, $20 million for alternative small spacecraft technology, $15 million for the Propulsion Research Lab, $15 million for earth science competitive grants, $12.2 million for the Space Grant program, $10 million for the Space Interferometry Mission, $10 million for the Institute for Scientific Research, $8.2 million for EPSCoR, $5 million for a Heavy Lift Launch Vehicle, and $5 million for the Living with a Star solar-terrestrial physics program. Among the **decreases** are $200 million from Project Prometheus; a $90 million general reduction from the Science, Aeronautics and Exploration account; $34 million from the Centennial Challenges program; $26 million from corporate G&A expenses; $25 million from exploration research and technology; $25 million from human systems research and technology; $25 million from the Discovery program; $15 million from optical communications; $80 million from the International Space Station (including $60 million from the ISS Crew/Cargo Services line); $10 million from space communications; and $10 million general reduction from the Exploration Capabilities account.

The House passed a FY2006-2007 NASA authorization bill on July 22 (H.R. 3070, H.Rept. 109-173) after adopting a manager's amendment that significantly increased funding compared with the committee-reported bill. As passed, it authorizes $16.966 billion, $510 million more than the request. (The bill uses a different budget structure than the request, so the breakdown cannot be incorporated into **Table 1**.) The Senate passed a FY2006-2010 NASA authorization bill (S. 1281, S.Rept. 109-108) on September 28 that recommends a $100 million addition to Exploration Capabilities to enhance the use of the ISS for research.

The July 15 budget amendment reflects, in part, NASA's decision to move two programs into the Exploration Systems line — ISS Crew/Cargo Services ($168 million) was moved from the International Space Station, and the Lunar Robotic Exploration Program ($135 million) was moved from the Science Mission Directorate. Other changes also were made within the accounts in the budget amendment and in updates to NASA's FY2005 operating plan (see CRS Report RL32988). Separately, two NASA facilities in

or near New Orleans, LA, were damaged by Hurricane Katrina: the Stennis Space Center, and the Michoud Assembly Facility, operated for NASA by Lockheed Martin. NASA estimates that it will cost $760 million to repair damages and relocate staff. The agency shifted $100 million in FY2005 funds to begin hurricane recovery efforts. The rescission and reallocation request submitted by the Bush Administration on October 28, 2005 contains $324.8 million for NASA for hurricane relief.

President Bush's "Vision for Space Exploration"

On January 14, 2004, President George W. Bush announced a new Vision for Space Exploration, directing NASA to focus its efforts on returning humans to the Moon by 2020, and someday sending them to Mars and "worlds beyond." The Vision involves both robotic and human space missions, and other countries were invited to participate. For more information, see CRS Report RS21720. The President proposed adding only $1 billion to NASA's five-year (FY2005-2009) budget for the Vision. The remainder of the required funding is to be redirected from other NASA activities, for example by terminating the space shuttle program in 2010, and ending U.S. use of the International Space Station in 2016. At the time of the speech, NASA issued a "sand chart" with projected NASA budgets through FY2020, but did not offer a cost estimate for the Vision. Later in 2004, NASA stated that returning humans to the Moon would cost $64 billion (2003 dollars) for FY2004-FY2020, not including robotic probes. A cost estimate for sending people to Mars was not provided. Under the Vision, NASA is to develop a new spacecraft, the Crew Exploration Vehicle (CEV), to take astronauts to and from the Moon, with an Earth-orbit capability by 2014. On September 19, 2005, NASA released its implementation plan for the Vision, setting a goal of having the CEV ready by 2012, and estimating the cost of returning humans to the Moon at $104 billion through 2018.

The President's speech came almost one year after the space shuttle *Columbia* tragedy that killed seven astronauts (see CRS Report RS21408). One of the conclusions of the chairman of the *Columbia* Accident Investigation Board (CAIB), Harold Gehman, was that the nation needs an "agreed vision" that NASA can execute. President Bush's announcement initiated the process of finding an "agreed vision." Whether or not a consensus has emerged is debatable. Supporters point to Gallup polls in 2004 and 2005 that showed strong public support, but others note that the polls were sponsored by the Coalition for Space Exploration, a group of companies and organizations that support the Vision [http://www.spacecoalition.org]. Supporters also point to congressional action funding the Vision as an endorsement. Congressional committees, however, have stressed that while they agree with the "Moon/Mars" goal, they also think NASA should maintain a balanced set of program including science and aeronautics, not focus specifically on human exploration. For FY2006, the House and Senate have passed authorization (H.R. 3070/S. 1281) and appropriations (H.R. 2862) bills for NASA. The appropriations bill, as reported from conference, cut the following Vision-related programs: $25 million from each of the two Exploration Systems research and technology subaccounts; all $34 million from Centennial Challenges; and $200 million from Prometheus. Conferees added $5 million for a "heavy lift" launch vehicle. H.R. 3070 uses a different budget structure than NASA's request, placing "exploration systems" into its own budget account, instead of including it with science, aeronautics, and education. The additional $510 million in the House-passed version of H.R. 3070 would be allocated to the Vision.

Key Congressional Issues

The Relative Priority of NASA in the Federal Budget

With the current emphasis on cutting spending to reduce the federal budget deficit, and the funding requirements associated with hurricane recovery, some may question the amount of money proposed for NASA in FY2006 and beyond. Space program advocates often cite the small percentage of federal budget authority that is allocated to NASA — 0.7 % in FY2005 — as an indication that it is not a significant factor in the nation's overall spending. The Coalition for Space Exploration points out that benefits accrue from space exploration in terms of stimulating children to study math and science, and driving invention, which supports a robust economy. Skeptics counter that spending more than $16 billion on NASA is a luxury when many domestic discretionary programs are being cut, and federal R&D spending overall is not keeping pace with inflation.

The Relative Priority of the Vision Versus Other NASA Activities

Funding. The President's plan calls for most of the funding for the Vision to come from redirecting spending from other NASA activities. In the 2004 "sand chart" (discussed earlier), the programs that are not included in the Vision were labeled *Aeronautics and Other Science Programs*. Funding for those activities, including aeronautics, earth science, and certain space science programs, was shown as remaining flat through FY2020. Advocates of those programs worried that funding for their research would suffer. However, NASA Administrator Griffin, who assumed office in April 2005, has stated that he will not take funds from space science, earth science, or aeronautics programs to pay for the Vision (although he is cutting funding for life sciences and materials sciences research that was to be conducted aboard the ISS in order to pay for accelerated development of the CEV). As discussed earlier, the reports accompanying the House and Senate NASA appropriations and authorization bills express support for the Vision, but only as part of a balanced program that includes science and aeronautics. It should be noted that current budget constraints at NASA are due not only to the need to fund the Vision, but also to cost growth in existing NASA programs (including several science missions), the cost of returning the space shuttle to flight status, and the need to fund congressionally directed items.

Workforce and Institutional Issues. Funding for various NASA activities also will affect NASA workforce levels. NASA officials insist that there are no plans to close any NASA centers, but NASA's FY2006 budget assumes that the number of budgeted civil service full time equivalents (FTEs) will drop from 19,227 in FY2005 to 16,738 by the end of FY2006. How to "right size" NASA, its facilities, and its workforce, and ensure NASA has the necessary skill mix for the Vision, are among the issues facing Congress. The final version of the FY2006 appropriations bill (H.R. 2862) restricts NASA's use of buyouts and Reductions in Force (RIFs) prior to NASA providing certain reports to Congress.

The Future of the Space Shuttle and International Space Station

The Vision calls for the space shuttle fleet to be retired in 2010, when ISS construction is expected to be completed. NASA Administrator Griffin emphasizes his

intention to meet that deadline, citing the need to use that funding to implement other aspects of the Vision. Placing a fixed termination date on the shuttle system, however, may create schedule pressure similar to what the CAIB found to have contributed to the *Columbia* accident (see CRS Report RS21408). One alternative is to fly the shuttle until a replacement is available. Another is to specify how many more shuttle flights are needed, and continue the system until those requirements are met, whenever that is. S. 1281, as passed by the Senate, states that it is U.S. policy to possess the capability for assured human access to space, and directs the NASA Administrator to act to ensure that capability and to make a number of related reports to Congress in future years. The replacement for the shuttle is the CEV (discussed above). President Bush directed NASA to build the CEV so that it would be available by 2014. Dr. Griffin hopes to accelerate CEV development so it is ready in 2012. That would reduce the gap between the end of the shuttle (2010) and availability of the CEV. During such a gap, the United States would be dependent on Russia to take American crews to and from ISS. Russia has indicated that it will not provide ISS crew transport services to NASA for free after April 2006 (when an existing agreement will be fulfilled), but NASA is not permitted to pay Russia for such services under the Iran Nonproliferation Act (INA). The Senate and House have passed different versions of legislation (S. 1713) that would allow NASA to purchase needed services from Russia for a certain time period. (See CRS Report RS22270 for more information.)

NASA officials have indicated that NASA plans to complete its use of the ISS in 2016. Under the Vision, the only U.S. research that would be conducted on ISS is that needed to fulfill the Vision. NASA is downscaling its ISS research plan, which is being further eroded by NASA's decision to shift funds from ISS research into accelerating development of the CEV. NASA spends about $2 billion a year on ISS, in addition to the costs of the shuttle program. Some question whether ISS is worth that level of investment considering the modest research opportunities that remain. Others want to restore the ISS research program to what was previously planned. NASA is building ISS in partnership with Canada, Japan, Russia, and 10 European countries. Others consider fulfilling U.S. commitments to those partners to be a sufficient rationale for continued U.S. involvement. S. 1281 adds $100 million and makes other recommendations to enhance ISS research. H.R. 3070 does not specify an ISS funding level, but directs that 15% of ISS research spending be used for non Vision-related research. The final version of the appropriations bill, H.R. 2862, cuts $80 million from the space station program.

The Future of the Hubble Space Telescope

Two days after the President's Vision speech, NASA announced that it would not use the shuttle to conduct further servicing missions to the Hubble Space Telescope (see CRS Report RS21767). Then-Administrator Sean O'Keefe cited shuttle safety concerns as the primary reason. Widespread criticism led NASA to explore the possibility of a robotic servicing mission. A December 2004 report from the National Research Council, however, concluded that a robotic servicing mission was not likely to succeed in the time available. In the FY2006 request, NASA requested money only for a deorbit mission (to ensure that Hubble reenters from orbit without posing danger to populated areas). Dr. Griffin has pledged to revisit the shuttle servicing decision after the shuttle completes its two "Return to Flight" mission. The final version of the appropriations bill, H.R. 2862, adds $50 million for a Hubble servicing mission, which the accompanying report (H.Rept. 109-272) says brings the total available for Hubble in FY2006 to $271 million.