

## FY 2006 Appropriations for the National Aeronautics & Space Administration (NASA)

(numbers are in millions)

(the FY06 conf. numbers reflect the 1.0% across the board cut to discretionary programs)

*NASA conference language*

NASA	FY 2005 Omnibus	President's FY 2006 Req.	% change FY 05 vs FY 06 Req.	House	Senate	FY06 Conf.	% change FY05 vs. FY06
<b>Science, Aeronautics and Exploration</b>	<b>9,334.7</b>	<b>9,661.0</b>	<b>3.5%</b>	<b>9,725.7</b>	<b>9,761.0</b>	<b>9,663.8</b>	<b>3.5%</b>
<b>Science</b>	<b>5,527.2</b>	<b>5,476.3</b>	<b>-0.9%</b>	<b>5,516.0</b>			
Solar System Exploration	1,858.1	1,900.5	2.3%				
The Universe	1,513.2	1,512.2	-0.1%				
Earth-Sun System	2,155.8	2,063.6	-4.3%				
Solar-B (2006 launch)	11.4	14.3	25.4%				
GLOBE	Not called out	Not called out					
<b>Exploration Systems</b>	<b>2,684.5</b>	<b>3,165.4</b>	<b>17.9%</b>	<b>3,100.0</b>			
<b>Aeronautics Research</b>	<b>906.2</b>	<b>852.3</b>	<b>-5.6%</b>	<b>906.0</b>			
Aviation Safety & Security Program	185.4	192.9	4.0%				
Weather Safety Technologies	Not called out	Not called out (scheduled to end 9/05)					
<b>Education Programs</b>	<b>216.7</b>	<b>166.9</b>	<b>-23.0%</b>	<b>168.9</b>			
Minority Univ. Research & Education	92.8	86.1	-7.2%				
<b>Exploration Capabilities</b>	<b>6,704.4</b>	<b>6,763.0</b>	<b>0.9%</b>	<b>6,712.9</b>		<b>6,596.3</b>	<b>-1.6%</b>
<b>TOTAL, NASA</b>	<b>16,070</b>	<b>16,456</b>	<b>2.4%</b>	<b>16,471</b>	<b>16,396</b>	<b>16,291*</b>	<b>1.4%</b>

## **Detail on Conference (11/9/05):**

Late last week conferees from the Senate's Commerce-Justice-Science (CJS) and the House's Science-State-Justice-Commerce (SSJC) Appropriations Subcommittees came to an agreement for the FY 2006 appropriations for the National Aeronautics and Space Administration (NASA).

\* One important caveat – the conferees have included a .28% across-the-board reduction in this bill. The figures here *do not* include the application of that .28% reduction. Moreover, it is anticipated that as the appropriations process draws to a conclusion in late November or early December, a second government-wide across-the-board reduction or rescission of between 2-5% may be necessary – which would obviously further reduce the budget levels.

The conference agreement must be approved by both the House and Senate, and then the bill will be sent to the President to be signed into law. The House has approved it. Senate approval should soon follow.

Within the SAE account are increases to the budget request the conferees provided:

- \$10 million for the Space Interferometry Mission (funding it at \$119 million).
- \$30 million for the Glory Mission (climate monitoring satellite)
- \$60 million for the Aeronautics Research program of which \$25 million is for hypersonic research
- \$10 million for the Institute for Scientific Research
- \$20 million for the National Center for Advanced Manufacturing
- \$5 million for the Heavy Lift Launch Vehicle
- \$15 million for the Propulsion Research Laboratory
- \$15 million for an earth science competitive grant program, to support projects that "...will integrate the results of NASA's earth observing systems and earth systems models into decision support tools to serve applications on national priority, including but not limited to: homeland security, coastal management, agricultural efficiency, and disaster management."
- \$20 million for alternative small spacecraft technologies
- \$50 million for the Hubble Telescope servicing mission
- \$8.2 million for EPSCoR
- \$1.2 million for the Space Grant program
- \$5 million for Living With a Star program
- \$280 million for Congressionally directed priorities

**Decreases in the SAE account are as follows:**

- \$25 million for Exploration Systems Research & Technology (R&T)
- \$25 million for Discovery missions
- \$25 million for Human Systems R&T
- \$26 million for corporate G&A
- \$34 million for Centennial Challenges
- \$15 million for optical communications
- \$200 million for Project Prometheus
- \$90 million for a general reduction

As stated in the House and Senate Committee reports, the conferees remain supportive of NASA's Moon-Mars Vision, however reiterate their concern for the need to "maintain the nation's leadership in science and technology," and partially restored funding for the agency's core science and aeronautics research programs.

The conferees also warn NASA, in developing the new Vision, to pay particular attention to controlling costs, and directs the agency to notify the Appropriations Committee 30 days prior about its fiscal plans, but allows NASA to maintain flexibility in spending authority within each of its accounts to accommodate any funding level adjustments. "...NASA shall justify the additional expenditure of funds...and shall identify the source of any required additional funds to cover the overrun."

The conferees note that funds within SAE should be used to address the education needs of women, minorities and other historically underrepresented groups. The report also notes the promise of unmanned aerial vehicles (UAVs), and directs NASA to seek such low-cost alternatives to its traditional earth science research missions that could improve weather and severe storm prediction capabilities. The Committees direct NASA and NOAA to provide a report to them by March 30, 2006 on the potential use of UAVs to operate in the near space environment.

The conferees also restate their concern regarding NASA's lack of support for and direction to its Aeronautics research program, and direct the agency to develop a National Aeronautics Policy within one year of enactment of the bill. This report should be guided by the recently published report, "Responding to the Call: Aviation Plan for American Leadership."

The conference report reiterates language in the Senate Committee report, directing NASA to ensure that the EOSDIS and its core system "remain the operational foundation of the evolutionary ground system to implement all of the new missions funded as a result of the earth science decadal survey."

### **Detail on Senate Markup (6/23/05):**

The Senate Commerce, Justice, Science Appropriations Subcommittee approved \$16.396 billion for NASA in FY 2006. This is a \$326 million increase above the FY 2005 level, but \$75 million and \$60 million less than the House passed level and the President's budget request, respectively.

Within this amount, the Subcommittee provides for \$9.761 billion for the **Science, Aeronautics, and Exploration (SAE) account**. This is \$2.12 billion above the FY 05 level, and \$35.3 million and \$100 million more than the House and President's request, respectively. *Note: the large disparity between the FY 06 proposal and the FY 05 level is mostly due to programmatic transfers from the Exploration account into SAE.*

The majority of the increase for NASA would be for an SM-4 servicing mission for Hubble to be completed by the end of 2008. The Subcommittee provides \$250 million for this mission, pending a final decision by the NASA Administrator. To accommodate this large increase for Hubble, NASA will likely need to cut more than \$150 million from existing SAE missions and priorities.

In addition to the Hubble servicing mission, \$20 million within the Exploration Systems funding is targeted for evaluation of alternative small spacecraft technologies capable of reducing planetary

exploration costs. Language is also included which caps missions within the Discovery program at \$350 million, supports the requested level for the Living With A Star program, which received an increase in the House, and provides the requested amount for the Solar Terrestrial Probes program.

The Subcommittee expresses its support of Earth science missions and programs, with a proposed increase of \$15 million for the Earth Science Applications program for competitively selected projects. In addition, the Subcommittee directs NASA, in consultation with the National Oceanic and Atmospheric Administration, to report on the potential use of unmanned aerial vehicles in near space environment for the study of among others, weather prediction, climate change, global-scale vertical resolution and profiling, atmosphere-ocean-land exchange processes, ecosystem monitoring, and coastal zone imaging.

The Subcommittee directs NASA to halt the dismantling of the Vehicle Systems Program (VSP) as proposed by the budget request and expresses its support for the seven major projects of the existing VSP, with additional language supporting aeronautics funding and research in general, and \$25 million to support research on hypersonic engine technologies. Funding for University Research Engineering and Technology Institutes (URETI) and Research Partnership Centers (RPC) are supported at the FY 2005 level and NASA is directed to provide a plan for sustained university/industry partnerships in areas of technology that are critical to the success of the Vision.

The language includes \$6.603 billion for the **Exploration Capabilities (EC) account**. This is \$1.755 billion below the FY 05 level, and \$109 million and \$160 million below the House and the President's request, respectively.

This amount includes \$4.53 billion for the Shuttle program, which is the same as the request.

In addition, in the report language accompanying the bill, the Subcommittee states its support for the President's Moon-Mars Vision but also expresses reservations about moving forward without comprehensive authorization legislation. With respect to the balance of science priorities within the exploration agenda, the Subcommittee states that it "is concerned that the strong, balanced science program that has served the Nation so successfully for many years could be left behind instead of being nurtured and sustained. That science program has been based on a set of carefully crafted scientific strategies that are founded on scientific and technical merit, relevance to overall national needs, and broad consultation with the scientific community. NASA is encouraged to look for ways to maintain a balance with the productive science NASA is known for and currently has underway, while taking the steps to fulfill the exploration vision."

**Detail on House Markup (6/7/05):**

The Committee provides \$16.5 billion for NASA, \$15 million above the President's request and \$275 above FY05. The report restores funding to multiple programs in aeronautics research and science, including the Glory mission, which was nearly zeroed-out in the President's budget request. Glory, according to the report, "is a key Global Climate Research Initiative (CCRI) mission and critical to the achievement of CCRI's science goals." In total, the Committee calls for \$9.7 billion for science, aeronautics and exploration, \$65 million above the budget request and \$265 million above FY05. \$40 million of that increase is dedicated to science programs.

The report also commends the decision to reconsider a Hubble servicing mission, which had been abandoned in favor of a deorbit-only mission by NASA's previous administrator. "This mission is

not only essential to maintaining the capability of the most scientifically successful space astronomy mission to date,” the report reads, “it also provides for the least expensive approach to service Hubble and at the same [time] provides for the deorbit capability that will assure HST’s safe reentry.”

The Appropriations Committee report includes the following language regarding the FY06 request: “The Committee is very concerned about the reductions to NASA’s science programs especially the drastic reductions to earth science programs designed to provide a better understanding of our planet.”

The House provided an increase for Science, Aeronautics and Exploration: \$64,750,000 above the FY06 President’s request and \$265,050,000 above FY05. Increases above the budget request include \$40 million for science programs, including the following:

\$30 million is for the Glory mission;

\$10 million is for the Space Interferometry Mission;

\$54 million for aeronautics research programs;

\$2 million for education programs; and

\$50 million for other initiatives terminated in the request (projects not specified).

Reductions to the budget request include:

\$25 million from exploration systems research and technology;

\$25 million from human systems research and technology; and

\$31.5 million from corporate administrative costs

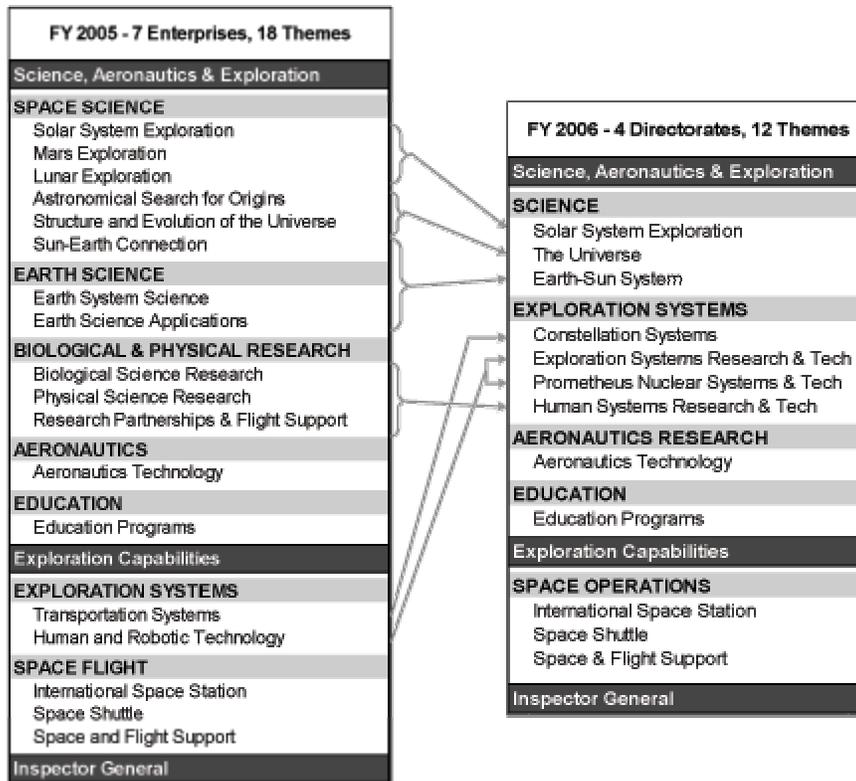
#### **Notes on House Markup (5/24/05):**

The House Appropriations Science, State, Justice and Commerce Subcommittee marked up its bill funding NASA, NSF and NOAA this morning. More detail will be posted when the Committee report is released. NASA is funded at \$16.41 billion, \$275 million above FY05 and \$15 million above the request. Funds the President’s vision for space exploration at \$3.1 billion; restores the aeronautics research program to the enacted level of \$906 million, and provides \$40 million over the request to partially restore NASA’s science programs. Provides full request for the Space Shuttle program. In coordination with the House Science Committee, language is included directing the President to develop a national aeronautics policy.

#### **Notes on President’s FY 2006 Request**

Despite the continued success of a number of important scientific missions, NASA would share in the overall tightening of the federal budget, with a proposed 2.4 percent\* increase, or \$386 million, bringing the total funding level to \$16.456 billion.

The NASA budget has been reorganized into three funding accounts – the Science, Aeronautics, and Exploration (SAE) account, which includes almost all the science and academic programs, including propulsion technology development as well as some cross-cutting technology programs; the Exploration Capabilities (EC) account, which includes the Space Flight support; and the Inspector General account. The new budget structure is organized as follows:



The lion's share of the increase would go to the Office of Exploration Systems, within SAE, to fund initiatives supported by the President's Moon-Mars Vision. The Offices of Science, Aeronautics, and Education are all proposed to decrease for the second year in a row.

\* - [Please note: all figures from FY 2005 do not include \$550 million in Congressional earmarks and supplemental funding which NASA did not incorporate into its FY 05 operating plan.]

## **Science, Aeronautics and Exploration (SAE)**

### **Office of Science Directorate**

Within the SAE account, the Office of Science, which includes both space and earth science activities, would receive \$5.476 billion, a decrease of \$51 million from the FY 2005 level. The Directorate would have been reduced much more but NASA transferred the Exploration Systems Enterprise into the SAE account to bolster the funding figure. The Office of Science includes three Enterprises:

*Solar System Exploration* – The request proposes a \$42.4 million (or 2 percent) increase.

This funding level would include:

- \$723.1 M (up 4.6 percent) to continue the Mars Exploration program, which is expected to double by 2009;
- \$136.9 M for launch and operation of New Horizons Pluto Kuiper Belt Mission, and Dawn;
- \$257 M to continue deep-space mission support, including Cassini, Stardust, Genesis, and MESSENGER;

- \$96 M for technology development of in-space propulsion and radioisotope power system development;
- \$184 M for the conceptual development of the Mars Science Laboratory, a rover with an on-board laboratory; and
- \$105 M for the continued development of the Lunar Reconnaissance Orbiter.

*The Universe* – The request proposes a \$1 million (or 0.07 percent) decrease.

This funding level would include:

- \$372 M to James Webb Space Telescope, the next generation replacement of the Hubble telescope;
- \$191 M for Hubble to consider life extension activities and development activities for a robotic deorbit spacecraft (note: the budget does not include funds for a re-servicing mission);
- \$109 M to progress the Space Interferometry Mission through the critical design phase of the project;
- \$100.8 M (up \$18.8 M) for the Explorer program, which recently announced its latest selection after a year of delays; and
- \$55.5 M (up \$13.7 M) for the Beyond Einstein program, which funds LISA and Con-X, and is proposed to triple by FY 2008.

*Earth-Sun System* – The request proposes a \$92.2 million (or 4.3 percent) decrease

This funding level would include:

- \$234 M (up \$31.5) for the Living With a Star program, of which \$159 M will be allocated Solar Dynamics Observatory ;
- \$47.7 M for the launch and initial operations of the Solar Terrestrial Relations Observatory;
- \$845 M (up \$26.5) for Earth Sun system research to support algorithm development and improvement and laboratory and field experiments to validate satellite-based observations;
- \$117.1 M (up \$13.5 M) for the Explorer program, which is co-managed in Earth-Sun System and the Universe enterprises; and
- \$181.9 M (down \$118.5 M) for Earth Systematic Missions, due to the de-scoping of GLORY.

### **Office of Exploration Systems Directorate**

Within the SAE account, the Office of Exploration Systems, which includes the majority of the President's programs supported within the Moon-Mars Vision announced in January 2004, would receive \$3.165 billion, an increase of \$480.8 million (or 17.9 percent) from the FY 2005 level. The Office of Exploration Systems includes four Enterprises:

*Constellation Systems* – The request proposes a \$593.6 million (or 112.7 percent) increase. A majority of this funding would be for further developments in a new Crew Exploration Vehicle.

*Exploration Systems Research and Technology* (formerly a part of the Exploration Capabilities Directorate) – The request proposes a \$223.6 million (or 32.1 percent) increase. A majority of this

funding would be for Technology Maturation and Advanced Space Technology programs involving various propulsion systems and other integrated technologies needed for the Moon-Mars Vision.

*Prometheus Nuclear Systems and Technology* – The request proposes a \$112.1 million (or 26 percent) decrease. This reduction is primarily a result of NASA no longer proposing the Jupiter Icy Moons Orbiter (JIMO) as the first mission to use nuclear propulsion technology. Instead, NASA intends to consider other “less costly and less risky” missions. Previously, the National Academies of Sciences had selected JIMO as the best mission, with the highest science yield, to be the test bed for the new nuclear technology.

*Human Systems Research and Technology* – The request proposes a \$224.3 million (or 21.8 percent) decrease. This Enterprise includes programs included in the former Biological and Physical Research Enterprise.

### **Office of Aeronautics Research Directorate**

Within the SAE account, the Office of Aeronautics Research would receive \$852.3 million, a decrease of \$53.9 million (or 5.9 percent) from the FY 2005 level. This is the second year in a row that the office would be reduced and is projected to continue to receive these reductions in future years.

The request would include:

- \$192.9 million for Aviation Safety and Security projects to decrease accident and fatality rates;
- \$200.3 million for Airspace Systems projects; and
- \$459.1 million for Vehicle Systems projects to demonstrate technologies that will reduce aircraft noise emissions, and to develop uncrewed aerial vehicles for Earth and space science missions.

### **Office of Education Directorate**

Within the SAE account, the Office of Education would receive \$166.9 million, a decrease of \$49.8 million (or 23 percent) from the FY 2005 level. This is the second year in a row that the office would be reduced and is projected to continue to receive these reductions in future years. The majority of this decrease (\$32 million) would be in the Higher Education programs. This is mainly due to continued phase out begun in FY 2005 of the Undergraduate Student Research Program (USRP).

### **Exploration Capabilities**

The Exploration Capabilities account would receive \$6.763 billion, a \$67.4 million (or 0.1 percent) decrease from the FY 05 level. This amount would include a \$138.4 million decrease for the Space Shuttle program, a \$109.5 million decrease for Space and Flight Support, and a \$180.4 million increase for the International Space Station. However, the research funding for the International Space Station would be reduced.