Summary and Analysis of the President’s FY 2008 Budget Request for Federal Research and Education Programs

Prepared by Lewis-Burke Associates LLC

February 6, 2007
Overview

The President released his $2.9 trillion FY 2008 budget request on Monday, February 5, calling on Congress to provide increased funding for new troops in Iraq, keep overall domestic discretionary spending levels below the rate of inflation, support decreases in the rates of growth of certain entitlement programs, and enact various budgeting reforms to meet the Administration’s goal of eliminating the budget deficit by 2012. However, while Presidential budget requests are always just the opening move in the annual budgetary process during which Congress makes changes both large and small to the proposed spending plan, the FY 2008 budget request risks becoming largely irrelevant even sooner than usual this year for a number of reasons.

First, the Administration’s budget is being received by a Democratic-controlled Congress, and the majority party has reasons both philosophical and political to want to declare the Administration’s priorities and budgetary assumptions dead on arrival. Second, because Congress has not yet completed work on the FY 2007 budget, the Administration had little choice but to use its FY 2007 budget request as the baseline for its FY 2008 proposal (except for the Departments of Defense and Homeland Security, for which Congress was able to complete appropriations last year). The funding levels in the FY 2007 spending resolution being finalized by Congress, however, are in most cases quite different from those requested by the Administration for FY 2007, which means that Congressional budget and appropriations committees will find many of the FY 2008 request’s proposals immaterial.

The FY 2008 budget request does, however, contain some proposals and themes which are in many ways consistent with recent actions by Congress. Fortunately for the research and higher education communities, one of these is a continued emphasis on innovation and competitiveness. The budget request would continue the American Competitiveness Initiative (ACI), which the Administration requested first in FY 2007 and which would double over 10 years the budgets of the National Science Foundation (NSF), the Department of Energy’s (DOE) Office of Science, and the National Institute of Standards and Technology (NIST). While most of the federal government would be funded at FY 2006 spending levels under the resolution now being completed by Congress, additional funding has been made available for NSF research, DOE’s Office of Science, and NIST. Likewise, the Administration is proposing a significant increase in the maximum Pell Grant award in FY 2008, while Congress has included a substantial increase in its FY 2007 spending resolution as well. In addition to the ACI, the Administration’s request includes strong emphases on ocean research, climate change R&D, and particularly alternative and renewable energy R&D.

Not all federal research and education programs, however, would do as well under the FY 2008 request as those under the ACI umbrella. These include NASA science programs and in particular the Department of Defense’s basic and applied research programs which would be significantly cut under the Administration’s request. The National Institutes of Health (NIH) is slated for a $620 million increase by the Democratic Congress for FY 2007; the Administration’s request for FY 2008 for NIH is significantly below this level.
Please note that, unless otherwise noted, comparisons in the budget analyses below use the FY 2007 funding levels included in the spending resolution currently being finished in Congress, rather than the FY 2007 budget request level included in the Administration’s budget documents; this decision was made to provide readers with the truest sense of how the Administration’s FY 2008 proposals would actually impact funding levels at the various agencies.

National Science Foundation

The FY 2008 National Science Foundation (NSF) budget request totals $6.4 billion. This amount represents an increase of about $400 million or 7 percent over last year. The NSF research and related activities account – the account that provides funds for NSF’s disciplinary and interdisciplinary research programs – is proposed to increase to $5.1 billion, an increase of about $360 million or 8 percent increase over the level for FY 2007. This increase is consistent with the growth and emphasis the Administration has placed on the second year of its American Competitiveness Initiative (ACI). The computer and information science and engineering directorate would increase by 9 percent; engineering would grow by 7 percent; and the mathematical and physical sciences directorate would grow by 9 percent. The NSF Director noted in his budget presentation that these directorates received the most significant increases because they are explicitly part of the Administration’s ACI.

The growth in the mathematical and physical sciences would be used to strengthen – among other areas – fundamental mathematical and statistical science, and sustainable use of energy and natural resources. The mathematical sciences division would receive an increase of 8.6 percent while the astronomy division would receive an increase of 8.3 percent.

The geosciences, helped in part by the Administration’s interagency ocean research priorities plan, interest in climate change science, and the International Polar Year (IPY), would grow by 6 percent to a level of nearly $800 million. Within this directorate, the ocean sciences division would grow by 7.2 percent and the atmospheric sciences division would grow by 6.2 percent. The National Center for Atmospheric Research would receive an increase of 4.7 percent over the FY 2007 level.

The office of cyberinfrastructure would grow by nearly 10 percent. This comes on the heels of a 40 percent increase in FY 2007 as NSF moves aggressively to expand its support for the development, acquisition, and operation of state-of-the-art cyberinfrastructure resources. This includes information technology resources and tools such as petascale high end computers, high-capacity mass-storage systems, system software suites and programming environments, visualization tools, productivity software libraries and tools, and an array of software tools and services to support this important area in science and engineering.

As far as major new NSF-wide initiatives in this budget proposal three stand out for special mention. First, NSF is proposing a new program called Cyber-enabled Discovery
and Innovation (CDI) with a request of $52 million. CDI is to support a new generation of computationally based discovery concepts and tools to deal with complex, data-rich, and interacting systems. CDI will support new concepts at the intersection of computational and physical or biological worlds. The goal is to accelerate the discovery of knowledge buried in massive datasets, creation of models to understand complex phenomenon, and understanding rare events. CDI will have, at the outset, five themes: knowledge extraction, interacting elements, computational experimentation, virtual environments, and education for computational discovery.

NSF will also continue its significant participation in the interagency National Nanotechnology Initiative at $390 million, an increase of 4.5 percent over last year’s level. This includes a new multidisciplinary focus on research on the environmental, health, and safety impacts on nano-materials.

Finally, the NSF budget request includes $17 million specifically for NSF’s participation in the interagency Ocean Research Priorities Plan (ORPP) which was developed by the Joint Subcommittee on Ocean Science and Technology. These additional funds will support research in four near-term priority areas: dynamics that impact marine ecosystems; the variability of the Atlantic Meridional Overturning Circulation; response of coastal ecosystems to extreme and abrupt events; and the development of new sensors to improve ocean observation.

NSF’s Major Research Equipment and Facilities Construction (MREFC) account – the account used for the construction or acquisition of unique major research platforms – is slated to receive a 5% increase over the level anticipated for FY 2007. The MREFC account includes funding to begin a major upgrade to the Laser Interferometer Gravitational Wave Observatory (LIGO -- $32.8 million). Other projects slated to receive support include the Atacama Large Millimeter Array (ALMA) radio telescope at $102 million, Alaska Region Research Vessel at $42 million, IceCube would receive $22.4 million, the National Ecological Observatory Network (NEON) would receive $8 million (assuming it does start construction in FY 2007); and the Ocean Observatories Initiative (OOI) would receive $31 million (assuming it too does start construction and acquisition activities in FY 2007).

NSF’s Education and Human Resources account, which provides support for K-12, undergraduate, and graduate programs, as well as programs that support the broadening of participation in science and engineering, comes in with a request of $750.6 million. This is 5 percent more than the amount originally planned for FY 2007 and 7.2 percent over the FY 2006 level. Within EHR, the FY 2008 request would provide:

- $222.5 million for the Division of Research on Learning in Formal and Informal Settings (DRL), an increase of $7 million (3.2 percent) above the level anticipated in FY 2007. DRL is the result of a recent merger between EHR’s elementary, secondary & informal education division and its research & evaluation division.
• $210.2 million for the Division of Undergraduate Education (DUE), an increase of $13.4 million—a reduction of $2 million (less than 1 percent) below the level anticipated in FY 2007. The request proposes increases in DUE’s Course, Curriculum & Laboratory Improvement; Advanced Technological Education; and STEM Talent Expansion programs. The National STEM Digital Library would be funded at $16.5 million. The budget request includes $46 million for NSF’s math and science partnership program— the same amount as planned for FY 2007. Of the $46 million requested, however, about $30 million will be available for new awards.

• $169.5 million for the Division of Graduate Education (DGE), an increase of $16.4 million (10.7 percent) above the FY 2006 enacted level. The new funds would be directed entirely to the Graduate Research Fellowships program, bringing the overall level of that program to $97.5 million.

• $148.4 million for the Division of Human Resources Development (HRD), an increase of $28.6 million (23.9 percent) above the FY 2006 enacted level. The Research and Education Infrastructure initiative, which includes the Alliances for Graduate Education and the Professoriate (AGEP) and the Centers of Research Excellence in Science and Technology (CREST) will be emphasized under this budget proposal.

**National Aeronautics and Space Administration**

Under the FY 2008 budget request, NASA would receive $17.3 billion, or 3.1 percent (+$517 million) above the FY 2007 request and possibly as much as $1 billion over the final amount included in the joint funding resolution being debated in the Senate later this week or next.

*Continuing its annual trend of reorganization, NASA has changed the means by which it counts overhead and the accounts through which it funds individual missions, making comparisons from prior fiscal years to the current budget request difficult.* Like last year, when compared to the overall tightening of non-defense discretionary programs within the federal budget, NASA fared better than several other agencies but not as well as some.

The NASA budget is organized into three funding accounts— the Science, Aeronautics, and Exploration (SAE) account, which includes almost all the science and academic programs; the Exploration Capabilities (EC) account, which includes the Space Flight support; and the Inspector General account.

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

The Administration has requested $10.483 billion for the SAE account, a reduction of $167 million, or 1.57 percent, from the FY07 budget request.
Science Mission Directorate (SMD)

Within this amount, the Science Mission Directorate would receive $5.516 billion, an increase of $49.2 million, or one percent, above the FY07 budget request, continuing the trend for science which Administrator Griffin introduced last year. Within Science, Earth Science and Heliophysics received the larger increases, while Planetary Science and Astrophysics were cut and remained flat respectively.

Earth Science – Overall this account would receive $1.497 billion or $33 million more than the FY 2007 request level, including decreases in the Research and Analysis awards, but increases in funding for Landsat Data Continuity Mission (LDCM), Glory mission, NPOESS Preparatory Project (NPP), and Global Precipitation Measurement (GPM) mission to maintain current schedule.

Heliophysics – Overall this account would receive $1.057 billion or $29 million more than the FY 2007 request level, including decreases for the Solar Dynamics Observatory but increases in other Living With a Star programs and for Research and Analysis awards.

Planetary Sciences – Overall this account would receive $1.395 billion or $15.4 million less than the FY 2007 request level, with a significant portion coming from the Mars program, but also including new opportunities for the New Frontiers program, full funding for the Mars Science Laboratory, and increases for the Research and Analysis awards.

Astrophysics – Overall this account would receive $1.565 billion or $2.8 million more than the FY 2007 request level, with flat funding for Research and Analysis and reductions in the Navigator program, which includes a downgrade of the Space Interferometry Mission to a technology development program.

Exploration Systems Mission Directorate (ESMD)

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, The Exploration Systems Mission Directorate would receive $3.923 billion, a reduction of $228 million, or 0.5 percent below the FY07 budget request.

Constellation Systems – The request proposes $3.068 billion, a cut of $164 million, or one percent, below the FY07 budget request. A majority of this funding would be for further developments in a new Crew Exploration Vehicle and a Crew Launch Vehicle.

Advanced Capabilities – The request proposes $855.8 million, a cut of $64.2 million, or about 7 percent, below the FY 07 budget request. This reflects continued trends in reductions for exploration systems technology and human research, as well as cuts in funding for lunar robotic exploration.

Aeronautics Research Mission Directorate (ARMD)
Within the SAE account, The Aeronautics Research Mission Directorate would receive $554 million, an increase of $24.7 million, or 4.67 percent, above the FY07 budget request. Aeronautics was proposed for a large decrease last year but Congress restored it (for the second year in a row) in the currently debated joint resolution.

The request would include $293.4 million (down $12 million) for the Fundamental Aeronautics Program, with four key research areas:

- combustion foundational research and aerothermodynamics system integration for the Subsonic Fixed Wing project;
- advanced control methods and cabin noise modeling and reduction for the Subsonic Rotary Wing project;
- high-temperature sensors, advanced inlet/nozzle concepts, aero-propulsive-servo-elasticity and lightweight multifunctional materials for the Supersonics project; and
- advanced structural concepts, durability technologies, and nondestructive evaluation methods for the Hypersonics project.

The long-term goals of the Fundamental Aeronautics Program (FA) are to significantly advance the state-of-the-art in fundamental technologies critical to reducing noise, emissions and fuel consumption and increasing the performance of future vehicles in all speed regimes. In addition, the FA Program contributes to the development of fundamental ideas and models to aid in the Entry, Descent, and Landing (EDL) phase of re-entry vehicles.

**Education Program**

Within the SAE account, the Education program would receive $153 million, a reduction of $13.7 million, or eight percent, below the FY07 budget request. This is the fourth year in a row that the office would be reduced despite being projected to receive the same level in future years. The majority of this decrease would be in the Higher Education and Informal Education programs.

Within the Higher Education program:

- The phase out begun in FY 2005 of the Undergraduate Student Research Program (USRP) has stopped and USRP would receive $3.69 million (same as last year’s request); and
- Space Grant would receive $29 million, or $0.2 million above last year.

**Exploration Capabilities**

The Exploration Capabilities account would receive $6.797 billion, (up 11.2 percent) from the FY 2007 request, reflecting substantial increases of approximately $683.4 million (more than the overall NASA increase).

This amount would include:

- $10 million decrease for the Space Shuttle program;
$476 million increase for the International Space Station – primarily for assembly and support; and

$217 million increase for Space and Flight Support.

**National Oceanic and Atmospheric Administration**

For fiscal year 2008, the President proposes a budget of $3.815 billion for the National Oceanic and Atmospheric Administration (NOAA). This amount is approximately $96 million or about 2.5 percent below the amount in the FY 2007 joint funding resolution which is currently circulating in Congress. The request includes a modest increase of about $41 million (1.5 percent) for the Operations, Research and Facilities (ORF) account and a decrease of about $138 million (14 percent) for the Procurement, Acquisition and Construction account. The NOAA request seeks to “sustain critical operations” while at the same time focus on four main areas (please note that any budgetary increases mentioned below are comparisons over the President’s FY 2007 budget request, not the FY 2007 joint funding resolution that is currently being considered in Congress):

(1) **Supporting the U.S. Ocean Action Plan.** In January 2007 the Administration released its interagency Ocean Research Priorities Plan (ORPP) which identifies 21 of the most pressing priorities facing the oceans, coasts and Great Lakes, including four near-term priorities. This report was a product of the U.S. Ocean Action Plan which was developed by the Administration to address the recommendations made by the U.S. Commission on Ocean Policy in 2004. The President’s FY 2008 budget for NOAA includes $123 million in new money to support the U.S. Ocean Action Plan and to work toward the implementation of the ORPP. Specifically, this includes funds to:

- **Protect and improve marine and coastal areas** ($38 million)—enforcement and management activities in the Northwestern Hawaiian Islands Marine National Monument; restoration of 1,000 stream miles of habitat for Atlantic salmon and other species; support for the Coastal and Estuarine Land Conservation Program; support for Klamath River salmon recovery projects; and competitive grants for Gulf of Mexico Alliance coastal resource priorities.

- **Ensure sustainable use of ocean resources** ($25 million)—provides support to “ensure sustainable access to seafood through development of offshore aquaculture and better management of fish harvests.”

- **Advance ocean science and research** ($60 million)—includes a $16 million increase for the Integrated Ocean Observing System (IOOS); $20 million increase to address the four near-term priorities identified in the ORPP; and an additional $8 million to explore and define areas of the continental shelf that are adjacent to but still outside of U.S. jurisdiction.

(2) **Improving Weather Warnings and Forecasts.** In an effort to provide decision makers with better observations, analyses, predictions and warnings, the Administration proposes an increase of $2 million to accelerate research into improving hurricane intensity
forecasts; $3 million increase to support operations and maintenance of 15 hurricane buoys; and an additional $1.7 million to deploy additional deep-ocean buoy (DART) stations in order to strengthen the U.S. Tsunami Warning Program.

(3) Climate Monitoring and Research. To continue with improvements in climate prediction capabilities, the Administration is proposing a $4.4 million increase for the development of an integrated drought early warning and forecast system as part of the National Integrated Drought Information System (NIDIS). The President also requests a $5 million increase in support of the ORPP to enhance understanding between ocean currents and rapid climate change. Lastly, an additional $1 million is requested for additional computational support for assessing abrupt climate change.

(4) Critical Facilities Investments. The increases proposed by the Administration for critical facilities pertain to the modernization of NOAA facilities in order “to provide safe and efficient work environment for employees.” This money is not intended for extramural facilities and infrastructure.

Below is a breakdown of the President’s funding request according to NOAA program office:

**National Ocean Services.** The President’s budget requests $468 million for the National Ocean Service (NOS), a 26 percent decrease from the FY 2007 joint funding resolution. Within NOS, Navigation Services would receive $144 million and Ocean Resources Conservation and Assessment would receive $156 million. This includes $48 million for the National Centers for Coastal Ocean Science; $14 million increase for IOOS; $11.5 million increase for the development of regional components of IOOS; additional $5 million to develop and integrate decision-support tools for hurricane hazards and watershed influences (ORPP priority); $5 million increase to develop sensors for rapid detection of toxins (ORPP priority); and a $1 million increase to implement the Ocean and Human Health strategic plan. In addition, the Ocean and Coastal Management account would receive $137 million.

**National Marine Fisheries Service.** The President proposes a total of $796 million (a decrease of about 1 percent from the FY 2007 joint resolution) for the National Marine Fisheries Service (NMFS). Included in this total is $165 million for Protected Species Research and Management, $325 million for Fisheries Research and Management, $87 million for Enforcement and Observers/Training, and $50 million for Habitat Conservation and Restoration. Under Fisheries Research and Management, an increase of $5 million is requested for Comparative Analysis of Marine Ecosystem Organization (CAMEO), an ORPP priority. Also, an increase of $6.5 million is included for the support of new requirements of the Magnuson-Stevens Reauthorization Act of 2006, which was passed and enacted into law during the 109th Congress last year. In addition, NOAA requests a $3 million increase for NMSF aquaculture activities. For FY 2008, NOAA no longer requests funding for the Alaska Composite Research and Development Program.
NOAA Research – Office of Oceanic & Atmospheric Research. Under the President’s request, OAR would receive $369 million, a decrease of about 3 percent from the FY 2007 joint funding resolution. Within OAR, Climate Research would receive $193 million. This includes $50 million for Laboratories and Cooperative Institutes and $133 million for the Competitive Research Program. The ORPP priority—Assessing Atlantic Meridional Overturning Circulation Variability—is also supported with a $5 million increase (over the FY 2007 President’s request). In addition, the request would provide Weather and Air Quality Research with $47 million, including $44 million for Laboratories and Cooperative Institutes.

Lastly, Ocean, Coastal and Great Lakes Research would receive $105 million in the President’s budget, a 20 percent cut from the FY 2007 joint funding resolution. The request seeks to merge the National Undersea Research Program (NURP) with the Ocean Exploration to create a new line office called the Ocean Exploration and Research Program. The requested funding for the combined program is $27.7 million for FY 2008. This represents a 19 percent increase over the combined budgets under the FY 2007 joint funding resolution. In addition, the President proposes to flat-fund the National Sea Grant College Program at roughly $55 million for the third year in a row. The Laboratories and Joint Institutes would be cut to $20 million (13 percent decrease) and the Invasive Species and Partnership Programs would for the second year in a row be zeroed-out from the Ocean, Coastal and Great Lakes Research subactivity.

National Weather Service. Like last year, the President requests a budget increase for the National Weather Service (NWS), providing $903 million, a 6.5 percent boost over the FY 2007 joint resolution. Local Warnings and Forecasts would receive $591 million for the operation of 15 weather data buoys, for strengthening the U.S. Tsunami Warning Program and for other purposes. The U.S. Weather Research Program/THORPEX would receive $6 million in the President’s request, down from the FY2007 request but a million dollar increase over the FY 2007 joint resolution. In addition, the Advanced Weather Interactive Processing System (AWIPS) budget would be increased to $37.7 million and NEXRAD would be bumped up to $44 million.

National Environmental Satellite, Data and Information Service. The NESDIS Operations, Research and Facilities account would receive a 13 percent decrease from the FY 2007 joint resolution, with a proposed budget of $157.8 million. This includes $105 million for Environmental Satellite Observing Systems and $52.6 million for NOAA’s Data Centers and Information Services.

NOAA Education Program. The FY 2008 request for the NOAA Education Program is $19 million. Within this amount, NOAA is seeking to provide funding for the Hollings Scholarship ($3.7 million), the Nancy Foster Scholarship ($400,000), JASON Education and Outreach ($1 million), and the Education Partnership Program ($14 million).
Department of Energy

President Bush taps the Department of Energy (DOE) for important initiatives for the nation in his FY 2008 budget request. As outlined in his State of the Union address, the President places significant emphasis on the development of clean, renewable energy sources to reduce the nation’s dependence on foreign oil and to address the challenge of global climate change. The President also requests additional funding to continue initiatives associated with the American Competitiveness Initiative (ACI) and the Advanced Energy Initiative (AEI).

For the Department of Energy overall, the President requests $24.3 billion for FY 2008, which is an increase of $705.3 million (+3 percent) over his FY 2007 budget request. This is good news as the President’s FY 2007 request showed no growth for DOE over the enacted FY 2006 funding level.

The President proposes $3.1 billion for energy programs in FY 2008, an increase of $505.9 million (+19.6 percent) above his FY 2007 request. Funding increases are proposed for energy efficiency and renewable energy ($59.8 million or 5.1 percent); for fossil energy R&D ($214.2 million or 33 percent); and for nuclear energy ($242 million or 38.2 percent).

The Office of Science would receive $4.4 billion in FY 2008, an increase of $296.2 million (+7.2 percent). A significant increase is provided for the fusion program, reflecting the U.S. participation in the International Thermonuclear Experimental Reactor (ITER) program. The President proposes $427.9 million for the fusion program, an increase of $108.9 million (+34.1 percent). To sustain momentum in his Advanced Energy Initiative, the President requests $1.5 billion for Basic Energy Sciences, an increase of $77.5 million (+5.5 percent) above his FY 2007 request.

For DOE’s nuclear programs, the President requests $9.4 billion, an increase of $71 million (+0.8 percent) above his FY 2007 requested level. The Administration again proposes a reduction in the environmental management programs of DOE requesting $6.3 billion, which is $229.5 million (-3.5 percent) below the FY 2007 request. The proposed level is $818.3 million below the FY 2006 enacted level.

DOE Office of Science

The FY 2008 request for the Office of Science totals $4.4 billion, an overall increase of $296.2 million (+7.2 percent) above the FY 2007 request. This office was a major focus in FY 2007 with the President’s proposed doubling of research for the physical sciences over ten years. Over two years, the President proposed a 21 percent increase for the Office of Science. For FY 2008, all programs within the Office of Science receive a funding increase above the FY 2007 budget request reflecting a continued commitment to the President’s ACI and AEI.
High Energy Physics is requested at $782.2 million, receiving the smallest proposed increase within the Office of Science at $7.1 million (+0.9 percent) above the FY 2007 requested level. The FY 2008 budget reflects significant changes in the overall HEP budget. The FY 2008 budget requests an increase of $52 million for new research in non-accelerator physics, theoretical physics, and advanced technology R&D, while funding for the Stanford Linear Accelerator Laboratory (SLAC), which is scheduled to end operations at the B-Factory at the end of FY 2008, is reduced and transferred to the Basic Energy Sciences program. The SLAC program change and adjustments to programs at Fermilab offset these increases by nearly $45 million. Funding for continued R&D on the International Linear Collider is proposed at $60 million, the same as in the FY 2007 request.

The FY 2008 budget reduces HEP funding for the B-factory at SLAC by $37.1 million to a level of $55.8 million, as SLAC programs are transferred to the Basic Energy Sciences budget. The budget reconfigures the new start for the Electron Neutrino Appearance (EvA) Detector at Fermilab into a major item of equipment (MIE) and renames the project NOvA for a net reduction of $5.4 million in the budget below the FY 2007 request. The budget is also reduced by $3.2 million for completion of the U.S. contribution to LHC detectors. An increase of $5.2 million to a total of $62 million is proposed for LHC support. Core operations at Fermilab are held to $216.2 million, an increase of $500,000 above the FY 2007 request level.

The proposed increases of $52 million for the High Energy Physics program would go to Non-Accelerator Physics with a request of $72.4 million (+$13.1 million); to Theoretical Physics with a request of $56.9 million (+$4.8 million); and to Advanced Technology R&D with a request of $183.4 million (+$24 million), with some of the funding going to superconducting radio frequency (RF) technology. A $10.1 million increase is proposed for research to maintain strong participation in the Tevatron at Fermilab, at the Large Hadron Collider (LHC) at CERN in Switzerland, and in neutrino physics.

Nuclear Physics would receive $471.3 million, an increase of $17.3 million (+3.8 percent) above the FY 2007 requested level. $5.1 million of the increase will support research and operations at the Thomas Jefferson National Accelerator Facility in Virginia; at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National laboratory in New York, and at two smaller facilities at Oak Ridge and Argonne National Laboratories. $8.1 million of the increase will support research at other national laboratories and universities, and $1 million is provided for work on rare isotope beam capabilities. $3.2 million will go to pending construction projects.

Biological and Environmental Research would receive $531.9 million in the FY 2008 budget, an increase of $21.6 million (+4.2 percent) above the FY 2007 request. $18.2 million of the increase is focused on life sciences with $154.8 million provided to initiate a third Genomes to Life bioenergy research center and to fully fund two new bioenergy research centers being initiated in FY 2007 (+$19.5 million). Climate change research will be funded at $138.1 million, an increase of $3.2 million overall with new resources provided to create a first-generation Earth System model.
Basic Energy Sciences would receive $1.5 million, an increase of $77.5 million (+5.5 percent). The Administration increase funding for Nanoscale Science research by $13.8 million to $122.3 million for FY 2008. The budget also provides $33.4 million (+$9.5 million) for the Hydrogen Initiative, and $26.1 million (+$3.1 million) for solar energy research. The budget provides increased funding to operate four light sources (+$16 million) and five nanoscale centers (+22.9 million). The BES budget includes $21.5 million as this office takes over SLAC Linac operations from the High Energy Physics budget.

Additional research funding is provided for nanoscale science, hydrogen, solar, and biomass through BES at about $16 million for FY 2008. Construction funding is provided for program engineering and design for the National Synchrotron Light Source II ($25 million), for the Advanced Light Source User Support Building (+$14.2 million), and for new facilities at SLAC (+$7.4 million), offset by completion of the nanoscale centers (-$19 million), and ramp-down of the Linac Coherent Light Source (-$54.5 million).

Advanced Scientific Computing Research is requested at $340.2 million, an increase of $21.5 million (+6.8 percent). The FY 2008 request supports long-term applied mathematic research and the Computational Science Graduate Fellowship program (+$7.4 million) and long-term research in computer science (+$5.1 million). Both Argonne and Oak Ridge National Laboratories will expand operations (+$2.5 million), and additional research will be supported on the next generation of scientific computers (+$4 million), and other research, including high performance network facilities and test beds (+$2.5 million).

Science Laboratories Infrastructure is proposed at $79 million, an increase of $28.1 million to support ongoing projects and resolve pending issues.

Fusion Energy Sciences receive an increase of $108.9 million largely reflecting progress on the International Thermonuclear Experimental Reactor (ITER) to be built in Cardarache, France. The Fusion Energy Sciences program would receive $427.9 million in the FY 2008 budget request.

Workforce Development for Teachers and Scientists is continued at $184.9 million, an increase of $14.1 million (+8.2 percent).

Energy

A total of $3.1 billion is requested to promote America’s energy security through the development of reliable clean sources of energy, an increase of $505.9 million (+19.6 percent) above the FY 2007 requested level. Within this amount, $2.7 billion is associated with the President’s AEI and his Twenty in Ten initiatives to reduce U.S. gasoline usage by 20 percent in the next ten years (by 2017).
Energy Efficiency and Renewable Energy

A total of $1.2 billion is requested for Energy Efficiency and Renewable Energy programs, which represents a $59.8 million (+5.1 percent) increase above the FY 2007 request.

**Biomass and Biorefinery Systems R&D** would receive $179.3 million in FY 2008, an increase of $29.6 million (+19.8 percent). These funds will be focused on R&D to make cellulosic ethanol cost competitive by 2012. Biomass is highlighted as the only renewable source for producing liquid transportation fuels in the near term as the U.S. works to reduce its dependence on foreign oil. Research will be focused on developing a wide range of biomass feedstocks. Work will continue toward construction of a commercial biorefinery demonstration project.

**Hydrogen Technology** would receive $213 million, an increase of $17.2 million (+8.8 percent) above the FY 2007 request level. Additional funding is provided for a total of $309 million in the FY 2008 budget for the Hydrogen Fuel Initiative. This funding completes the President’s five-year, $1.2 billion commitment to begin developing hydrogen fuel cell vehicles and infrastructure technologies.

**Technology Development** programs would receive $308.6 million under the EERE budget request. Vehicle technologies are proposed at $176.1 million, an increase of $10.1 million (+6.1 percent) with focus on plug-in hybrid electric vehicle technology. Building technologies would receive $86.5 million, an increase of $9.1 million (+11.8 percent). Within this program, solid state lighting R&D is proposed at $19.3 million. Industrial technologies are proposed at $46 million, an increase of $435,000 (+1 percent).

**Solar Energy** would receive $148.3 million, which is approximately the same as last year’s budget request, but significantly above the FY 2006 enacted level of $81.8 million. The Solar America Initiative is focused on accelerating the competitiveness of photovoltaic solar electricity in the marketplace by 2015.

**Wind Energy** is proposed for $40.1 million, a reduction of $3.7 million (-8.6 percent below the FY 2007 request, but $1.7 million above the FY 2006 enacted level. Research is focused on reducing costs and overcoming barriers to the large-scale use of wind power.

**Innovative Technology Loan Guarantees** would be financed in the amount of not to exceed $9 billion as authorized in the Energy Policy Act of 2005. The budget includes $8.4 million to set up the office to implement the loan guarantee program. The Administration envisions guaranteeing approximately $4 billion in loans for central power generation facilities, such as nuclear facilities, carbon sequestration coal power plants; $4 billion in loans for biofuels and clean transportation fuels projects; and $1 billion for new electric transmission facilities and renewable power generation systems. Congress is providing initial funding for these loan guarantees in the year-long FY 2007 funding resolution.
Program terminations are proposed for geothermal technology and hydropower R&D as in the FY 2007 budget request. These programs received approximately $23 million in FY 2006.

Fossil Energy Programs

A total of $863.0 million is requested for fossil energy programs, an increase of $214.2 million (+33 percent). Within this amount, $331.6 million would be targeted to the expansion of facilities for the nation’s Strategic Petroleum Reserve to hold 1.5 billion barrels of oil, an increase of $176.2 million (+113.3 percent) above the FY 2007 request level.

Fossil Energy R&D is proposed at $566.8 million, an increase of $97.1 million (+20.7 percent) above the FY 2007 request level, but slightly below the FY 2006 enacted level of $580.7 million. As in last year’s budget, the Administration proposes the elimination of funding for oil and natural gas technologies, which received approximately $63 million in FY 2006.

Coal research would receive a significant $96.5 million increase (+29.2 percent) for a total of $426.6 million. This request completes the President’s commitment to spend $2 billion on clean coal research in seven years, rather than the 10 years originally planned. The FutureGen project would receive $108 million, a doubling of the funding proposed in the FY 2007 budget. These funds would come out of $257 million in clean coal technology funding provided in previous years but not yet expended and deferred into FY 2008. The Administration would close out the clean coal technology program after transferring $58 million of the deferred funding to the Clean Coal Power Initiative.

Nuclear Energy would receive a total of $874.6 million in the FY 2008 budget request, an increase of $242 million (+43.2 percent). The funding increase is for the Energy Supply and Conservation program activities which would receive $801.7 million. As in previous years, the Administration would terminate funding for the University Reactor Infrastructure and Education Assistance program, which was funded at $26.7 million in FY 2006.

Nuclear energy R&D is proposed at $567.7 million, an increase of $220.6 million (+63.6 percent). These funds are targeted to develop new nuclear generation technologies to meet energy and climate goals. Reflecting the international importance of nuclear safety and security, $76 million in funding is also provided through DOE’s other defense activities program.

Within the budget request, $395 million is proposed for the Advanced Fuel Cycle Initiative to develop technologies to reduce the volume and toxicity of high level waste for spent nuclear fuel. The request is $152 million above the FY 2007 budget proposal. The Nuclear Power 2010 program would receive $114 million, an increase of $60 million above the FY 2007 request. R&D toward a Generation IV Nuclear Energy System is
requested at $36.1 million, a $4.7 million increase. The Nuclear Hydrogen Initiative is
proposed at $22.6 million, an increase of $3.9 million above the FY 2007 request.

*Ultra-deepwater and Unconventional Natural Gas Research Fund.* As it proposed in the
FY 2007 budget, the Administration would repeal legislation enacted by Congress as part
of the Energy Policy Act of 2005 that created this program as a mandatory program
financed by federal revenues received from oil and gas leasing activities.

*Electricity Delivery and Energy Reliability*

These programs would be funded at $114.9 million in the FY 2008 budget request, a
reduction of $10 million (-8 percent) below the FY 2007 request. The largest reduction --
$17.3 million – would come from High Temperature Superconductivity R&D – for a
requested level of $28.2 million.

**Department of Defense**

The Department of Defense (DOD) would see its overall Research, Development, Test,
and Evaluation (RDT&E) investment decrease by 1.1 percent in FY 2008 under the
President's request, for a total of $75.12 billion. Within this amount, the accounts of most
interest to university researchers, the so-called “6.1” and “6.2” programs (basic and
applied research, respectively), on the whole would receive even worse treatment under
the request. Overall basic research at DOD would fall by 8.7 percent compared to the
enacted FY 2007 level, and overall applied research programs would be cut by 18
percent. Defense officials point toward the elimination of Congressionally-added
earmarks as an explanation for the cuts in basic and applied defense research, though the
size of the cuts seem to suggest that more than earmarks would be reduced under the
request. Below are the breakdowns by DOD service branch for basic and applied
programs requested in FY 2008:

**Army.** The Army's basic (6.1) research programs would be funded at $305.8 million
under the request, a decrease of 16.4 percent from the final FY 2007 level. The Army's
applied (6.2) research programs would be funded at $686.2 million, a decrease of 43.0
percent from FY 2007.

**Navy.** The Navy's basic (6.1) research programs would be funded at $467.2 million, a
decrease of 5.0 percent, and its applied (6.2) research programs would be funded at
$677.5 million, a decrease of 13.8 percent.

**Air Force.** The Air Force's basic (6.1) research programs would be funded at $375.2
million, a decrease of 8.2 percent. The Air Force's applied (6.2) research programs
would receive $1.01 billion, a decrease of 12.5 percent.

**Defense-wide programs.** Defense-wide programs include all DOD R&D programs
outside of the services branches (e.g., DARPA, Missile Defense Agency, etc.). Defense-
wide basic (6.1) research programs would receive $279.9 million, a decrease of 5.9
percent, while Defense-wide applied (6.2) research programs would receive a decrease of 9.3 percent for a total of $1.98 billion in FY 2008. Within the Defense-wide programs, DARPA would receive $3.09 billion, a decrease of 1.6 percent from FY 2007. The National Defense Education Program (NDEP), which provides scholarships and fellowships to undergraduate and graduate students entering critical fields of science, mathematics, engineering, and languages in return for a commitment of national service, would receive $44.4 million in FY 2008, more than doubling the size of the program with an increase of 128.9 percent.

National Institutes for Standards and Technology

The National Institutes of Standards and Technology, housed within the Department of Commerce, would receive $640.7 million in the FY 2008 budget request, a decrease of $111.32 million or 14.8 percent below the current level.

NIST’s Scientific and Technical Research Services (STRS) would receive $500.5 million, an increase of $105.8 million above the current level. The Construction of Research Facilities (CRF) would receive $93.86 million, a decrease of $79.9 million below the current level.

NIST's Industrial Technological Services (ITS) include funding for the Advanced Technology Program (ATP) and the Hollings Manufacturing Extension Partnership (MEP). This portion of the request reflects the Administration’s desire to eliminate the ITS division of NIST. The request completely eliminates the Advanced Technology Program, currently funded at $78.9 million and reduces the Hollings Manufacturing Extension Partnership to $46.3 million, $58.1 million or 56 percent below the current level.

U.S. Geological Survey

The President proposes a total of $974.9 million for the U.S. Geological Survey (USGS) in his FY 2008 budget for the Department of Interior. The request is $6.8 million or 0.7 percent below the year-long funding resolution for FY 2007. The request includes $17.9 million in program decreases to restore priorities that were in the President’s FY 2007 budget.

The budget includes $5 million for the Healthy Lands Initiative, which will focus on the Green River Basin in Wyoming and help the USGS to develop scientific information, knowledge, and tools to ensure that future decisions regarding land and resource use, management practices, and energy development are based on understanding the relationships of biological resources to physical changes.

$3 million is included in the budget request for the U. S. Ocean Action Plan, which promotes collaboration among private and public partners to improve conservation practices. $1 million of this requested funding will support the USGS hazards initiative.
The hazards initiative was introduced in the President’s FY 2007 budget request to build stronger communities and reduce the vulnerability of at risk populations endangered by the possibility natural hazards. Because the hazards initiative was introduced in the 2007 request, there is no set funding level for it in the joint resolution currently being considered by Congress. However, because it continues to be a USGS priority, the Administration may choose to fund the program in FY 2007, with an additional $1.3 million requested for FY 2008.

The Administration plans to continue activities to restructure its workforce and programs, placing high priorities on maintaining its systems, like the Advanced National Seismic System (ANSS).

**Geography**

The President requests a total of $74.9 million to support land remote sensing and geographic research, an overall decrease of $54.4 million or 42 percent, due largely to the transfer of the Cooperative Topographic Mapping program to the Enterprise Information activity.

**Geologic Hazards, Resource, and Processes**

The Administration’s FY 2007 budget proposes $222.1 million for Geologic Hazards activities, an overall reduction of $13.2 million or 5.6 percent below the year-long funding resolution for FY 2007. A $1.5 million increase is proposed for the Coastal and Marine Geology program to begin implementation of the Oceans Research Priorities Plan and Implementation Strategy.

The reductions come in Geologic Resource Assessment activities where the Administration again proposes to discontinue global mineral resource assessments and data collection on mineral commodities and certain research activities for savings of $22.9 million.

Earthquake hazards would be funded at $52.5 million, $2 million over the year-long funding resolution for FY 2007. The Advanced National Seismic System (ANSS) would be flat-funded at $8.06 million, the enacted FY 2006 level.

**Water Resources Investigations**

The President proposes a total of $212.5 million for USGS water resources investigations, an increase of $700,000 or 0.3 percent above the year-long funding resolution for FY 2007.

The budget request includes an increase of $1.5 million for Hydrologic Networks and Analysis program as part of the U.S. Action Plan to create an interagency National Water Quality Monitoring Network.
As in previous years (and in previous Administrations), the FY 2008 budget request eliminates funding for the 54 Water Resources Research Institutes for savings of $6.4 million. The Administration would provide an additional $250,000 for the National Streamflow Information program to fund new streamgages in southern California.

**Biological Research.**

The overall request for Biological Research activities totals $181.1 million, an increase of $2.6 million or 1.4 percent over the year-long funding resolution for FY 2007. The Biological Research and Monitoring program would gain an increase of $3.4 million.

The budget proposes a $1.5 million reduction for the National Biological Information Infrastructure (NBII) program leaving $22.3 million for Biological Information Management and Delivery.

Cooperative Research Units are supported at $15.4 million, a decrease of $700,000.

**Enterprise Information**

This program would be funded at $112.1 million, a major funding increase of $65.73 million or 142 percent above the year-long funding resolution for FY 2007 due to the transfer of the Cooperative Topographic Mapping activity from the Mapping, Remote Sensing, and Geographic Investigations program to a new National Geospatial Program.

**Science Support**

The President proposes $70.7 million for science support, an increase of $1.4 million or 2 percent above the year-long funding resolution for FY 2007.

**Facilities**

The request of $101.55 million to support USGS facilities is a net increase of $6.8 million or 7 percent above the year-long funding resolution for FY 2007.

**Department of Education**

The President has requested a total of $56 billion in discretionary appropriations for the Education Department (ED) for FY 2008, the same as the FY 2007 request level but approximately $1.5 billion (2.7 percent, based on informal calculations) below the amount included in the House-passed FY 2007 joint funding resolution. Within this amount the request is a somewhat mixed bag for student aid and higher education.

Most notably, the request would increase the maximum Pell Grant to $4600, $290 above the level contained in the House-passed FY 2007 funding resolution and $550 above the FY 2006 enacted level. The request calculates that keeping the maximum at the current $4050 would cost $13.2 billion, and provides this in discretionary funds, while proposing
an additional $2.2 billion in mandatory funds to cover the increased maximum. While there is clearly the will among Congressional Democrats to increase the Pell maximum beyond the $4310 contained in the FY 2007 resolution, it remains to be seen whether they will go along with this hybrid discretionary/mandatory plan.

While the President’s proposed Pell increase is welcome news to the higher education community after years of a stagnant maximum grant, it would be offset by the elimination of the Supplemental Education Opportunity Grant (SEOG), which was funded at $771 million in FY 2006 and the FY 2007 resolution. This is in keeping with observations made by Secretary of Education Margaret Spellings and her Commission on the Future of Higher Education that there are too many federal student aid programs and that some consolidation is in order. In addition, the request would cut subsidies to lenders participating in the Federal Family Education Loan (FFEL) program to help pay for the proposed Pell increase.

Notably, the President has not proposed the elimination of TRIO Upward Bound ($313.6 million), TRIO Talent Search ($142.8 million) or GEAR UP ($303.4 million), instead requesting the current levels as enacted in FY 2006 and contained in the House-passed FY 2007 resolution. In the past, the President had sought to do away with these popular college access programs and roll them into a block grant program for high schools, though Congress perennially restored funding. For FY 2008, the ED budget justification language seems to suggest the Administration is satisfied with recent reviews of these programs and ongoing changes to make them “more effective” (such as ED’s efforts to focus Upward Bound on needier students).

The President does, however, request the elimination of Leveraging Educational Assistance Partnerships (LEAP) ($64.5 million) and the Perkins Loan ($65.5 million for cancellations; the President has also proposed that the Perkins Loan revolving fund be recalled over the next ten years), as in past years. Previously, these proposed cuts had little political traction on Capitol Hill, where the programs remain popular.

In another significant move, the President has requested $25 million in new funds within the National Center for Education Statistics (a division of the Institute of Education Sciences, ED’s research, statistics and evaluation arm) to conduct a pilot feasibility study on the implementation of a “student level data system.” This proposal, which has also been referred to as a “student unit data record,” has drawn criticism on Capitol Hill and elsewhere due to its implications for the personal privacy of students. In fact, previous Higher Education Act (HEA) Reauthorization legislation contained language forbidding ED to implement such a system, but it was never enacted.

Some other notable items in the ED request:

- The request proposes to increase the amount of the Academic Competitiveness Grant (ACG) by 50 percent for both first-year and second-year students. This would bring the first-year grants to $1125 and the second-year grants to $1950. First implemented last year, the merit-based, mandatory ACG program (and its companion, the SMART Grant for third- and fourth-year students studying in
selected fields) has proven difficult to implement, but it remains a favored program of the Administration. In the ED budget request briefing, Under Secretary of Education Sarah Martinez Tucker outlined the Department’s vision of ACG and SMART providing a merit-based compliment to the need-based Pell. ED budget documents highlight how the combination of a Pell Grant and an increased ACG can help a student afford tuition and fees at different types of institutions.

- Federal Work Study would be funded at $980 million under the request, the same as the FY 2006 enacted and FY 2007 resolution level.
- Support for Historically Black Colleges and Universities (HBCUs) ($238.1 million) and Hispanic-Serving Institutions (HSIs) ($94.9 million) would remain at the FY 2006 enacted and FY 2007 resolution levels.
- Title VI International Education and Foreign Language Studies would be level funded at $105.8 million, but the request would create a new $24 million program called Advancing America Through Foreign Language Partnerships as part of the President’s National Security Language Initiative. The President also proposed the creation of this program (which would provide grants to institutions of higher education to partner with K-12 school districts to create continuous language learning programs) last year, but it was not funded by Congress.
- Within IES, the request would provide $162.5 million for the National Center for Education Research and $71.8 million for Special Education Research, roughly the same as the FY 2006 enacted and FY 2007 resolution levels. The National Center for Education Statistics would receive $119 million, an increase of $29 million (32 percent) above the FY 2006 enacted and FY 2007 resolution level, with $25 million of that amount dedicated to the aforementioned data system pilot study. The request would provide the National Center for Education Evaluation with $116 million, an increase of $23.5 million (25 percent) above the FY 2006 enacted and FY 2007 resolution level. These new funds would all go towards implementing state-level assessments at the 12th grade level. Finally, the request includes $49.2 million for statewide educational data systems, the same as the FY 2007 requested amount but double the FY 2006 enacted and FY 2007 resolution level.
- The request proposes raising the student loan limit for juniors and seniors by $2000 to $7500, as well as increasing the aggregate loan limits for all students. Budget documents estimate a cost of $1.1 billion over five years to enact this proposal.
- Both Graduate Assistance in Areas of National Need (GAANN) ($30.1 million) and the Javits Fellowship ($9.8 million) would be funded at roughly the FY 2006 enacted and FY 2007 resolution levels.