

## SCIENCE POLICY

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### White House Announces FY 2005 Budget Request for R&D

On February 2, President George W. Bush announced his fiscal year 2005 budget request, in which he stressed keeping non-defense, non-homeland-security federal spending growth to under 1% (less than the administration's expected rate of inflation of 1.3%). The budget request commits 13.5% of total discretionary outlays, to research and development (R&D), with 5.7% allocated to non-defense R&D. Out of a total FY 2005 R&D request of \$132 billion, the request for basic research is \$26.8 billion—95% of which occurs outside the Department of Defense. The administration particularly highlighted the initiative on nanotechnology (\$1 billion) and on hydrogen fuel (\$228 million). For the government departments and agencies funding materials research, the administration requested \$5.75 billion for the National Science Foundation (NSF), \$3.4 billion for the Department of Energy's (DOE) Office of Science, and \$482 million for the National Institute of Standards and Technology (NIST) within the Department of Commerce. Amid various incentives to help create jobs and spur the economy, President Bush proposed making the research and experimentation tax credit permanent.

Within the R&D budget proposed for NSF, \$1.1 billion is committed to the Directorate for Mathematical and Physical Sciences, an increase of \$23.99 million, or 2.2%, over the FY 2004 estimate of \$1.09 billion. Out of the request for NSF, \$253.18 million is requested for materials research, which is about 0.9% over the FY 2004 estimate of \$250.89 million (FY 2003 actual was \$241.39 million). Enhancements proposed for materials research

include \$90.95 million for the nanoscale science and engineering priority area, designated to support new individual investigator awards and focused research groups, and up to three new Materials Research Science and Engineering Centers (MRSECs). Support is expected for research and education at the interface of materials, the biosciences, and bioengineering. Up to \$3.0 million in additional funds is allocated to support new mid-scale research resources, including synchrotron and neutron beam lines whose cost and scope is beyond that of the NSF Major Research Instrumentation program. This amount includes up to \$2.50 million to support beam-line instrumentation at the DOE Spallation Neutron Source (SNS). The National Nanotechnology Initiative within NSF is to be funded at \$305 million, a 20% increase over 2004. The agency also wants to provide graduate fellowships and traineeships to 5500 graduate students across the country.

For DOE, the budget request includes increases in priority areas such as nanotechnology, targeted hydrogen and fuel-cell research, national scientific user facility operations, and initial funding for the development of a new x-ray laser light source located at Stanford University. With this proposal, DOE wants to fund basic research to overcome key technology hurdles in hydrogen production, storage, and conversion by seeking breakthroughs in areas such as non-precious-metal catalysts, high-temperature membrane materials, multifunctional nanoscale structures, biological and photoelectrochemical hydrogen production, and precision manufacturing processes. Most of the 2005 allocation for the Office of Science is new funding and represents a significant

expansion of basic research on hydrogen-related topics, according to the president's Office of Science and Technology Policy (OSTP). The Hydrogen Fuel Initiative, according to OSTP, will fund research on hydrogen production from renewable energy, coal, nuclear energy, and biomass sources; safe and effective hydrogen storage systems; and affordable hydrogen fuel cells for consumer automobiles. Another priority for DOE is \$38 million for the International Thermonuclear Experimental Reactor (ITER) fusion energy project.

The FY 2005 proposal for NIST reflects a 20% increase over FY 2004 enacted. The proposal includes \$15.6 million to support advances in key manufacturing areas, including nanomanufacturing research, nanometrology for the electronics and semiconductor industries, advanced medical technologies, and measurements and standards for international trade, and to create a national nanofabrication and nanometrology user facility. For capability improvements at the NIST Center for Neutron Research, \$8.3 million is proposed to expand the facility's collaboration with industrial, government, and academic researchers in materials science, biotechnology, chemistry, engineering, and physics.

The administration proposes to terminate the Advanced Technology Program (ATP) because it believes that other NIST R&D programs are more effective and necessary in supporting the fundamental scientific understanding and technological needs of the country. The 2005 budget proposal maintains the 2004 level of funding for the Manufacturing Extension Partnership (MEP). MEP was designed to demonstrate how to provide information and consulting services to help businesses adopt advanced manufacturing technologies and business practices and transfer these methods, activities, and functions to the private sector.

Immediate Congressional reaction to the budget request was negative. House Science Committee Chair Sherwood Boehlert (Rep-N.Y.) expressed disappointment and pledged to work with the administration and Congress to "improve the numbers." In a statement issued on February 2, Boehlert said, "After a few years of spending at the levels proposed in this budget, science would be an emaciated, old, grey mare, unable to produce any new ideas or young scientists."

On a positive note, Boehlert is pleased with the increase over 2004 numbers for NIST laboratories. "Restoring funding to those labs will be one of my top priorities this year," he said. Boehlert also praised the administration's interagency R&D initiatives.

**Table I: Fiscal Year 2005 Budget Request.\***

(In millions of U.S. dollars)

	Actual 2003	Estimate 2004	Estimate 2005
<b>National Science Foundation</b>			
Research and related activities	4,069	4,251	4,452
Education and human resources	903	939	772
Major research equipment and facility construction	149	155	213
<b>NSF Subtotal</b>	<b>5,121</b>	<b>5,345</b>	<b>5,437</b>
<b>Department of Energy</b>			
Science and technology	3,296	3,484	3,432
<b>National Institute of Standards and Technology</b>			
Scientific and technical research and services	357	337	423
Industrial technology services	285	209	39
Construction of research facilities	66	64	59

\*Extracted from the FY 2005 budget request posted on the Web site of the Office of Management and Budget ([www.whitehouse.gov/omb/](http://www.whitehouse.gov/omb/)).

Preliminary analysis by the American Association for the Advancement of Science also demonstrated concerns over the lack of increased funding proposed for agencies other than DHS and DoD. Updates in the AAAS analysis can be accessed at Web site [www.aaas.org/spp/rd](http://www.aaas.org/spp/rd).

Some of the R&D highlights in the proposal are shown in Table I. Budget information came from the news services of the White House, the Office of Management and Budget, OSTP, NSF, DOE, and NIST.

### South Korean Government to Bring Jobs to Science Sector

The South Korean government plans to create more than 10,000 new jobs by 2007 for students majoring in engineering and sciences, the Ministry of Science and Technology announced in early February. The ministry will launch an "employment quota" for engineering and science majors this year, Science Minister Oh Myung said during a New Year's policy briefing to

President Roh Moo-hyun. According to the science minister, the plan will require government-funded companies and research centers to recruit a certain number of graduates from engineering and science programs. The government also plans to raise the number of technology-related positions for this year's public officer recruitment program.

The plan is expected to raise the portion of such positions at the assistant director level to 26.8% this year from 23.5% last year, ministry officials said. According to the ministry, the government aims to push up the portion to 50% by 2013. The moves will reflect the government's pledge to develop the science and engineering sector. During a New Year's news conference on January 14, President Roh said that the administration would make every effort to build a "technology innovation system."

But some scholars are showing a cautious reaction to the government's new

policies. Park Sang-kyu of the Engineering Department at Hanyang University said that forcing businesses to hire more engineering and science majors will not work well in the long run.

"Still, many Koreans believe that researcher or engineering jobs are relatively poorly paying. The government should take actions to boost rewards and incentives for research and development activities," he said.

The science ministry plans to streamline its administration to transform itself into a central office that governs all science-related policies. To this end, the ministry will ask other government departments to transfer their science-related issues. In order to improve efficiency, the ministry will also move its work on applied science research activities to other departments.

### Ireland's Budget and Estimates for 2004 Encourage Development of Knowledge-Based Economy

The Irish Council for Science, Technology, and Innovation (ICSTI) welcomed, on December 4, 2003, a number of the measures in the country's Budget and Estimates for 2004 as further encouraging the development of Ireland as a knowledge-based economy. In July 2003, the council published its State Expenditure Priorities for 2004, in which it set out its recommendations for science and technology investment and promotion, including measures to sustain the development of the national science and technology infrastructure and to increase the innovation performance of the industrial base. The council particularly welcomed measures to promote research and development (R&D) in industry and high technology and innovation-based activities such as introducing a 20% tax credit to companies for incremental R&D expenditures. To sustain the development of the national science base, the Department of Enterprise, Trade, and Employment set funding for the Science Foundation Ireland at €113.7 million and for Enterprise Ireland for applied and in-company research at €82.8 million.

Edward Walsh, chair of ICSTI, said, "Our future prosperity depends on making Ireland attractive for knowledge-driven enterprise and on making our engineering, science, and research capability stronger and more sophisticated. I am pleased that the budget gives effect to a number of initiatives recommended by ICSTI."

The council said the announced measures should maintain the good progress and momentum achieved under the National Development Plan over recent years toward establishing Ireland's reputation as a center for world-class research. □

### Government Science Appointments

The Office of Science and Technology in the United Kingdom has announced the appointment of Sir Keith O'Nions FRS as Director General of Research Councils (DGRC). Succeeding John Taylor as director general, O'Nions began his appointment on January 1, 2004, initially on a part-time basis. He is currently chief scientific advisor at the Ministry of Defense. O'Nions has been a professor of physics and chemistry of minerals and head of the Department of Earth Sciences at the University of Oxford since 1995.

Erich Weigold, scientist and creator of electron momentum spectroscopy, has been appointed to the position of Australian Research Council Executive Director for Physics, Chemistry, and Geoscience. With extensive experience in research and administration in Australia and elsewhere, Weigold has been at the forefront of research in atomic and molecular physics and, more recently, solid-state physics and nanomaterials. Weigold succeeds astronomer Lawrence Cram, who served as executive director for three years.

### Academy of Finland in Search of New Centers of Excellence

The Academy of Finland is set to launch its third Center of Excellence program in 2006, following two previous national programs that were started in 2000 and 2002. The Academy will be appointing the new Centers of Excellence in research in 2005, provided that funds are made available by the Finnish Parliament in its 2005 budget.

The national Center of Excellence strategy is based upon the Finnish science policy objective of maintaining and raising the goals and quality standards of Finnish research and strengthening its international competitiveness.

Centers of Excellence are research or researcher training units consisting of one or more high-level research groups that share a clear set of common objectives and work under the same management. A Center of Excellence may be a unit operating within a university or research institute, or in collaboration with a university or research institute in the private sector, or an assembly of units working in several different organizations.

In the new Center of Excellence program, special attention will be given to new and challenging openings, multidisciplinary and interdisciplinary approaches, systematic and long-term international research cooperation among research groups, and the promotion of young researchers' careers.

The application process involves two stages. Plans of intent must be filed with the Academy of Finland by **August 16, 2004**. Afterward, the Academy's Board will select a short list of applicants to submit more detailed plans and applications. Further details can be obtained from Web site [www.aka.fi/](http://www.aka.fi/) or by contacting Development Manager Ritva Dammert, tel. 358-9-7748-8237, e-mail [ritva.dammert@aka.fi](mailto:ritva.dammert@aka.fi).