

Overlapping Federal Budgets Confuse the FY 2004 R&D Funding Picture

Defense programs and physical sciences see increases in the administration's fiscal year 2004 budget proposal, but much of the rest of science funding is flat or down.

Office of Science and Technology Policy Director John Marburger stepped before a crowd of Washington insiders gathered for the early February unveiling of the administration's fiscal year 2004 research and development budget proposal and noted, with a slight smile, that "some astute observers may have noticed that many of the 2003 appropriations bills have not passed in Congress." Then came the understatement: "That makes it difficult to make comparisons [with the 2004 proposal]."

At the end of the hour-long briefing by Marburger and Office of Management and Budget Associate Director Marcus Peacock, another OMB analyst noted that the FY 2004 budget had "lapped" the FY 2003 budget. Peacock, who oversees many of the science and technology funding proposals for the administration, observed that four separate federal budgets were in play in Washington. The government was operating on congressional continuing resolutions that essentially have kept the FY 2002 budget in effect, even though FY 2002 ended last 1 October. The FY 2003 appropriations bills have been tied up in congressional wrangling. The administration released its FY 2004 proposal as required on 3 February, but because final FY 2003 numbers upon which the FY 2004 proposal is based hadn't been determined, the new numbers didn't mean much. "And next week, I go to a meeting to start on the FY 2005 budget," Peacock said with a smile that matched Marburger's.

Across Washington, officials at most federal agencies offered similar cautions as they released their parts of President Bush's new budget proposal. The FY 2004 numbers are an indication of what the administration is thinking, but because there is no FY 2003 final budget baseline, finding fiscal reality in the FY 2004 budget is nearly impossible. Only the FY 2003 budgets for the Department of Defense (DOD) and for Military Construction have been enacted by Congress. All of the other budget comparisons are be-

tween what the administration proposed in FY 2003 and is proposing in FY 2004. In many agencies and programs, what the administration proposed will be substantially changed when and if Congress completes the FY 2003 budget.

Uncertainty comes not only from the overlapping budget numbers, but from: the fiscal squeeze caused by a near-record deficit of \$307 billion projected for FY 2004; the estimated multibillion cost of a war on Iraq that isn't factored into the budget proposal; and the anticipated reformulation of NASA's budget in the wake of the space shuttle Columbia catastrophe. Indeed, NASA postponed its scheduled FY 2004 budget briefing on 3 February until the financial ramifications of Columbia's loss can be determined.

All of these issues caused the R&D budget experts at the American Association for the Advancement of Science to note that this year their analysis of the federal R&D budget is "especially preliminary." The AAAS budget overview says "the budget proposes overall increases for the federal investment in R&D, especially for the priorities of defense development and homeland security research, with a mixture of flat funding, cuts, and modest increases for other R&D programs."

Budget priorities

OMB's Peacock and other administration officials are defining the underlying budget priorities as "winning the war against terrorism and protecting the homeland, and strengthening our economy." In the section on R&D funding in the thick FY 2004 budget book, the administration notes that "these priorities have affected the way R&D is being funded and directed, as well as the way the results of R&D are being used. Within the federal government's research portfolio, agencies are directing many of their programs to assist in the defense effort."

What that means, according to the AAAS analysis, is that while the request for total federal R&D spending

is a record \$122.7 billion for FY 2004 (a 6.7% increase over the FY 2003 request), most of the money would go to defense programs. Once DOD and Department of Homeland Security funds are subtracted, "the other R&D funding agencies would see their increases clustered around the 1.9% inflation rate, with increases for some programs matched by flat funding or cuts in others."

Administration officials emphasized increases in "priority programs" in presenting the R&D budget, noting that, as Marburger put it in his briefing, the "important numbers" are for those programs. They include big weapons systems at the DOD. The missile defense program would jump 22%, to \$8.3 billion in FY 2004, compared to FY 2003. The Joint Strike Fighter would get \$4.4 billion in development money, up 28% from FY 2003. But both basic and applied research in defense would drop significantly, with basic falling 7.7% to \$1.3 billion, and applied declining 14.4% to \$3.7 billion.

Keeping the "especially preliminary" warning in mind, highlights from other science and technology agencies are:

► **National Science Foundation.** The NSF FY 2004 budget would total \$5.5 billion, a respectable 8.6% increase, but significantly less than the \$6.4 billion authorized in a bill signed by the president a few months ago. The FY 2004 budget focuses on the physical sciences and proposes a 12.7% increase to \$1.1 billion. The Major Research Equipment and Facility Construction account would go from \$126 million to \$202 million, with much of that money aimed at the Atacama Large Millimeter Array, the IceCube Neutrino Observatory, and the EarthScope seismic program.

► **National Aeronautics and Space Administration.** While NASA's budget is likely to be reallocated due to the Columbia disaster, space science R&D would receive a 17% increase to \$4 billion under the initial FY 2004 proposal. Included in that is money for developing a nuclear propulsion system, and missions to Pluto and the Kuiper Belt, Mercury, the asteroids, and a comet. There is also \$59 million for the Laser Interferometer Space Antenna (LISA) and

for CON-X, a next-generation telescope that could image emissions from black holes.

► **Department of Energy.** Research and development funding at DOE would increase 5.7% to \$8.5 billion, but most of that would go to defense activities. Funding for the Office of Science would remain flat at \$3.3 billion. There would be a significant boost in funding for nanoscience with the reallocation of money that has been going for construction of the nearly completed spallation neutron source.

► **NIST and NOAA.** The National Institute of Standards and Technology would see its R&D budget decline 11.8% to \$411 million. NIST's Advanced Technology Program would only receive enough money to close out contracts as the White House tries once again to kill the program. The National Oceanic and Atmospheric Administration's R&D budget would fall by 6.4% to \$764 million.

► **Department of Homeland Security.** This department, officially created in January, would become a significant funding agency with a proposed R&D budget of \$1 billion. Most of that money would be in the Directorate of Science and Technology. The directorate would have \$801 million, which would include the Homeland Security Advanced Research Projects Agency (HSARPA).

► **National Institutes of Health.** After five years of appropriations that nearly doubled the NIH budget, the agency would receive only a 2% increase in FY 2004. NIH's National Institute of Allergy and Infectious Diseases, seen as important in the war on terrorism, would receive an 8.9% increase, but overall R&D would rise only 2% to \$27 billion.

While the administration is promoting the substantial increases in its "priority programs," House Science Committee Chairman Sherwood Boehlert (R-N.Y.) described the overall science and technology budget as "disappoint-

US Plans to Rejoin ITER Collaboration

President Bush, heeding recommendations from the fusion science community, the National Research Council (NRC), and the Department of Energy (DOE), authorized the US to rejoin the International Thermonuclear Experimental Reactor project. In a 30 January statement issued by the White House at the same time Secretary of Energy Spencer Abraham was announcing the ITER decision at the Princeton Plasma Physics Laboratory, Bush said, "The results of ITER will advance the effort to produce clean, safe, renewable, and commercially available fusion energy by the middle of this century."

The decision is an apparent victory for Ray Orbach, director of DOE's Office of Science, who has pushed hard for several months to get the administration to rejoin ITER. In a 3 February briefing announcing the president's proposed fiscal year 2004 budget, Orbach described fusion as an "energy source with unlimited amounts of potential" that could produce both electricity for commercial use and, as a byproduct, hydrogen that could fuel the hydrogen-powered "freedom car." The administration has proposed spending more than \$720 million on R&D over five years to create the car.

In presentations last fall to the NRC's burning plasma assessment committee and DOE's independent Fusion Energy Sciences Advisory Committee (FESAC; see PHYSICS TODAY, November 2002, page 28), Orbach said the development of commercial fusion power was critical to help solve the global warming problem. President Bush and other administration officials don't share Orbach's alarm over global warming, however, and instead have tied the ITER decision to the hydrogen car development program.

Citing ITER's estimated cost of \$10 billion, the US dropped out of the project in 1998. ITER was then scaled back to a projected \$5 billion, which the administration deemed reasonable. The US expects to pay about 10% of the construction costs, or about \$500 million over eight years. For the moment, administration officials are talking about a US cost of \$50 million per year, but FESAC has estimated the US cost for becoming a full member to be about \$100 million per year. In his budget briefing, Orbach said the difference in the two amounts is tied to distinctions between construction costs and operating costs. Construction isn't expected to begin until at least 2006, he said, "so the really heavy expenditures are not in this year or even next, but in the ensuing years." The earliest that ITER is expected to become operational is 2014. In the FY 2004 budget, the administration is asking for \$12 million for "ITER negotiations and supporting R&D."

"Remember that all we've done so far is to rejoin the negotiations," Orbach said. "There are still going to be issues of site selection, the issues of what we will build, and so on. The \$12 million will help us in those negotiations." Orbach said other US fusion programs would continue, but those involving burning plasma would be refocused to better support the ITER initiative.

ITER's current partners—Canada, the European Union, Japan, and Russia—have indicated that they expect to choose the ITER site by 2004. Proposed sites are in Canada, Europe, and Japan. China is also seeking to become a partner in ITER.

Jim Dawson

ing." The administration "has acknowledged the importance of funding for basic research, particularly in the physical sciences," he said. "On the other hand, many science programs do not even keep up with inflation. In many areas . . . there aren't enough de-

tails yet to fully understand the proposals," Boehlert concluded. "Perhaps the best that can be said is that this budget document may have to be rethought in any event once Congress finally provides domestic appropriations for fiscal 2003." **Jim Dawson**

L'Oréal and UNESCO Award Women Physicists \$500 000

Not just cosmetic: L'Oréal and UNESCO are rewarding five women from around the globe for their scientific contributions in crystallography, disordered materials, scaling laws of fluids and complex systems, and electron microscopy of crystals and quasicrystals.

This year's "for women in science" awards by cosmetics giant L'Oréal and the United Nations Educational, Scientific and Cultural Organization (UNESCO) recognize lifetime achievements by women in condensed matter sciences. The awards are in their fifth

year, but this is the first time they've rewarded work in the physical sciences. The awards were also increased fivefold this year, with five women from five continents each receiving \$100 000.

"It seems to me that giving due

recognition to women scientists can create a useful psychological shock," Nobel laureate Pierre-Gilles de Gennes, who served as president of the awards committee, said in a statement when the winners were selected. Women are "often more perceptive" than men and they "know how to stand by" someone whose morale is flagging, de Gennes said of women in their capacity as research group leaders. "Men are not so good at this." He added that "women know better than