

Clinton Proposes a Budget Bonanza for Science, Exceeding Expectations and Outdoing Congress

It was surprising to see Harold Varmus, director of the National Institutes of Health (NIH), and Bob Cabana, the astronaut tapped to command the first assembly mission to the international space station, at the side of Hillary Rodham Clinton in the House gallery for the State of the Union message on 27 January. It was also surprising that her husband didn't mention Varmus or Cabana, who seemed to be there to emphasize topics in his text. But the biggest surprise came near the end of President Clinton's 72-minute speech, when he told Congress that his budget request for fiscal 1999 would contain the largest funding increase in history for NIH and the National Science Foundation (NSF).

In Clinton's proposal, funding for those and other R&D agencies are wrapped into a neat package, the \$31 billion 21st Century Research Fund, which would boost the budgets of virtually every agency, with the exception of NASA, in the fiscal 1999 budget, which goes into effect on 1 October. Out of a total Federal R&D budget of \$78.2 billion, or 2.6% more than the current year, the request for nondefense science and technology would total \$37.8 billion, a 5.8% increase—well above this year's expected 2% rate of inflation. Defense R&D in Clinton's 1999 budget request to Congress would decline 0.3%, to \$40.3 billion, accounting for 52% of total R&D funding, but Defense Department allocations for basic research (known in Pentagon jargon as "6.1 items") would rise \$69 million, or 6.6%, to \$1.1 billion, while applied research would increase by 5%, to \$3.1 billion.

Larger increases would go to the civilian research agencies. NIH would receive a boost of 8.1%, to \$14.2 billion, and NSF's budget would jump 10%, to a record \$3.8 billion, with its research and related activities receiving \$2.9 billion, an increase of \$286 million or 11% above the current appropriation. The Department of Energy (DOE) would obtain significant increases for both defense and nondefense R&D. DOE's total R&D budget of \$7.2 billion would represent a \$697 million or 10.8% increase over its funding for the current fiscal year. The department's nondefense research budget would be 11.1% higher, equaling the entire NSF request at \$3.8 billion. The increase

would be divvied up among several projects. One of these amounts to \$157 million to start construction of the National Spallation Neutron Source, a \$1.3 billion accelerator for research on materials and chemical, biological and medical sciences. This neutron source will be built at Oak Ridge National Laboratory with the assistance of scientists and engineers at Lawrence Berkeley, Brookhaven and Los Alamos labs. Another project calls for DOE to put up \$65 million as an installment on its \$450 million contribution, over eight years, to the Large Hadron Collider being built at CERN, near Geneva, Switzerland. DOE also would increase R&D for technologies that are likely to reduce greenhouse gas emissions and improve energy conservation.

The 1999 budget would increase DOE's defense R&D by \$421 million, to \$6.1 billion, largely because of sig-

nificant increases for the science-based stockpile stewardship program, which focuses on maintaining the safety and reliability of nuclear weapons under the Comprehensive Test Ban Treaty (see page 24 for an article on the subject). One key component of the program is the National Ignition Facility, which would receive \$291 million for continued construction at Lawrence Livermore National Laboratory. Another component is the Accelerated Strategic Computing Initiative, for which \$331 million is proposed in fiscal 1999, to develop machines that by 2004 will be 1500 times faster than the fastest available only two years ago.

Only NASA, among the big R&D agencies, would be cut back. Its R&D budget would drop by 2.6%, to \$9.5 billion, the sixth decline in as many years. Development of the international space station would fall from

FY 1999 R&D Budget Highlights: Many Winners and Some Losers

	1997 actual	1998 enacted	1999 request	Percent change
	(millions of dollars)			
National Science Foundation	3 298.8	3 429.0	3 773.0	10.0%
Research and related activities	2 433.9	2 545.7	2 846.8	11.8%
Major research equipment, including LIGO ¹	76.1	109.0	94.0	-13.8%
Education and human resources	619.1	632.5	683.0	8.0%
Salaries, expenses and inspector general	139.6	141.8	149.2	5.2%
Department of Energy	16 547.1	16 560.6	18 034.6	8.9%
High energy physics, including LHC ²	658.2	679.7	691.0	1.7%
Nuclear physics	310.0	320.7	332.6	3.7%
Basic energy sciences, including SNS ³	642.7	667.3	836.1	25.3%
Fusion energy sciences	219.4	229.7	228.2	-0.7%
Biological and environmental research	380.2	405.9	392.6	-3.3%
Weapons activities, including stockpile stewardship	3 914.6	4 149.3	4 500.0	8.5%
Other weapons activities, including nonproliferation	1 633.2	1 644.8	1 687.2	2.6%
National Aeronautics and Space Administration	13 709.0	13 640.0	13 470.0	-1.2%
Space science	1 969.3	2 033.8	2 058.4	1.2%
Earth science	1 361.0	1 417.3	1 372.0	-3.2%
International space station	2 148.6	2 351.3	2 270.0	-3.5%
US-Russian cooperation and program assurance	230.0	137.0	3.0	-98.0%
Department of Commerce				
National Institute of Standards and Technology	565.0	672.9	715.0	6.3%
Core program of research and measurement	265.0	268.9	286.3	6.5%
Advanced technology program	218.0	192.5	259.9	35.0%
Manufacturing extension partnership	95.0	113.5	106.8	5.9%
National Oceanic and Atmospheric Administration	1 996.0	1 993.0	2 009.0	0.8%
Department of Defense				
Basic research	1 031.9	1 041.8	1 111.2	6.7%
Applied research	2 821.8	2 996.0	3 019.9	0.8%
Defense Advanced Research Projects Agency	2 069.9	2 040.8	2 039.7	-0.1%
Ballistic Missile Defense Organization	3 760.3	3 281.7	3 178.9	-3.2%

¹LIGO (Laser Interferometer Gravitational Observatory) construction will be fully paid in FY 1998; \$20 million is requested for instrumentation in FY 1999.

²DOE's funding for LHC (Large Hadron Collider at CERN) increases from \$35 million in FY 1998 to \$65 million in FY 1999.

³Construction of SNS (Spallation Neutron Source at Oak Ridge National Laboratory) begins in FY 1999 at a level of \$157 million.

\$2.5 billion this year (if funding transfers from other accounts are approved) to \$2.3 billion next year. NASA Administrator Daniel Goldin shrugged off the funding disparities among the agencies, saying his agency's efforts to operate more efficiently allowed it to fully support all key aspects of its strategic plan. "I am proud that NASA doesn't have to ask for more funds," he told reporters at a budget briefing. "Our time will come."

Some space scientists and members of Congress are irked that the 1999 budget assumes NASA will be able to transfer \$200 million from infrastructure and science accounts to pay for space station overruns. Congressional leaders have said for months that they will not approve such a transfer, and many scientists are certain that the money is already being taken from research grants.

"The President seems to be throwing money everywhere but NASA," said Dana Rohrabacher, a California Republican who heads the House space subcommittee.

Historic commitment to R&D

At a White House briefing on 2 February, when the budget was released, Vice President Al Gore declared that the proposed R&D budget marks "the largest commitment to key civilian research in the history of America." What's more, he noted, under the Clinton Administration's plan, civilian R&D would continue rising through 2003 to \$170 billion. "This would have been considered unthinkable only a few short years ago."

Indeed, the science community couldn't conceive of such generosity when Clinton and Gore came to power in 1993. The new Administration's priority then was technology, not science. Its principal initiative was the Advanced Technology Program (ATP) at the Department of Commerce, which was supposed to provide as much as \$1 billion per year for researchers at the National Institute of Standards and Technology to assist commercial companies in transforming the science base into marketable products that the firms considered too risky to fund on their own.

The Clinton White House believed that science was already yielding innovative bangs for the bucks that government agencies invested through research universities and national laboratories. Clinton's plan for supporting technology often followed widely heralded Japanese or German models, with their heavy reliance on direct or indirect support for high-risk technologies. In most cases, those models proved unsuccessful. The Clinton Administration's plan was frustrated by Congress, which argued that it repre-

sented inappropriate intervention by government in picking winners and losers.

With the exception of government-industry technology programs, the Clinton Administration's R&D strategy has been typified by small budget increases, more or less in line with inflation rates. After taking control of Congress in 1995, the Republican majority discovered that support of research was popular in business circles and among scientists, engineers and educators, as well as the wider public. John Porter, an Illinois Republican, was praised by House colleagues and corporate leaders for raising NIH's budget from his chair on the appropriations subcommittee that allocates funding for biomedical research. Others, including House Speaker Newt Gingrich of Georgia and Science Committee chairman James Sensenbrenner Jr. of Wisconsin, jumped on the science funding bandwagon.

A parallel awakening stirred Republicans in the Senate. Last year, a group led by Phil Gramm of Texas and Bill Frist of Tennessee, clamored for larger budgets for research. This quickly developed into a bipartisan movement, with Democrats Joe Lieberman of Connecticut and Jay Rockefeller of West Virginia in the fore.

As recently as last November, Jack Gibbons, Clinton's science adviser, and Franklin Raines, director of the White House Office of Management and Budget (OMB), dismissed as unrealistic Congressional calls for R&D increases. They pointed to the 1993 agreement between Congress and the President to slow the growth of entitlements, raise taxes on the wealthiest 1.2% of the population and extend the "caps" on discretionary spending. Last spring, the President and Congress agreed to achieve a balanced budget by 2002. Under those strictures, OMB informed most agencies that their 1999 budget would be essentially flat.

But a series of events last fall convinced Clinton and Gore, as well as Gibbons and Raines, that research was not only politically popular but economically possible. One factor was the unexpected tidal wave of letters, phone calls and e-mail messages to the White House and members of Congress from scientists and engineers, who were mobilized by their professional societies last year to let their political leaders know of their support for higher R&D budgets. A Coalition for National Science Funding, consisting of more than 40 research universities, reinforced the call by many scientific societies, including the American Physical Society, the American Chemical Society and the American Geophysical Union, to raise

the budget for NSF by 10%. MIT president Charles Vest lobbied relentlessly for higher R&D allocations, and his arguments were backed unexpectedly by industrial tycoons such as Lou Gerstner of IBM and Norman Augustine of Lockheed Martin. Even the National Association of Manufacturers promoted the idea that the health of R&D made good sense for the nation.

Christmas gift to science

By Christmas, the White House concluded that the political appeal of higher R&D budgets gained credibility when the booming economy and the record tax receipts it generated were placed in the equation. Indeed, in the past few years, Federal tax revenues have risen sharply, from 18.8% of GDP in fiscal 1995 to 19.8% in 1997. Awash in unanticipated cash, Clinton could not miss balancing the budget. His Christmas gift to science was his 1999 budget proposal.

In presenting his budget, Clinton predicted that the deficit this year would fall to less than \$22 billion—a virtual rounding error in a total budget of \$1.73 trillion—and that the 1999 budget would be balanced three years ahead of schedule. The budget was last balanced in 1969. The last time a President even proposed a budget he claimed would be in balance was in 1971, when Richard Nixon sent his to Capitol Hill, but Congressional and economic facts of life thwarted his intentions.

Reactions to Clinton's budget were cautiously optimistic. "I am pleased that [the President] has joined Congress in recognizing the need to adequately invest in scientific research," said Sensenbrenner. "Optimism is tempered, however, by President Clinton's need to invest in a lot of programs. While I support increasing the Federal budget for science, I believe new money must be justified with a coherent, long-term science policy that is consistent with the need for a balanced budget." Sensenbrenner noted that last year's balanced-budget agreement put rigorous limits on discretionary spending, which includes all R&D budgets. "Within the 1999–2002 time frame, any large increases in Federal R&D will be difficult and can only come at the expense of other popular government programs," said Sensenbrenner.

Still, Robert Reischauer, a Brookings Institution economist who usually detects flaws in the Administration's fiscal policies, complimented Clinton's R&D budget. "It is politically strong and fiscally responsible," said Reischauer, who headed the Congressional Budget Office until last year. No mean achievement on both counts.

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