

NSF R&D Up By 5.5 Percent; Large Increase for IT Research

(The complete series of AAAS R&D Funding Updates, including continually updated analyses of R&D by agency in FY 2000 appropriations, is available on the AAAS R&D Web Site (<http://www.aaas.org/spp/R&D>) in the "FY 2000 R&D" or the "What's New" sections.)

(Revisions in [])

[On October 20, President Clinton signed into law an FY 2000 VA-HUD appropriations bill (HR 2684) that gives increases to R&D programs in the National Science Foundation (NSF).] The final bill closely follows the Administration request and the Senate version of the bill, and rejects the cuts to NSF's budget proposed in the House version. The bill **boosts NSF's budget by \$202 million or 5.4 percent to near the Administration's requested level of \$3.9 billion**. NSF's directorates receive increases of at least 3 percent in the final bill, and total **NSF R&D climbs 5.5 percent to \$2.9 billion** (see Table). Included in the bill is a 31 percent increase for information technology research in the Directorate for Computer and Information Science and Engineering (CISE) for research in areas similar to the Administration's proposed Information Technology for the Twenty-First Century (IT²) initiative.

Although FY 2000 started on October 1, Congress is still struggling to draft the 13 appropriations bills within discretionary spending caps that are forcing sharp cuts to domestic discretionary programs. The discretionary spending caps, enacted in 1997, require FY 2000 discretionary spending to be nearly \$20 billion below FY 1999 funding levels. Thanks to several accounting maneuvers, including billions of dollars in rescissions of unspent housing funds, designations of emergency spending for disaster relief, and advance appropriations of FY 2001 funds, the final VA-HUD bill manages to stay within tight budget totals while still providing increases for priority programs.

Within the \$70 billion discretionary total for the final VA-HUD bill, Congress provided NSF with just \$9 million less than its request, for a total NSF budget of \$3.9 billion, an increase of \$202 million or 5.4 percent over FY 1999. **NSF's R&D funding, which excludes NSF's education and training activities and overhead costs, totals \$2.9 billion in FY 2000, an increase of \$150 million or 5.5 percent (see Table).**

The **Research and Related Activities (R&RA)** account, which funds most of NSF's R&D, receives \$3.0 billion, 5.6 percent or \$157 million above the FY 1999 funding level but \$38 million below the request. Each directorate receives an increase of at least 3 percent.

The final VA-HUD bill dramatically increases NSF's investments in information technology (IT) research. The Clinton Administration, in its budget request, had proposed a multi-agency **Information Technology for the 21st Century (IT²)** initiative in fundamental computing and IT research with a \$366 million budget for FY 2000, of which \$146 million would have come from NSF. Of that amount, NSF requested \$110 million for IT² research in the **Computer and Information Science and Engineering (CISE)** Directorate, funded within R&RA. While the final bill does not mention IT² by name, it does provide an additional \$90 million in new money for CISE, designated "specifically for research in IT areas recommended in the PITAC report and HR 2086."

The President's Information Technology Advisory Committee (PITAC), which issued its final report in February 1999, recommended that the federal investment in information technologies R&D be increased by \$1.37 billion over the next five years and that a strategic initiative be created to support fundamental computing research that will lead to breakthroughs and new capabilities to serve the growing demands on information technologies. In response, the Administration created the IT² initiative, while in Congress the House Science Committee introduced a bill (HR 2086) to authorize a multi-year IT research initiative following the PITAC recommendations. The additional CISE funds will go for fundamental research on software, scalable information infrastructure, and high-end computing, all areas that IT² proposes to address. The CISE budget of \$392 million represents a 31 percent increase over FY 1999.

The remaining \$36 million of NSF's proposed contribution to IT² comes from the Major Research Equipment account to fund Terascale Computing Systems, a facilities project to build a five-teraflop (trillions of computing operations a second) computing site. Congress granted this request. The **Major Research Equipment** account receives \$95 million, up \$10 million from the request and \$5 million from FY 1999. The additional \$10 million above the request will go to begin production of a new high-altitude research aircraft.

The Biological Sciences (BIO) Directorate within R&RA receives \$416 million, \$26 million or 6.5 percent more than FY 1999. The bill boosts funding for the third year of the Plant Genome Research Program from a requested \$55 million to \$60 million. NSF's new **Integrative Activities** account, which supports emerging cross-disciplinary research and major research instrumentation, receives \$130 million, far less than the request and FY 1999 level of \$161 million. Although the final bill provides the requested \$50 million for the new **Biocomplexity** initiative and \$50 million (the same as FY 1999 and the FY 2000 request) for Major Research Instrumentation, the bill does not provide any funding for the Opportunity Fund, a fund designed to support innovative, cross-disciplinary research taking advantage of emerging scientific opportunities. In FY 1999, the Fund received \$24 million.

Education and Human Resources receives \$697 million, \$35 million more than FY 1999, including \$55 million for the **Experimental Program to Stimulate Competitive Research** (EPSCoR; up from \$48 million), a program to improve the research competitiveness of 18 states (and Puerto Rico) traditionally underrepresented as recipients of federal research funding. The final VA-HUD bill transfers the EPSCoR program and its funds to a new Office of Innovation Partnerships, and charges the new office with administering EPSCoR and also assisting non-EPSCoR institutions that receive relatively little federal research funding expand their research capacity and competitiveness. The new office receives \$10 million in addition to the \$55 million in EPSCoR funds.

NSF is the only federal agency with responsibility for research in all major science and engineering fields. As shown in Figure 1, NSF has a balanced research portfolio covering the breadth of science and engineering. In most fields, NSF is the largest or second-largest source of federal funding.

Although growth in the NSF budget stagnated somewhat in the mid-1990s, in the last few years NSF has received significant funding increases, and most disciplines have shared in this growth. Figure 2 shows recent trends in NSF support for selected disciplines.

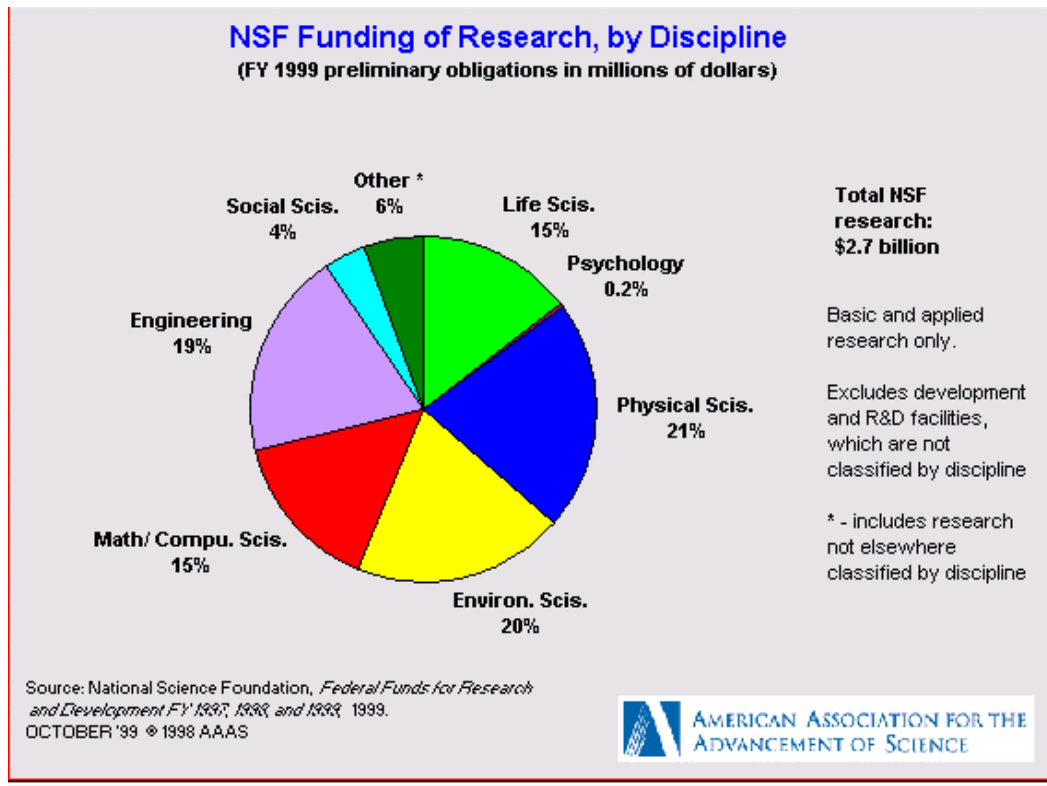


Figure 1.

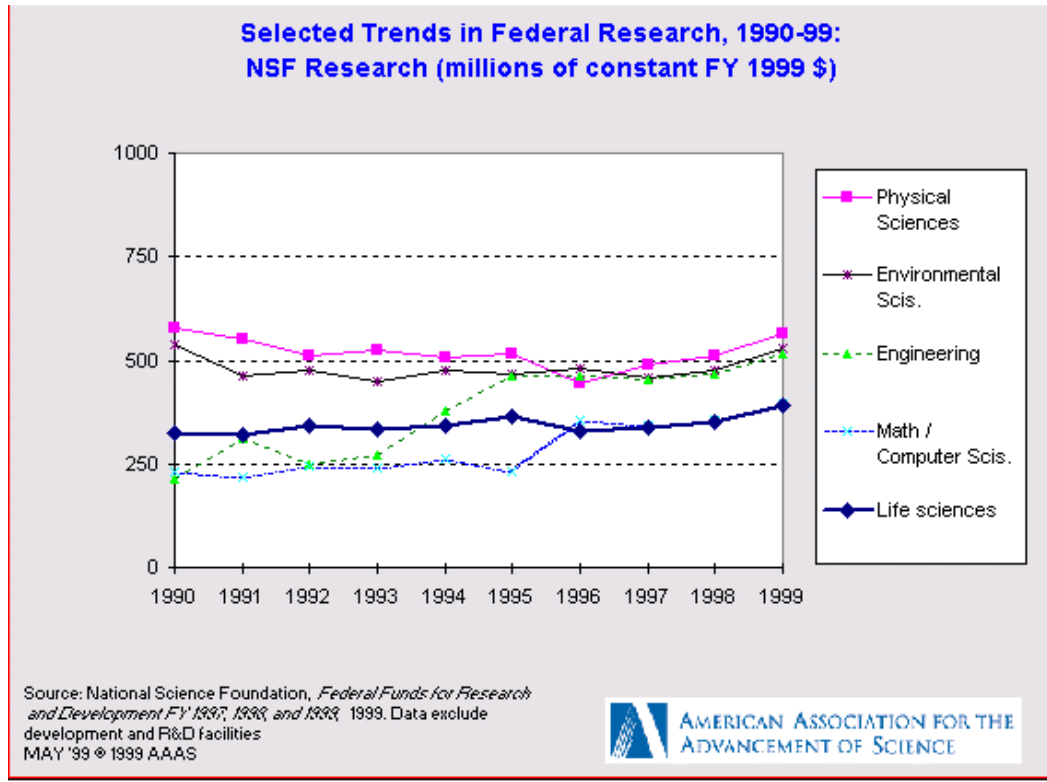


Figure 2.

Figure 2 shows that in the early to mid 1990s, support for these disciplines stagnated, but NSF support of research in all five of the above disciplines increased in real terms between FY 1996 and FY 1999, a trend that is likely to continue in FY 2000. For the past few years, NSF has increased support for these disciplines at similar rates. The large increase for CISE in FY 2000 is likely to skew the FY 2000 results and show a far higher increase for mathematics and computer sciences research compared to other disciplines.

[President Clinton signed the VA-HUD bill into law on October 20.] Although these funding levels would be final under normal circumstances, Congress may still re-open completed FY 2000 appropriations if it runs into trouble passing the remaining appropriations bills. Congress is seriously considering enacting across-the-board cuts in discretionary spending to get all FY 2000 appropriations under budget targets. These cuts could affect NSF and other agencies in the VA-HUD bill even after the bill becomes law.

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**Table. National Science Foundation
House-Senate Conference on R&D in the FY 2000 Budget
(budget authority in millions of dollars)**

	FY 1999 Estimate	FY 2000 Request	House-Senate Conference				
			FY 2000 CONF.	Chg. from Request		Chg. from FY 1999	
				Amount	Percent	Amount	Percent
Research and Related Activities ^{1 2} :							
Mathematical and Physical Sciences	734	754	759	5	0.7%	25	3.4%
Engineering	369	379	381	3	0.7%	13	3.4%
Biological Sciences	391	409	416	8	1.9%	26	6.5%
Geosciences	473	485	489	3	0.7%	16	3.3%
Computer and Info. Science and Eng.	299	423	392	-31	-7.3%	93	31.1%
- <i>Information Tech. Initiative (IT²)</i> *	0	110	(90)	-20	-18.2%	--	--
Social, Behavioral and Econ. Scis.	137	143	144	1	0.7%	7	4.9%
US Polar Programs	245	251	255	4	1.6%	10	3.9%
Integrative Activities ¹	161	161	130	-31	-19.2%	-31	-19.3%
Total Research and Related Activities ^{1 2}	2,809	3,004	2,966	-38	-1.3%	157	5.6%
Major Research Equipment	90	85	95	10	11.8%	5	5.6%
Education and Human Resources R&D	108	108	108	0	0.0%	0	0.0%
Less Non-R&D in R&RA ²	-293	-307	-304	3	-0.9%	-11	3.9%
Total NSF R&D	2,714	2,890	2,865	-25	-0.9%	150	5.5%
Non-R&D Programs and Activities:							
Non-R&D in R&RA ²	293	307	304	-3	-0.9%	11	3.9%
Other Education and Human Res.	554	570	589	19	3.3%	35	6.2%
Salaries and Expenses	144	149	149	0	0.0%	5	3.5%
Inspector General	5	5	5	0	0.0%	0	4.8%
Total NSF Non-R&D Activities	996	1,032	1,047	16	1.5%	51	5.1%
Total NSF Budget	3,710	3,921	3,912	-9	-0.2%	202	5.4%

AAAS estimates. Includes conduct of R&D and R&D facilities.

Figures are rounded to the nearest million. Changes calculated from unrounded figures.

¹ R&RA figures include funding derived from the Intellectual Infrastructure fund in FY 1999.

² R&RA funds are not appropriated by directorate. The FY 2000 Conference directorate figures are AAAS estimates based on language in the FY 2000 appropriations bill.

* - There is no specific appropriation for IT² in the FY 2000 conference report. The FY 2000 Conference figure represents additional funds for IT research in areas similar to those proposed in the initiative.

Based on House-Senate conference funding levels.

These figures are final unless additional appropriations or rescissions are enacted in an omnibus appropriations bill.