

## FEDERAL ACADEMIC SCIENCE AND ENGINEERING OBLIGATIONS ROSE BY 2.5% IN FY 2004

by Richard J. Bennof

The latest statistics from the National Science Foundation (NSF) Survey of Federal Science and Engineering Support to Universities, Colleges, and Non-profit Institutions show that federal agencies obligated a new high of \$27.3 billion to academic institutions for science and engineering (S&E) activities in FY 2004, an increase of 2.5% in current dollars (0.1% in constant dollars) over FY 2003 levels (table 1). This increase follows a 9% current-dollar increase (7% in constant dollars) in total federal academic S&E support between FY 2002 and FY 2003.

### Categories of Support

Federal academic S&E obligations are divided into six categories: research and development (R&D), which has accounted for 84%–87% of total federal academic S&E obligations over the last decade (figure 1); R&D

plant; facilities and equipment for S&E instruction; fellowships, traineeships, and training grants (FTTGs); general support for S&E; and other S&E activities.

Federal academic R&D obligations reached a new high of \$23.8 billion in FY 2004, a 4% current-dollar increase (2% in constant dollars) over the prior year (table 1). The Department of Health and Human Services (HHS) accounted for 63% (\$15.1 billion) of all federal academic R&D obligations in FY 2004 (table 2) and for virtually all of the total R&D increase between FY 2003 and FY 2004.

Federal support in FY 2004 for R&D plant fell by nearly one-half (47%), to a level of \$382 million (table 1). The National Institutes of Health (NIH) (within HHS) was directly responsible for virtually all of the decrease in academic R&D plant as it was for 90% of the academic R&D plant increase the prior year, which had included one-time increases exceeding \$100 million at both Boston University and the University of Texas Medical Branch at Galveston.

One of the four remaining S&E categories, FTTGs, was also at record funding levels in FY 2004.

- Federal obligations for FTTGs increased 10% to more than \$1 billion, with HHS's Health Resources and Services Administration providing most of the increase.
- Obligations for other S&E activities<sup>1</sup> decreased by 4%, to \$1.6 billion.

TABLE 1. Federal academic S&E obligations, by activity: FY 2003–04

Activity	Amount (\$ millions)		% change	
	FY 2003	FY 2004	Current dollars	Constant 2000 dollars
Academic S&E obligations	26,660	27,338	2.5	0.1
Research and development	22,804	23,811	4.4	2.0
R&D plant	726	382	-47.4	-48.6
Facilities and equipment for S&E instruction	86	83	-3.8	-6.1
Fellowships, traineeships, and training grants	950	1,048	10.3	7.8
General support for science and engineering	429	421	-1.7	-4.1
Other S&E activities	1,664	1,593	-4.3	-6.6

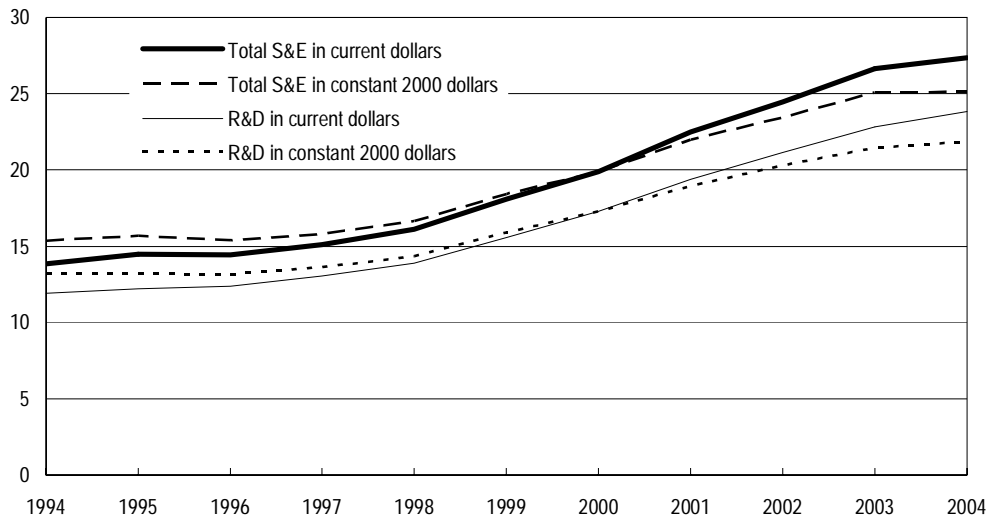
NOTES: Percent change is based on unrounded numbers. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2004.

<sup>1</sup> Academic S&E obligations that cannot be assigned elsewhere and activities in support of technical conferences, teacher institutes, and programs aimed at increasing precollege and undergraduate students' scientific knowledge.



FIGURE 1. Federal obligations for academic S&E activities and for S&E R&D: FY 1994–2004  
(Billions of dollars)



SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2004.

TABLE 2. Federal academic S&E obligations, by activity and agency: FY 2004  
(Millions of dollars)

Activity	All obligations	DOD	DOE	HHS	NASA	NSF	USDA	Other agencies <sup>1</sup>
Academic S&E obligations	27,337.9	2,470.4	803.6	16,498.5	1,176.0	4,188.0	1,153.6	1,047.9
Research and development	23,810.8	2,146.3	798.8	15,119.3	1,172.0	3,211.5	665.3	697.6
R&D plant	382.1	0.0	4.8	117.3	3.9	228.2	0.0	27.9
Facilities and equipment for S&E instruction	82.8	16.9	0.0	19.2	0.0	12.4	0.7	33.6
Fellowships, traineeships, and training grants	1,048.2	8.0	0.0	887.5	0.0	40.6	32.9	79.3
General support for science and engineering	421.3	0.8	0.0	325.9	0.0	7.8	0.4	86.4
Other S&E activities	1,592.7	298.4	0.0	29.3	0.0	687.5	454.3	123.1

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

<sup>1</sup>Includes data for the following agencies: the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, Interior, Labor, and Transportation; the Agency for International Development; the Environmental Protection Agency; the Appalachian Regional Commission; the Nuclear Regulatory Commission; the Office of Justice Programs (part of Department of Justice); and the Social Security Administration.

NOTES: Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2004.

- Funds for facilities and equipment for S&E instruction fell to \$83 million, a 4% decrease, with HHS reporting most of the decline.
- Funding for general support projects<sup>2</sup> totaled \$421 million, a 2% decrease stemming almost entirely from decreased Department of Commerce support.

<sup>2</sup> Funds used for scientific projects and support for activities within a specified discipline; explicit purpose is not specified.

### Agency Sources

The Department of Health and Human Services accounted for 60% of all federal FY 2004 academic S&E obligations (table 3). Three agencies, NSF (15% of academic S&E), the Department of Defense (DOD) (9% of academic S&E), and HHS, when combined, provided 85% of total federal academic S&E funding. The National Aeronautics and Space Administration (NASA), the Department of Agriculture (USDA), and

TABLE 3. Federal academic S&amp;E obligations, by agency: FY 2003–04

Agency	Amount (\$ millions)		% change	
	FY 2003	FY 2004	Current dollars	Constant 2000 dollars
All agencies	26,660	27,338	2.5	0.1
Department of Health and Human Services	15,876	16,499	3.9	1.5
National Science Foundation	3,954	4,188	5.9	3.4
Department of Defense	2,528	2,470	-2.3	-4.6
National Aeronautics and Space Administration <sup>1</sup>	1,263	1,176	-6.9	-9.1
Department of Agriculture	1,145	1,154	0.7	-1.6
Department of Energy	761	804	5.6	3.1
Other agencies <sup>2</sup>	1,132	1,048	-7.5	-9.6

<sup>1</sup>In FY 2004, NASA implemented a full-cost budget approach that includes all of the direct and indirect costs for procurement, personnel, travel and other infrastructure-related expenses relative to a particular program and project. Data for FY 2004 may not be directly comparable to data for FY 2003.

<sup>2</sup>Includes data for the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, the Interior, Labor, and Transportation; Agency for International Development; Environmental Protection Agency; Appalachian Regional Commission; Nuclear Regulatory Commission; Office of Justice Programs (part of Department of Justice); and Social Security Administration.

NOTES: Percent change is based on unrounded numbers. Details may not add to totals because of rounding.

The agency data for the Department of Homeland Security were first reported for FY 2004. Agencies are listed in rank order of their FY 2004 academic S&E totals.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2004.

the Department of Energy (DOE) provided most of the remaining academic S&E total, over 11% of academic S&E federal funding. Of these six agencies, three, NASA,<sup>3</sup> DOD, and USDA decreased their FY 2004 academic S&E levels in constant dollars.

### University Shares

The Johns Hopkins University (including its Applied Physics Laboratory) continued to be the leading academic recipient of federal academic S&E obligations in FY 2004 (table 4). Together, HHS and DOD provided Johns Hopkins with almost five-sixths of its federal S&E funds. Over \$4 of every \$5 in the university's total federal S&E obligations (\$1.27 billion) supported R&D programs, with most of the remainder allocated to other S&E activities.

The top 20 universities in terms of federal academic S&E obligations accounted for 35% of the federal academic S&E total in FY 2004. Eighteen of these 20

academic recipients were also ranked among the top 20 recipients in the previous year. Cornell University (ranked 17<sup>th</sup> in FY 2004, jumping from 21<sup>st</sup> in FY 2003) and the Massachusetts Institute of Technology (ranked 20<sup>th</sup> in FY 2004, up from 23<sup>rd</sup> in FY 2003) replaced Boston University (ranked 37<sup>th</sup> in FY 2004, dropping from 17<sup>th</sup> the previous year) and the University of North Carolina at Chapel Hill (ranked 21<sup>st</sup> in FY 2004, after being 20<sup>th</sup> the prior year).

There were more academic institutions receiving federal S&E support in FY 2004 (1,243 academic institutions) than there had been in any of the previous 31 years. Over the last decade, a decrease in the number of universities and colleges that received R&D obligations (down to 872 institutions in FY 2004, from 934 institutions in FY 1994) has been offset by strong growth in the numbers that had R&D plant and FTTGs support. Support in these two "capacity-building" categories, when combined, went from 771 institutions in FY 1994 to 962 institutions in FY 2004.

### Federal S&E Support to Nonprofit Institutions

NSF collects statistics on federal obligations to independent nonprofit institutions for two of the six S&E

<sup>3</sup> In FY 2004, NASA implemented a full-cost budget approach that includes all of the direct and indirect costs for procurement, personnel, travel and other infrastructure-related expenses relative to a particular program and project. Data for FY 2004 may not be directly comparable to data for FY 2003.

TABLE 4. Federal academic S&E support to the 20 top-ranked universities in order of total S&E obligations, by agency: FY 2004  
(Millions of dollars)

Institution	All obligations	DOD	DOE	HHS	NASA	NSF	USDA	Other agencies <sup>2</sup>
All institutions	27,337.9	2,470.4	803.6	16,498.5	1,176.0	4,188.0	1,153.6	1,047.9
Johns Hopkins U. <sup>1</sup>	1,271.8	430.7	3.7	619.0	162.0	30.2	0.6	25.5
U. WA	654.0	38.1	15.0	467.3	8.6	87.2	3.9	34.0
U. PA	534.0	17.0	7.6	463.9	1.5	33.0	0.7	10.4
U. MI	519.6	53.2	10.7	366.0	13.3	65.0	1.6	9.8
Stanford U.	507.9	36.1	14.3	298.1	96.5	60.8	0.0	2.0
U. CA-Los Angeles	498.9	34.4	22.0	365.3	13.2	59.9	0.8	3.4
U. WI-Madison	470.1	19.1	24.4	256.7	11.5	119.8	33.9	4.9
U. CA-San Diego	464.0	22.8	11.1	305.1	4.5	120.0	0.0	0.1
Harvard U.	424.7	15.0	9.7	350.9	8.0	34.1	0.0	7.1
U. CA-San Francisco	423.6	3.7	0.0	417.0	1.3	1.5	0.0	0.0
Duke U.	415.1	23.8	8.0	349.8	2.6	27.4	0.4	3.2
WA. U.	407.3	5.2	3.0	382.2	4.6	11.9	0.3	0.2
Columbia U.	406.1	7.8	13.1	301.8	0.0	69.4	0.0	14.1
U. Pittsburgh	394.6	9.0	3.1	359.4	2.0	18.6	0.0	2.5
U. Colorado	386.3	13.9	6.5	236.8	49.7	62.8	0.1	16.4
Yale U.	371.5	6.4	10.1	327.7	1.2	22.3	0.7	2.9
Cornell U.	371.1	13.1	7.7	183.6	5.5	116.8	40.0	4.3
U. Minnesota	365.6	14.9	6.3	234.4	5.6	59.4	29.3	15.6
PA State U.-University Park	358.6	166.4	11.9	88.9	13.2	47.8	23.8	6.4
MA Inst of Technology	354.1	45.6	62.6	165.8	16.7	57.9	0.1	5.4
Top 20 institutions	9,598.8	976.2	250.9	6,539.7	421.5	1,105.7	136.2	168.2

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

<sup>1</sup>Includes funding for Applied Physics Laboratory.

<sup>2</sup>Includes data for the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, the Interior, Labor, and Transportation; Agency for International Development; Environmental Protection Agency; Appalachian Regional Commission; Nuclear Regulatory Commission; Office of Justice Programs (part of Department of Justice); and Social Security Administration.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2004.

categories—R&D and R&D plant. Such federal obligations increased by over 6%, to a new high of \$6.1 billion, between FY 2003 and FY 2004 (table 5). Most of the increased funding was from DOD and HHS, primarily from NIH. Massachusetts General Hospital received the most federal R&D and R&D plant funds among nonprofits in FY 2004, with HHS providing most of its federal support. The 10 top-ranked nonprofit institutions in terms of these federal funds in FY 2004 received 31% of the total funding to all nonprofits. Six of these 10 nonprofit recipients were hospitals or medical research institutes. Nine of these leading 10 nonprofits in FY 2004 also ranked among the top 10 in the prior year. In FY 2004, the IIT Research Institute replaced the Whitehead Institute for Biomedical Research within the top 10 nonprofits. Of all nonprofit recipients that

were not hospitals or medical research institutes, the Mitre Corporation received the largest amount (\$284 million) of federal R&D and R&D plant obligations.

### Data Notes

The data on federal academic S&E obligations to academic and nonprofit institutions presented in this *InfoBrief* were obtained from 19 agencies that participated in the FY 2004 Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions. The survey collects federal S&E support data by funding agency, institution, type of activity, type of institution, and geographic location.

Profiles for individual doctorate-granting institutions and for schools with S&E departments that grant master's

TABLE 5. Federal research and development and R&amp;D plant obligations to the 10 top-ranked independent nonprofit institutions in order of total S&amp;E obligations, by agency: FY 2004

(Dollars in thousands)

Institution	All obligations	DOD	DOE	HHS	NASA	NSF	USDA	Other <sup>1</sup>
All nonprofit institutions	6,081,849	1,118,265	87,780	4,087,273	181,103	296,494	21,310	289,624
MA General Hospital	296,765	15,251	117	278,611	0	2,786	0	0
Mitre Corp.	284,478	284,100	0	0	0	229	0	149
Brigham and Women's Hospital	233,907	6,228	0	227,161	0	460	0	58
Fred Hutchinson Cancer Research Ctr.	213,461	814	0	211,523	0	1,124	0	0
Mayo Foundation	208,152	10,586	0	197,493	73	0	0	0
Henry M. Jackson Foundation	140,996	109,396	598	30,056	354	592	0	0
Battelle Memorial Institute	137,764	50,651	1,255	62,420	6,500	0	0	16,938
IIT Research Institute	126,516	121,260	0	5,256	0	0	0	0
Dana-Farber Cancer Institute	125,490	4,714	0	120,776	0	0	0	0
Beth Israel Deaconess Medical Ctr.	114,331	3,520	232	110,476	0	103	0	0
Top 10 institutions	1,881,860	606,520	2,202	1,243,772	6,927	5,294	0	17,145

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

<sup>1</sup> Includes data for the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, the Interior, Labor, and Transportation; Agency for International Development; Environmental Protection Agency; Nuclear Regulatory Commission; Office of Justice Programs (part of Department of Justice); and Social Security Administration.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2004.

degrees are available at [www.nsf.gov/statistics/profiles](http://www.nsf.gov/statistics/profiles). These profiles contain data from this survey and from the Survey of Research and Development Expenditures at Universities and Colleges and the Survey of Graduate Students and Postdoctorates in Science and Engineering. Data from the three surveys are also available via NSF's WebCASPAR database system, a Web tool for retrieval and analysis of statistical data on academic S&E resources (<http://webcaspar.nsf.gov>).

The full set of detailed statistical tables on the FY 2004 Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit

Institutions will be available online at <http://www.nsf.gov/statistics/fedsupport/>. Individual detailed tables from the 2004 survey may be available in advance of publication of the full report. For further information, contact

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