# NSF Fiscal Year 1999 Budget Request

*This article is the 26th in an annual series of reports outlining the president's request to Congress for the NSF budget. Last year's report appeared in the June/July 1997 issue of the* Notices, *pages 690–693.*

On February 2, 1998, President Clinton presented his budget for fiscal year 1999 to Congress, marking the first time in thirty years that a president produced a balanced budget. There is much the scientific community can cheer about, for the budget contains a 2.6% increase for research and development overall and a 7.8% increase for basic civilian research. These increases are rather surprising, after the dire prognostications over the last several years of ever-leaner budgets for scientific research. But they also are the result of hard work by a coalition of leaders of about one hundred scientific societies, including the AMS, who have for the past year been making the case for support of science. Their efforts have paid off, not only in the strong showing of science in the Clinton budget, but also in the bipartisan support science enjoys in Congress.

Still, the road from request to appropriation can be a long and rocky one. As an example of the kinds of delays that can occur, consider that at the time President Clinton presented this budget request, the National Science Foundation (NSF) had still not received from Congress final approval for the current fiscal year (fiscal year 1998), which had started four months earlier. In addition, some Republicans claim that the Clinton budget's projections are overly optimistic.

There are other obstacles as well. In August 1997 President Clinton signed into law spending caps on discretionary funding. With the caps, nondefense R&D spending would be $4 billion less than the amount proposed in the budget request. To get around the caps, the president has proposed the formation of the "Research Fund for America" (also called the "21st Century Research Fund"), which encompasses the NSF and most programs supporting nondefense R&D. The fund would provide the additional $4 billion needed to bring spending on these programs up to the requested level. One difficulty is that $3.6 billion of that amount is to come from the settlement with tobacco companies. Congress has not approved a tobacco settlement, and any such legislation will likely prove highly contentious. In addition, it is unclear that Congress will agree to this attempt to exceed the spending caps set last year.

Assuming that the Clinton request becomes reality, the budget of the NSF would grow from $3.5 billion to $3.8 billion, an increase of around 9%. Within the NSF, mathematics has done quite well. One of the biggest initiatives at the NSF is Knowledge and Distributed Intelligence, which has a strong mathematics component and a requested budget of $78 million (see `www.nsf.gov/kdi/` for further information). The Mathematical and Physical Sciences (MPS) Directorate would receive an increase of $76.3 million or 10.7%, which is the largest dollar increase and the smallest percentage increase of all the NSF research directorates. The big winner among the divisions in the MPS is the Division of Mathematical Sciences (DMS), which is slated for a hefty 17.4% increase. The MPS budget document singles out "fundamental and applied mathematics" as one of its priority areas. This is the first time in the history of DMS that an increase was proposed that put it over the $100 million mark. Table 3 tracks the growth of the DMS budget over fifteen years, showing healthy constant-dollar increases after the 1984 appearance of the David Report and spotty growth since the late 1980s. Since 1994 the DMS has done fairly well, considering the weak pattern of growth for the NSF budget overall. In this period any growth in the DMS budget has stemmed from the Division's active participation in NSF initiatives.

Donald J. Lewis, director of the DMS, is happy but cautious about the requested increase for his division. Even if the increase emerges unscathed from the appropriations process, he points out that a certain amount will be taken out in the form of "taxes" that go to support NSF programs that

stretch across several disciplines, such as the Office of Multidisciplinary Activities (OMA) or a program for research instrumentation. The money is not entirely lost to mathematics though, because the programs receiving the taxes are ones to which mathematicians may submit proposals. For example, Lewis notes that in recent years mathematicians have received $5–$7 million per year in grants from the OMA. How large the taxes might be for fiscal 1999 is not clear yet. As an example, Lewis notes that although the fiscal year 1997 budget for the DMS is officially $92.9 million, the DMS really had only about $90 million to spend after the taxes were taken out. Nevertheless, Lewis is optimistic about the 1999 budget request, which he says shows that "mathematics was getting a good reading" within the NSF. The director of MPS, Robert Eisenstein, is impressed with the work the DMS has supported and was the main force behind the division's large increase.

This increase is broken out into two components: Research Project Support, which would rise 12.7% (from $70.2 million to $79.1 million), and Infrastructure Support, which would rise 29.6% (from $27 million to $35 million). Research Project Support provides funding for principal investigator grants. Of the additional $8.9 million requested for this part of the DMS budget, about $6 million would be used to increase the size and duration of grants given to the most promising investigators. The increase in size can come in any grant component, including investigator salary. Right now a substantial proportion of DMS-supported investigators receive only one-month summer salary support. Many will bemoan the fact that the new funds would not be used to increase the number of grants DMS gives. The reason can be traced to the National Science Board, the policy-making body of the NSF, which has concluded that the NSF needs to increase the size and duration of its grants. In addition, the Office of Management and Budget specifically directed the NSF to increase grant size and duration in fiscal year 1999. Because grants in mathematics are already smaller than those in other areas, the pressure on the DMS to increase grant size is considerable. The remaining $2.9 million in the increase for Research Project Support would go toward grants in mathematics that con-

**Table 1:** National Science Foundation (Millions of Dollars)

| | 1995 Actual | Change | 1996 Actual | Change | 1997 Actual | Change | 1998 Plan | Change | 1999 Request |
|---|---|---|---|---|---|---|---|---|---|
| (1) Mathematical Sciences Research Support | $ 85.3 | 2.8% | $ 87.7 | 5.9% | $ 92.9 | 4.6% | $ 97.2 | 17.4% | $ 114.1 |
| (2) Other Research Support (Note a) | 2439.6 | -2.4% | 2381.0 | 2.8% | 2447.2 | 5.7% | 2586.0 | 9.3% | 2826.7 |
| (3) Education and Human Resources (Note b) | 611.9 | -1.7% | 601.2 | 3.0% | 619.1 | 2.2% | 632.8 | 7.9% | 683.0 |
| (4) Salaries and Expenses (Note c) | 133.5 | 2.2% | 136.5 | 2.3% | 139.6 | 1.6% | 141.8 | 5.2% | 149.2 |
| (5) Totals | 3270.3 | -2.0% | 3206.3 | 2.9% | 3298.8 | 4.8% | 3457.8 | 9.1% | 3773.0 |
| (6) (1) as a % of the sum of (1) and (2) | 3.38% | | 3.55% | | 3.66% | | 3.62% | | 3.88% |
| (7) (1) as a % of (5) | 2.61% | | 2.73% | | 2.82% | | 2.81% | | 3.02% |

**Note a:** Support for research and related activities in areas other than the mathematical sciences. Includes scientific research facilities and instrumentation, and the Antarctic program. **Note b:** The programs in this category provide support in all fields, including the mathematical sciences. **Note c:** Administrative expenses of operating the Foundation, including the Office of Inspector General.

**Table 2:** Directorate for Mathematical and Physical Sciences (Millions of Dollars)

| | 1995 Actual | % of Total | 1996 Actual | % of Total | 1997 Actual | % of Total | 1998 Plan | % of Total | 1999 Request | % of Total |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) Mathematical Sciences | $ 85.3 | (13.2%) | $ 87.7 | (13.3%) | $ 92.9 | (13.4%) | $ 97.2 | (13.6%) | $ 114.1 | (14.4%) |
| (2) Astronomical Sciences | 102.5 | (16.0%) | 108.7 | (16.5%) | 113.5 | (16.4%) | 117.8 | (16.5%) | 128.0 | (16.2%) |
| (3) Physics | 130.0 | (20.1%) | 131.9 | (20.0%) | 138.6 | (20.0%) | 148.5 | (20.7%) | 171.9 | (21.7%) |
| (4) Chemistry | 123.1 | (19.1%) | 127.7 | (19.3%) | 133.7 | (19.3%) | 135.6 | (18.9%) | 148.0 | (18.7%) |
| (5) Materials Research | 174.8 | (27.1%) | 175.1 | (26.5%) | 185.0 | (26.7%) | 186.6 | (26.1%) | 200.0 | (25.2%) |
| (6) Office of Multidisciplinary Activities | 29.5 | (4.6%) | 29.5 | (4.5%) | 29.8 | (4.3%) | 30.0 | (4.2%) | 30.0 | (3.8%) |
| (7) Totals | 645.2 | (100.0%) | 660.5 | (100.0%) | 693.5 | (100.0%) | 715.7 | (100.0%) | 792.0 | (100.0%) |

tribute to some of the areas of emphasis for the MPS in 1999, including research on the origins of the universe, on the "quantum realm," and on phenomena at the molecular level.

Infrastructure Support provides funding for a number of DMS activities, including institutes, conferences, and postdoctoral fellowships. The recompetition for the mathematics institutes is taking place this year; the deadline for proposals was in early February 1998. The DMS cannot release the exact number of proposals in the competition, but they say it is between ten and twenty. Lewis says the DMS will fund up to five grants, though some of these may be quite different from the current institutes in Berkeley and Minneapolis. About $0.5 million in the increase for Infrastructure Support would be set aside to allow flexibility in institute funding; $4.5 million of the increase would go into the VIGRE program (Vertically Integrated Grants for Research and Education in the Mathematical Sciences). VIGRE provides grants for mathematics departments for integrating efforts to improve research and education opportunities for undergraduate and graduate students and for postdocs. The remainder of the increase, $3 million, is slated for a program which would be run in collaboration with the Department of Education and would focus on improving the training and background of K–8 mathematics teachers. The DMS did not volunteer to become involved in this program; higher-ups at the NSF saw DMS involvement as a way of bringing in mathematics departments rather than focusing only on schools of education to improve the training of mathematics teachers.

*—Allyn Jackson*

*Note on the tables: Last year the tables traditionally presented in the* Notices *were amended to eliminate the Science and Technology Centers as a separate line item, since the funding for this budget component has reverted from a central office at the NSF to the disciplinary divisions. Because this change makes comparisons with past tables more difficult, this year Table 3 provides information going back fifteen years, prior to the establishment of the Science and Technology Centers program.*

## **Table 3:** 15-Year Compilation of the NSF Budget, 1984–1999 (Millions of Dollars)

| | 1984 Actual | 1985 Actual | 1986 Actual | 1987 Actual | 1988 Actual | 1989 Actual | 1990 Actual | 1991 Actual | 1992 Actual |
|---|---|---|---|---|---|---|---|---|---|
| **(1) Mathematical Sciences Research Support** | $ 41.2 | $ 47.7 | $ 51.9 | $ 59.9 | $ 63.8 | $ 66.0 | 69.3 | 73.1 | 78.4 |
| *Constant Dollars* | *39.7* | *44.3* | *47.4* | *52.7* | *53.9* | *53.2* | *53.0* | *53.7* | *55.9* |
| **(2) Other Research Support** | 1137.2 | 1302.6 | 1283.8 | 1390.3 | 1434.7 | 1557.5 | 1637.5 | 1913.9 | 1913.4 |
| *Constant Dollars* | *1094.5* | *1210.6* | *1171.4* | *1223.9* | *1212.8* | *1256.0* | *1252.9* | *1405.2* | *1363.8* |
| ***(3) Education and Human Resources*** | 60.3 | 84.7 | 85.7 | 99.6 | 139.6 | 171.1 | 220.6 | 322.0 | 441.4 |
| *Constant Dollars* | *58.0* | *78.7* | *78.2* | *87.7* | *118.0* | *138.0* | *168.8* | *236.4* | *314.6* |
| **(4) Salaries and Expenses** | 66.3 | 72.0 | 71.8 | 77.8 | 84.5 | 91.3 | 98.7 | 104.1 | 113.9 |
| *Constant Dollars* | *63.8* | *66.9* | *65.5* | *68.5* | *71.4* | *73.6* | *75.5* | *76.4* | *81.2* |
| **(5) Totals** | 1305.0 | 1507.0 | 1493.2 | 1627.6 | 1722.6 | 1885.9 | 2026.1 | 2413.1 | 2547.1 |
| *Constant Dollars* | *1256.0* | *1400.6* | *1362.4* | *1432.8* | *1456.1* | *1520.9* | *1550.2* | *1771.7* | *1815.5* |

*Table 3 continued*

| | 1993 Actual | 1994 Actual | 1995 Actual | 1996 Actual | 1997 Actual | 1998 Plan | 1999 Request | 1984–1997 Increase | 1984–1999 Increase |
|---|---|---|---|---|---|---|---|---|---|
| **(1) Mathematical Sciences Research Support** | $ 77.6 | $ 78.0 | $ 85.3 | $ 87.7 | $ 92.9 | 97.2 | 114.1 | 125.5% | 176.9% |
| *Constant Dollars* | *53.7* | *52.6* | *56.0* | *55.9* | *57.9* | | | *45.8%* | |
| **(2) Other Research Support** | 2052.5 | 2212.8 | 2439.6 | 2381.0 | 2447.2 | 2586.0 | 2826.7 | 115.2% | 148.6% |
| *Constant Dollars* | *1420.4* | *1493.1* | *1600.8* | *1517.5* | *1524.7* | | | *39.3%* | |
| **(3) Education and Human Resources** | 505.1 | 569.0 | 611.9 | 601.2 | 619.1 | 632.8 | 683.0 | 926.7% | 1032.7% |
| *Constant Dollars* | *349.6* | *383.9* | *401.5* | *383.2* | *385.7* | | | *565.0%* | |
| **(4) Salaries and Expenses** | 114.5 | 127.4 | 133.5 | 136.5 | 139.6 | 141.8 | 149.2 | 110.6% | 125.0% |
| *Constant Dollars* | *79.2* | *86.0* | *87.6* | *87.0* | *87.0* | | | *36.4%* | |
| **(5) Totals** | 2749.7 | 2987.2 | 3270.3 | 3206.3 | 3298.8 | 3457.8 | 3773.0 | 152.8% | 189.1% |
| *Constant Dollars* | *1902.9* | *2015.7* | *2145.9* | *2043.5* | *2055.3* | | | *63.6%* | |

Current dollars are converted to constant dollars using the Consumer Price Index (based on prices during 1982–84).