

DIVISION OF MATHEMATICAL SCIENCES (DMS) **\$245,000,000**
+\$7,230,000 / 3.0%

DMS Funding
(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over	
				FY 2012 Estimate Amount	Percent
Total, DMS	\$239.79	\$237.77	\$245.00	\$7.23	3.0%
Research	214.10	219.11	224.17	5.06	2.3%
<i>CAREER</i>	8.16	3.33	4.00	0.67	20.1%
<i>Centers Funding (total)</i>	-	0.10	0.10	-	-
<i>Centers for Analysis & Synthesis</i>	-	0.10	0.10	-	-
Education	25.69	18.66	20.83	2.17	11.6%
Infrastructure	-	-	-	-	N/A

Totals may not add due to rounding.

The National Science Foundation plays a critical role in the mathematical and statistical sciences, as it provides more than sixty percent of all federal support for basic research in the Nation's colleges and universities. In certain core areas of the mathematical sciences this percentage is much higher, since the NSF supports a broader range of fundamental and multidisciplinary research topics than do other federal agencies. DMS supports research at the frontiers of fundamental, applied, and computational mathematics and statistics and also enables discovery and innovation in other fields of science and engineering. In turn, advances in science and engineering, especially those generating big and complex data sets or that are driven by powerful computing environments, require development of ever more sophisticated mathematical and statistical tools. DMS plays a key role in training future researchers in the mathematical and statistical sciences, and in training the Nation's scientific and engineering workforce.

DMS supports core research programs in algebra and number theory; analysis; applied mathematics; computational mathematics; geometry and topology; mathematical biology; probability, combinatorics and foundations; and various areas within statistics. In addition, DMS supports national mathematical and statistical sciences research institutes; training and mentoring of a diverse group of postdoctoral, graduate and undergraduate students; and infrastructure, such as workshops, conferences, and equipment.

Approximately 60 percent of the DMS portfolio is available for new research grants. The remaining 40 percent is used primarily to fund continuing grants made in previous years.

FY 2013 Summary

All funding decreases/increases represent change over the FY 2012 Estimate.

Research

- Support for CIF21 increases by \$3.11 million to a total of \$6.41 million. DMS research will focus on mathematical, statistical, and computational sciences, supporting theoretical and methodological developments in mathematics and statistics, the development of new models and algorithms, and visualization methods and computational tools that help solve complex scientific problems involving big and complex data and that enable scientific discovery and innovation. This investment expands upon some existing programs supporting research in the analysis of large data sets, development of

novel algorithms, and new computational methods in mathematics and statistics. It will also support training and networking activities, and help develop new theoretical foundations in mathematics and statistics related to CIF21 goals.

- SEES increases by +\$1.0 million to a total of \$3.50 million. This activity addresses challenges in climate, sustainability, and energy research and education through data analysis, modeling, and simulation. The investment in SEES will also support effective training and networking opportunities for collaborations among mathematical and statistical scientists and with domain scientists.
- Support for DMREF under the NSF-wide CEMMSS investment area is initiated at a total of \$4.50 million. DMS seeks to invest in innovative partnerships between academic mathematical and statistical scientists and other physical scientists, and to support research in Materials by Design as it relates to computational, mathematical, and statistical sciences in CIF21.
- BioMaPS support increases by \$980,000 to a total of \$2.90 million. DMS will invest in innovative research at the intersection of the mathematical and physical sciences and the biological sciences in a comprehensive new approach to acquire insight into and inspiration from the living world.
- SaTC is initiated at \$2.0 million. Addressing the challenges of cybersecurity requires multidisciplinary expertise in human, statistical, mathematical, computational, and computer sciences. DMS will invest in fundamental research in cryptographic methods, new algorithms, risk assessments, and methods for cybersecurity.
- Support for mathematical and statistical sciences institutes remains at \$29.50 million. Eight domestic DMS-supported institutes will continue to catalyze frontier research through an array of varied scientific programs.
- Consistent with this longstanding priority, funding for CAREER will increase (+\$670,000 to a total of \$4.0 million).

Education

- Support for E² is initiated at \$2.0 million. DMS will invest in the training through research involvement of the next generation of mathematicians and statisticians who are highly conversant in computational and data-enabled science and engineering.
- DMS invests in a number of additional education and diversity activities, including the Mathematical Sciences Postdoctoral Research Fellowships (MSPRF), Research Training Groups (RTG), Mentoring through Critical Transition Points (MCTP), and Research Experiences for Undergraduates (REU) programs. Investment in this portfolio increases by +\$2.17 million to a total \$20.83 million in FY 2013.