

## Mission

The Division of Mathematical Sciences supports research and education projects at the frontiers of discovery that achieve NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense." Modes of support include awards to individual investigators and small groups, workforce training grants, and a portfolio of national mathematical sciences research institutes. The Division supports research in core areas of mathematics and statistics as well as interdisciplinary research that cross traditional boundaries of the physical, biological, social and engineering sciences.

## Discovery, Connections, Community

The influence of mathematical science on our daily lives is fundamental and pervasive. For example, every secure commercial transaction on the Internet is an application of research in number theory and algebraic geometry. And improvements in weather prediction, search engines, and industrial design processes are predicated on advances in algorithms and computational mathematics. DMS invests in discovery in mathematics and statistics; promotes interdisciplinary connections across fields of science, engineering and technology; and cultivates a diverse and capable community of researchers, students, professionals. The Division's top investment priorities - discovery, connections and community - are essential components of innovation engine that drives the Nation's economy in the 21st century.

## New Initiatives

DMS is building on interdisciplinary activities and workforce programs developed or enhanced during the Mathematical Sciences Priority Area (FY 2003 – FY 2007). Successful programs such as Collaboration in Mathematical Geosciences and the Joint DMS/National Institute of General Medical Sciences Activity in Mathematical Biology are continuing and newer programs such as the CHE-DMR-DMS Solar Energy Initiative and Algorithms for Threat Detection are attracting broad interest from the mathematical sciences community.

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**Mathematical snowflakes:** In nature roughly a quintillion molecules make up every snow crystal that falls to earth, with the shape dictated by temperature, humidity and other local conditions. Researchers recently simulated the 3D growth of snowflakes using a computational model that faithfully emulates both the basic shapes and the fine details and markings of the full range of observed forms. Read about the underlying mathematics at <http://psoup.math.wisc.edu/Snowflakes.htm>.

Credit: David Griffeath and Janko Gravner

## Programs in Mathematical Sciences

### Core Programs

Algebra and Number Theory  
Analysis  
Applied Mathematics  
Combinatorics  
Computational Mathematics  
Foundations

Geometric Analysis  
Mathematical Biology  
Probability  
Statistics  
Topology

### Special DMS Programs

Algorithms for Threat Detection (ATM)  
CHE-DMR-DMS Solar Energy Initiative (SOLAR)  
Collaboration in Mathematical Geosciences (CMG)  
Focused Research Groups in the Mathematical Sciences  
Infrastructure  
Joint DMS/NIGMS Initiative in Mathematical Biology  
Mathematical Sciences: Innovations at the Interface with Computer Sciences

*A Guide to Programs / Browse Funding Opportunities* is available at [http://www.nsf.gov/funding/browse\\_all\\_funding.jsp](http://www.nsf.gov/funding/browse_all_funding.jsp).

The **Mathematical Sciences Research Institutes** program is a portfolio of projects that advances research in the mathematical sciences, increases the impact of the mathematical sciences in other disciplines, enables the mathematical sciences to respond to national needs, and expands the talent base engaged in mathematical and statistical research in the United States.

The **Workforce** program offers competitions such as Enhancing the Mathematical Sciences Workforce for the 21st Century (EMSW21), whose goal is to increase the number of well-prepared U.S. citizens, nationals, and permanent residents who pursue careers in the mathematical sciences and in other NSF-supported disciplines.

## Nebraska Conference for Undergraduate Women in Mathematics (NCUWM)

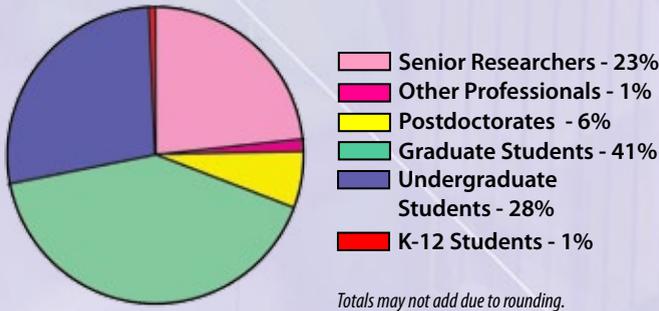


The Conference is open to outstanding undergraduate women mathematicians at all stages of their careers. Students will have the opportunity to meet other women who share their interest in the mathematical sciences and learn about life in graduate school from the perspective of current women graduate students representing math departments from across the country. See: <http://www.math.unl.edu/~ncuwm/12thAnnual/>

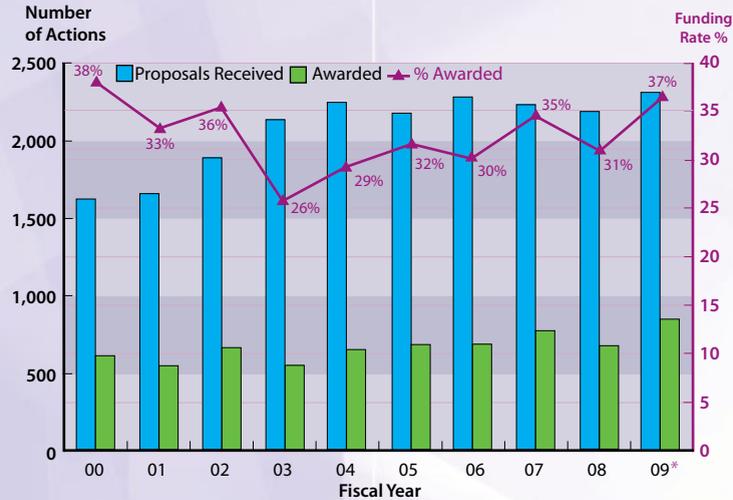
Credit: Judy Walker

**Human Resources FY 2009**

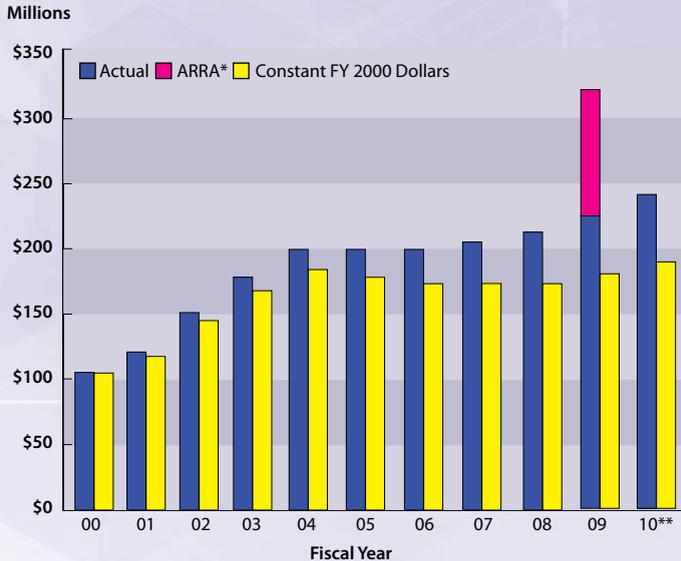
Pie chart showing total number of people involved in DMS.



**Funding Rates and Number of Actions**



**Budget in Actual and Constant FY 2000 Dollars**



Graph shows number of proposals submitted versus awarded for Research Grants as defined by NSF and resultant success rates. Success rate is defined as the number of new or renewal proposals awarded funding divided by the total number of proposals received.

\* FY 2009 funding rate includes awards made with ARRA funds.

Note: the distribution of success rates reflects the average for the Mathematical Sciences Division and may not represent success rates in individual programs.

DMS annual budgets in actual and constant FY 2000 dollars. Constant dollars show the purchasing power of the DMS budget. Over this 11-year period, the constant dollar budget for DMS has increased 82%.

\*ARRA - American Recovery and Reinvestment Act of FY 2009. \*\*Current Plan.

Data provided from FY 2000 to 2011 NSF Budget Requests to Congress, <http://www.nsf.gov/about/budget/>.

**Modes of Support FY 2009**

