

# Grant Proposals

Focus is on federal (US) grant proposals

Some funding agencies abroad:

- DAAD, DFG, Humboldt Foundation (Germany)
- EPSRC (UK)
- EU Marie Curie Actions Fellowships (incoming and outgoing)
- JSPS (Japan)

## Grant proposals ...

- Which funding agency?
- AMS/Simons Foundation grants
- AWM travel grants
- NSA grants
- NSF grants
  - What should be contained in an NSF proposal?
  - How are NSF proposals reviewed?
  - [How to write a proposal narrative?](#)
  - What can be supported by grants?

## Funding agencies ...

- **AMS / Simons Foundation:** Travel and Collaboration grants
- **AWM:** Travel grants
- **National Science Foundation (NSF)** provides 65% of the funding for academic research in the mathematical sciences, most of it through the Division of Mathematical Sciences (DMS)

Other funding agencies that provide funding for pure or applied mathematics are

		FY 2010 Actual	FY 2012 Budget
• Department of Defense			
• Air Force Office of Scientific Research (AFOSR)	National Science Foundation		
• Army Research Office (ARO)	Mathematical Sciences	245	<b>260</b>
• Office of Naval Research (ONR)	Department of Defense	102	<b>132</b>
• Defense Advanced Research Projects Agency (DARPA)	Air Force Off. of Sci. Res.	52	<b>61</b>
• National Security Agency (NSA)	Army Research Office	12	<b>12</b>
	Def. Adv. Res. Proj. Agency	12	<b>28</b>
	Natl. Security Admin	7	<b>6</b>
	Office of Naval Research	20	<b>26</b>
• Department of Energy	Department of Energy	93	<b>109</b>
	Applied Mathematics	44	<b>49</b>
• National Institutes of Health (NIH)	SciDAC <sup>1</sup>	50	<b>60</b>
	National Institutes of Health	89	<b>92</b>
	General Medical Sciences	50	<b>52</b>
	Imaging & Bioengineering	39	<b>40</b>
	<b>Total Mathematical Sciences</b>	<b>529</b>	<b>593</b>

## AMS-Simons Foundation and Simons Foundation grants

- **AMS-Simons Travel Grants: two years duration**
  - Provides \$2K per year to early-career mathematicians for research-related travel
  - Eligibility:
    - PhD completed within the last four years
    - Employed by US institution or be US citizen working abroad
    - Not currently in residence at an NSF Mathematics Institute, and not receiving external funds with substantial support for research or travel
  - Application deadline in late March
- **Collaboration Grants for Mathematicians: five year duration**
  - \$5K per year for collaboration, travel, and research expenses
  - \$1K per year in discretionary funds for the awardee's department to enhance the research atmosphere within the department, plus \$1K per year in indirect costs
  - Eligibility:
    - Must have a tenure-track or tenured position at a US institution
    - Current record of active research and publication in high-quality journals
    - Not hold any other grants of over \$3K per year that include support for travel or visitors during the Collaboration Grant award period
  - Application deadline in late January

## Association for Women in Mathematics (AWM) grants

- **AWM Travel grants:**
  - Provides up to \$1,750 for domestic travel and of \$2,300 for foreign travel
  - Goal: Funds travel and subsistence for a meeting or conference in the applicant's field of specialization. Eligibility:
    - Not receiving more than \$2,000 in external governmental travel funds
    - Work address in the US
    - Applications due February 1, May 1, and October 1
- **AWM Mentoring Travel grants:**
  - Provides up to \$5K
  - Goal: Funds travel and accommodation for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month.
  - Eligibility:
    - Work address in the US
    - Applications due February 1

# National Security Agency (NSA)

- **Mathematical Sciences Program**
  - Support research in Algebra, Number Theory, Discrete Mathematics, Probability, and Statistics (but not cryptology)
  - Young Investigator, Standard, Senior, Conferences/Workshops/REUs grants
  - Young Investigator grant: up to \$20K per year for two years
  - Eligibility: US citizen or permanent residents
  - Application deadline is 15 October (awards are made in the following fall)
- **Sabbaticals Program**
  - Work with NSA scientists on analysis of data sets, cryptology, discrete mathematics, signals analysis, number theory, probability, statistics ...
  - Eligibility: US citizen

# National Science Foundation

NSF Division of Mathematical Sciences:  
<http://www.nsf.gov/div/index.jsp?div=DMS>

- **NSF Postdoctoral Fellowships**
- **Standard PI grants** in disciplinary programs: Algebra and Number Theory, Analysis, Applied Mathematics, ...
- CAREER grants ...
- Conference grants ...
- and many other types of grants ...

Most universities require that proposals are submitted internally to the Office of Sponsored Projects some time before the NSF deadline: at Brown, 6 business days before the deadline!

**Mathematical Sciences (DMS)**

Email Print Share

**MPS/DMS: Advice to PIs on Data Management**

NSF has published a revised version of the NSF Proposal and Award Policies and Procedures Guide (PAPPG) (NSF 11-1) that will require, in all proposals submitted, or due, on or after January 18, 2011, a supplementary document of no more than two pages describing a Data Management Plan for the proposed research. Fastlane will not permit submission of a proposal that is missing the Data Management Plan. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. The goal is to provide clear, effective, and transparent implementation of the long-standing NSF Policy on Dissemination and Sharing of Research Results.

Each Division within MPS has developed a set of information items to provide guidance to the communities served by that Division in preparing a Data Management Plan that will meet the goals of the NSF plan. For more information on the policy and process [click here](#).

For the NSF FAQs on this subject, [click here](#).

**Dear Colleague Letters**

- Dear Colleague Letter: DMS Funding Opportunities for Research in Hazards and Disasters (Hazard SEES) - [NSF 13-006](#)
- MPS Alliances for Graduate Education and the Professoriate - Graduate Research Supplements (AGEP-GRS) - [NSF 12-021](#)
- Computational and Data-Enabled Science and Engineering in Mathematical and Statistical Sciences - [NSF 12-018](#)
- CREATIV: Creative Research Awards for Transformative Interdisciplinary Ventures - [NSF 12-011](#)
- Division of Mathematical Sciences (DMS), Employment Opportunities for Program Directors - [DMS 12-001](#)
- Unsolicited Proposals at the Interface of the Biological, Mathematical and Physical Sciences, and Engineering - [NSF 12-057](#)
- Opportunities for the Mathematical and Physical Sciences in Earth System Modeling solicitation - [NSF 10-039](#)
- Broader Impacts Review Criterion - [NSF 07-046](#)
- Unsolicited proposals to the Dynamical Systems program in the Division of Civil, Mechanical and Manufacturing Innovation (ENG) and the Applied Mathematics program in the Division of Mathematical Sciences (MPS) addressing crosscutting topics in theory and application of dynamical systems - [NSF 08-079](#)

**Programs and Funding Opportunities**

Key: [Crosscutting](#) | [NSF-wide](#)

**Disciplinary Research Programs**

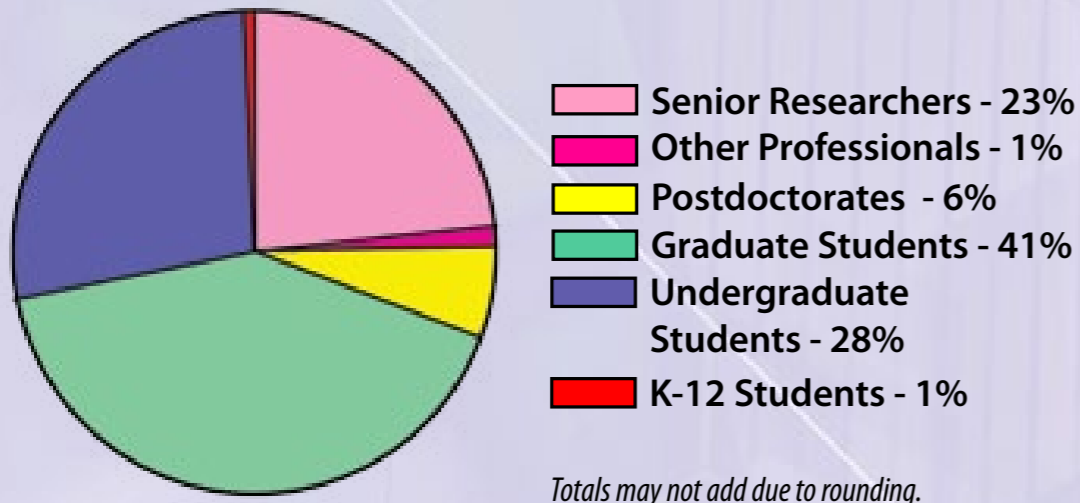
- [Algebra and Number Theory](#)
- [Analysis](#)
- [Applied Mathematics](#)
- [Combinatorics](#)
- [Computational Mathematics](#)
- [Foundations](#)
- [Geometric Analysis](#)
- [Mathematical Biology](#)
- [Probability](#)
- [Statistics](#)
- [Topology](#)

**Special Research Programs**

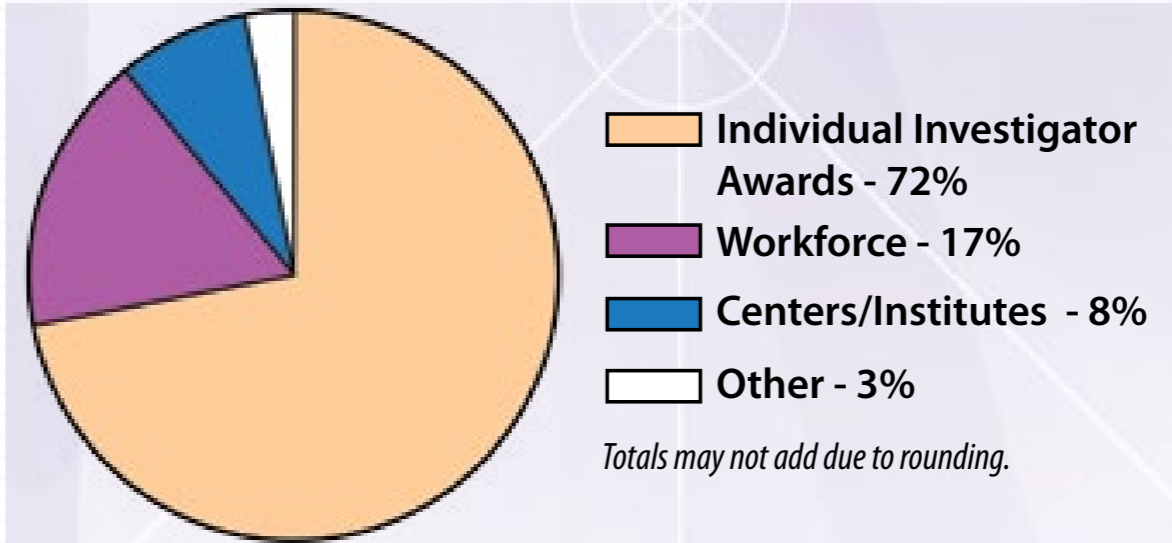
- [Research Networks in the Mathematical Sciences \(RNMS\)](#)
- [Focused Research Groups in the Mathematical Sciences \(FRG\)](#)
- [Joint DMS/NIGMS Initiative to Support Research at the Interface of the Biological and Mathematical Sciences \(DMS/NIGMS\)](#)
- [Algorithms for Threat Detection \(ATD\)](#)
- [Computational and Data-Enabled Science and Engineering in Mathematical and Statistical Sciences \(CDS&E-MSS\)](#)
- [Secure and Trustworthy Cyberspace \(SaTC\)](#)
- [Core Techniques and Technologies for Advancing Big Data Science & Engineering](#)

## Human Resources FY 2009

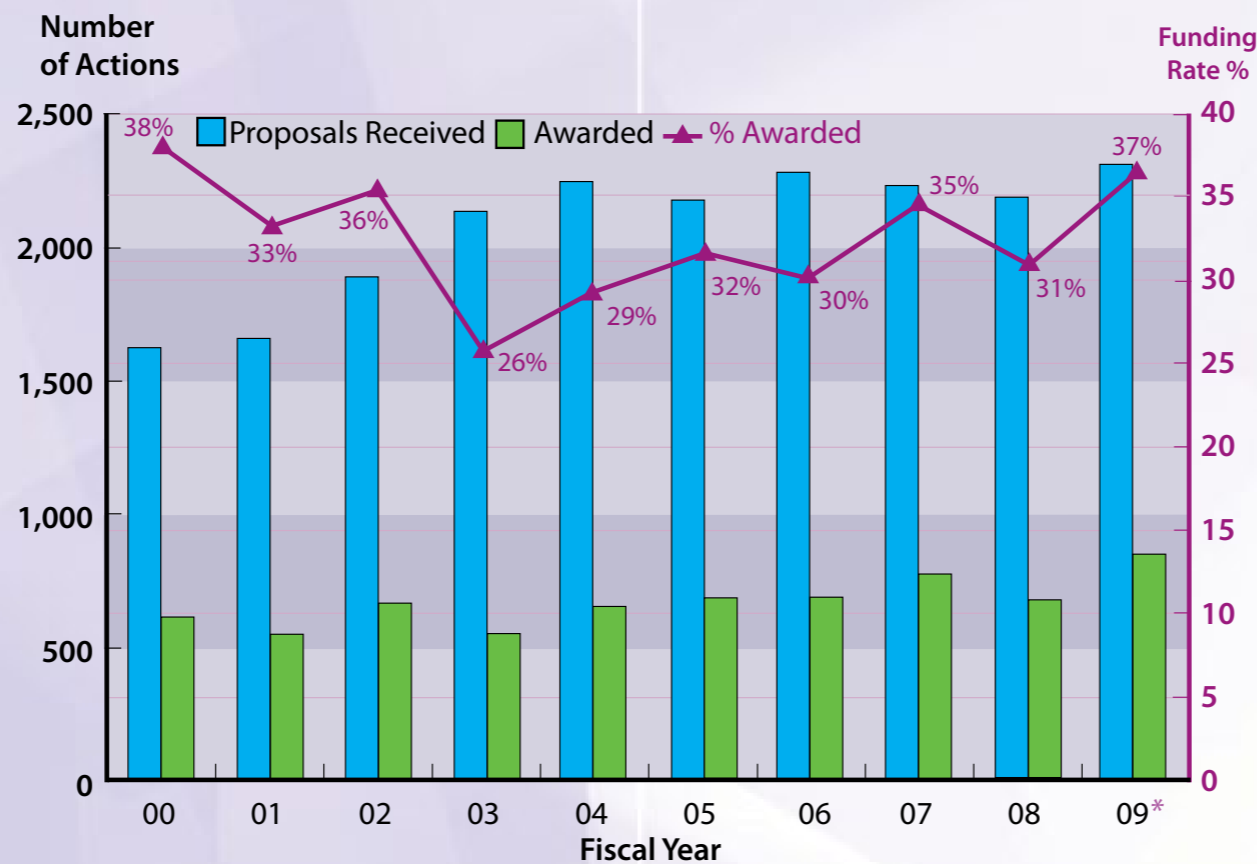
Pie chart showing total number of people involved in DMS.



## Modes of Support FY 2009



## Funding Rates and Number of Actions





## NSF postdoctoral fellowships

- Eligibility: US citizen, national or permanent resident
- Competitive and prestigious awards (around 30-33 awards made per year)
- Support for 2 years (but can be spread over 3 years and combined with teaching)
- Affiliated with US or international institutions and organizations
  
- Research program for 2-3 years
- Fit with career goals
- Match with sponsoring scientist and with host institution
  
- Proposal consists of
  - Summary (1 page)
  - Description (3-5 pages)
  - Biosketch (2 pages)
  - Sponsoring scientist statement
  - 3-4 letters of reference (including one from PhD advisor); sponsoring scientist cannot write
  
- Applications due in mid October

## NSF standard grants (usually 3 year duration)

- Proposal narrative ( $\leq 15$  pages)
- Proposal summary (1 page)
- Biosketch (2 pages)
- Budget
- Budget justification
- Current and pending support
- Data management plan
- Facilities, equipment, and other resources

The NSF Grant Proposal Guide outlines the rules for each of these sections: there are rules regarding format, font size, margins, content, ...

## Proposal review ...

- Two kinds of reviews:
  - mail reviews
  - panel reviews: reviewers may not be in your immediate or even broader field!
- Reviewers and panels make recommendations to program officers
- Program officers make recommendations to the Division of Mathematical Sciences
- Only NSF's Grants and Agreements Division can award grants

### Two review criteria:

- Intellectual merit: Scientific merits and your qualifications as researcher
- Broader impacts: **(must now be addressed in separate section in proposal narrative)**
  - Integration of research and education/training/mentoring
  - Plans to broaden participation of underrepresented groups?
  - Plans for broad dissemination?
  - Benefits to society?

It takes 6-8 months before you might hear from your program officer with a tentative decision

## How to write the proposal narrative ( $\leq 15$ pages) ...

- **Follow the guidelines!**
  - **Start early:** You will need at least 4-6 weeks to write a proposal
  - **Get feedback:** Ask mentors and colleagues to read your proposal (well before the deadline!)
  - **Write well:** Do not assume that reviewers will be familiar with your area
  - **Be persuasive:** Why should NSF fund this research? Why is your research important and why are you the person to carry out the proposed work?
- 
- Choose some projects that you know how to address and others that are more open-ended; illustrate your vision; avoid being incremental or too open-ended
  - Two bad extremes:
    - Long list of projects without any details (criticism: Do you have a plan for addressing them? What difficulties do you anticipate?)
    - Very short list of projects with many details (criticism: Is this enough for a 3-year grant?)
  - Motivate your projects: why are they important, what outcomes do you expect, how do you plan to approach them
  - Give background and review your recent work in the area
  - Address broader impacts explicitly in your proposal; also mention which projects will be worked on by undergraduate or graduate students

## Budget ...

- Salary (for up to two months)
- Support for graduate students and undergraduate summer research
- Travel to conferences
- Support for visitors
- Equipment such as computers
- Supplies

Key is to justify requests (name graduate students if known, list conferences you plan to attend, name visitors, justify need for new computers, justify requests for software, ...)