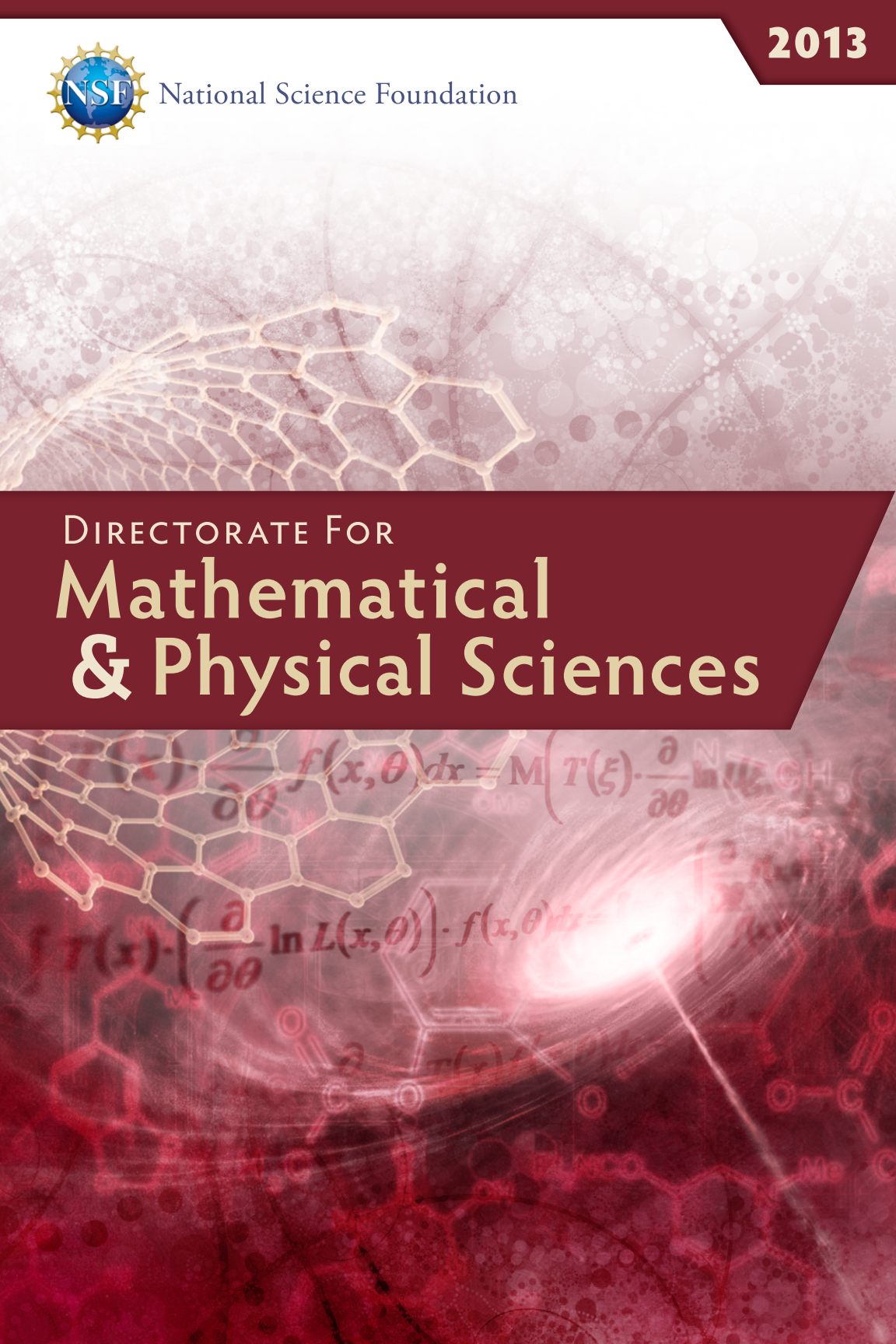
National Science Foundation

2013

Directorate For Mathematical & Physical Sciences



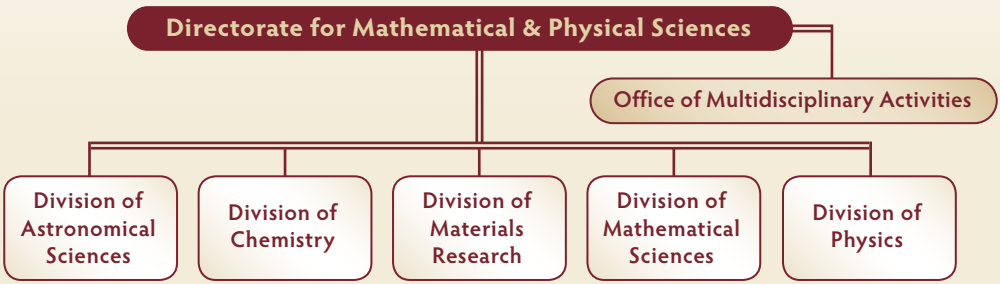
DIRECTORATE FOR

Mathematical & Physical Sciences

The NSF Directorate for Mathematical and Physical Sciences consists of the Divisions of Astronomical Sciences, Chemistry, Materials Research, Mathematical Sciences, and Physics, as well as the Office of Multidisciplinary Activities. These organizations constitute the basic structure for MPS support of research and education. The MPS Divisions support both disciplinary and interdisciplinary activities, and they partner with each other and with other NSF Directorates in order to effectively encourage basic research across the scientific disciplines.

MPS MISSION STATEMENT

The mission of MPS is to harness the collective efforts of the mathematical and physical sciences communities to address the most compelling scientific questions, educate the future advanced workforce, and promote discoveries to meet the needs of the Nation.



National Science Foundation

NSF MISSION

To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense (NSF Act of 1950)

NSF VISION

Advancing discovery, innovation, and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering.

Dear Reader:

We are pleased to tell you about the Mathematical and Physical Sciences Directorate (MPS) of the National Science Foundation. MPS supports fundamental advances in astronomy, chemistry, materials research, mathematical sciences, and physics. These activities both excite our imaginations and change our lives, providing a foundation for innovation that advances economic growth, public health, and national security.

With an FY 2012 budget exceeding $1.3 billion, MPS research spans the range of distances and times accessible to human investigation--lengths ranging from less than the diameter of an atom to the size of galaxies, and times ranging from those for the very fastest chemical reactions to those for the evolution of the universe. MPS research develops new mathematical structures and explores the behavior of the fundamental constituents of matter. The new insights that come from this research bear on exploration of complex biological systems, sustainability and the environment, and human and social dynamics. Just a few examples of the practical consequences of research in mathematical and physical sciences are the invention of medical imaging technology; the development of ultrasensitive biological and chemical detectors; advances in alternate fuel technologies; and transformations in electronics, photonics, and optics.

Research in the mathematical and physical sciences is the bedrock of technological innovation. In the next few years, MPS-funded research will advance the nation's investments in sustainable energy and food supplies, cyberinfrastructure, and the rapid incorporation of newly invented materials into practical devices at low cost. We will support research that connects the life sciences to the mathematical and physical sciences; that enhances the nation's wireless communications infrastructure; and that reveals the very nature of matter, space, time and the physical laws governing the universe.

We hope this brochure gives you a flavor of the research we support at universities and laboratories throughout the nation, and we invite you to learn more about us on our web site at **www.nsf.gov/MPS.**

Best regards,

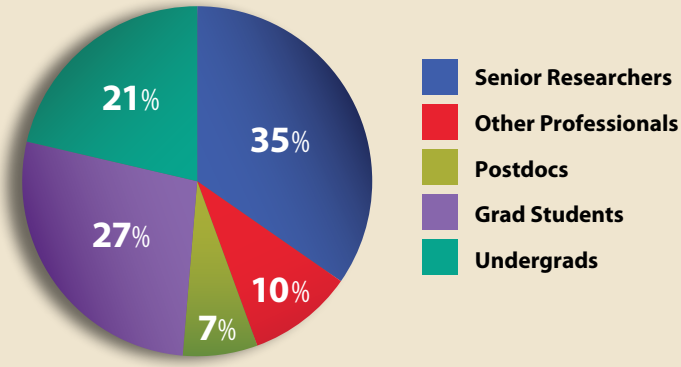
F. Fleming Crim

F. Fleming Crim
Assistant Director
Directorate for Mathematical and Physical Sciences

Directorate for Mathematical & Physical Sciences

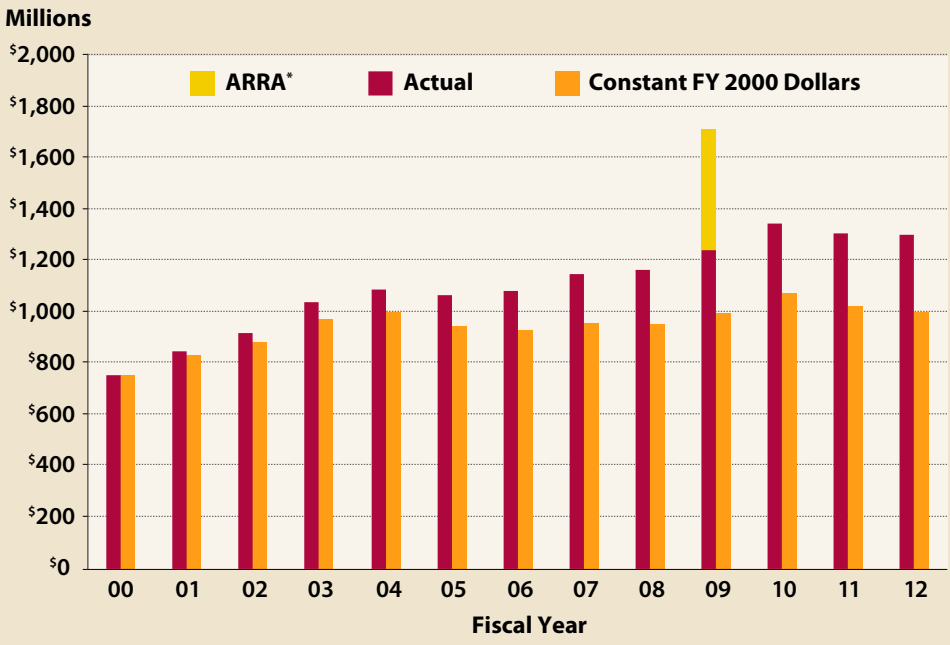
HUMAN RESOURCES FY 2012

Distribution of people supported by MPS.



BUDGET IN ACTUAL AND CONSTANT FY 2000 DOLLARS

Constant dollars show the purchasing power of the MPS budget.

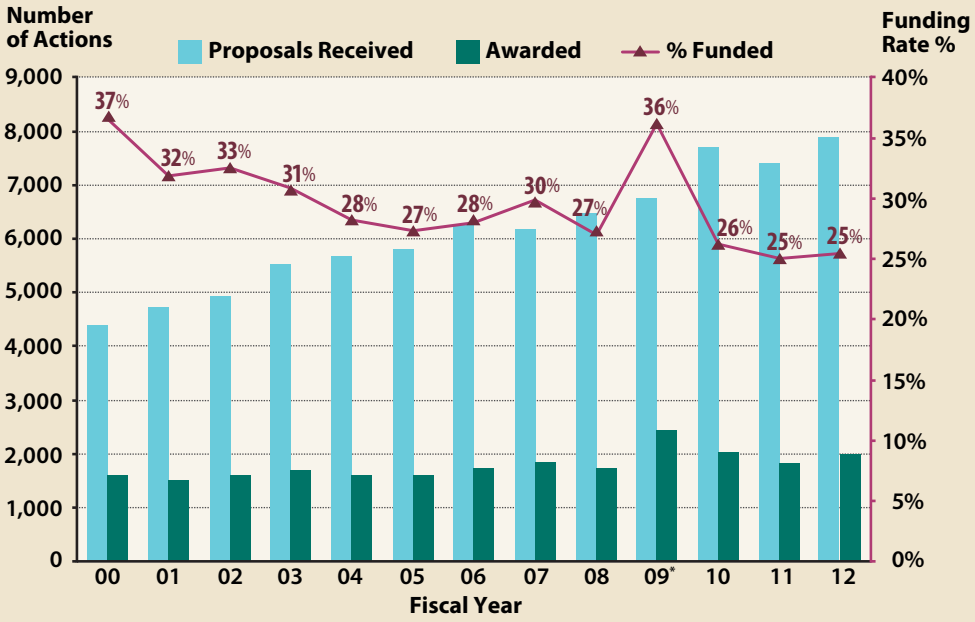


* ARRA - American Recovery and Reinvestment Act of FY 2009.

Data provided from FY 2000 to 2012 NSF Budget Requests to Congress, www.nsf.gov/about/budget

FUNDING RATES AND NUMBER OF ACTIONS

Graph shows number of proposals submitted and awarded Research Grants (as defined by NSF) and resultant funding rates. Funding rate is defined as the percentage of new or renewal proposals awarded funding.



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

Note: The funding reflects the average for the Directorate and may not represent funding rates in individual Divisions or programs

Division of Astronomical Sciences (AST)

Mission

The mission of the Division of Astronomical Sciences (AST) is to support forefront research in ground-based astronomy; to help ensure the scientific excellence of the U.S. astronomical community; to provide access to world-class research facilities through merit review; to support the development of new instrumentation and next-generation facilities; and to encourage broad understanding of the astronomical sciences by a diverse population of scientists, policy makers, educators, and the public at large.

The Division supports research in all areas of astronomy and astrophysics as well as related multidisciplinary studies. Because of the scale of modern astronomical research, the Division engages in numerous interagency and international collaborations. Areas of emphasis and the priorities of specific programs are guided by community recommendations, which have been developed and transmitted by National Research Council decadal surveys and by federal advisory committees.

Astronomical Facilities

The Division invested 57% of its FY 2012 appropriation in the management and operation of ground-based astronomical facilities. Through the national observatories and international partnerships, the Division provides support for a system of multi-aperture research-class telescopes that enable transformational capabilities in both radio and optical/infrared astronomy. In 2012, the upgraded Karl G. Jansky Very Large Array was completed, and in 2013, the international Atacama Large Millimeter/submillimeter Array was inaugurated. During FY 2013, ground was also broken on the Advanced Technology Solar Telescope, a part of the National Solar Observatory to be constructed on Haleakalā Mountain in Hawaii. Furthermore, technological advances in a number of key areas of telescope construction and design, including sophisticated adaptive optics technology at the Gemini Observatory and the Advanced Technology Solar Telescope, allow these and other national facilities to operate at the forefront of ground-based capabilities.

Credit: NRAO/AUI, NSF, ESO, and NAOJ.

The Atacama Large Millimeter/submillimeter Array (ALMA) was inaugurated and will go into full operation in 2013. ALMA will function as the most capable imaging radio telescope ever built. This image shows a subset of ALMA's 66 antennas in operation at 5000 meters elevation in the Chilean Andes, with the plane of the Milky Way Galaxy crossing the sky in the background.

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INDIVIDUAL INVESTIGATOR PROGRAMS

- Astronomy and Astrophysics Research Grants (**AAG**)
- Enhancing Access to the Radio Spectrum (**EARS**)
- Faculty Early Career Development Program (**CAREER**)
- NSF Astronomy and Astrophysics Postdoctoral Fellowships (**AAPF**)
- Partnerships in Astronomy and Astrophysics Research and Education (**PAARE**)
- Research Experiences for Undergraduates (**REU**)
- Research in Undergraduate Institutions (**RUI**)
- Theoretical and Computational Astrophysics Networks (**TCAN**)

ASTRONOMICAL INSTRUMENTATION PROGRAMS

- Advanced Technologies and Instrumentation (**ATI**)
- Major Research Instrumentation (**MRI**)

LARGE FACILITIES

- Arecibo Observatory
- Atacama Large Millimeter/submillimeter Array (**ALMA**)
- Gemini Observatory
- National Optical Astronomy Observatory
- National Radio Astronomy Observatory
- National Solar Observatory

Credit: Dark Energy Survey Collaboration

Optical image of the galaxy NGC 1365 in the Fornax Cluster, taken by the Dark Energy Camera (funded by the Department of Energy) installed on the Blanco 4-meter telescope of the National Optical Astronomy Observatory. The image covers only a very small portion of the field of view of the camera. The Dark Energy Survey, using this telescope/camera combination, begins in 2013 and will continue for a five-year primary mission.

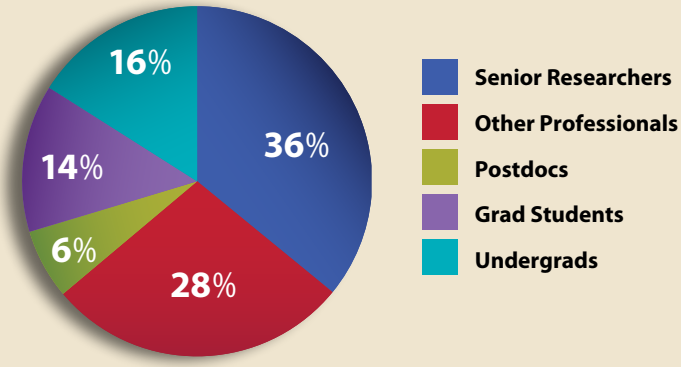
ELECTROMAGNETIC SPECTRUM MANAGEMENT (ESM)

AST represents the interests of NSF and the scientific community in protecting access to portions of the electromagnetic spectrum that are needed for research purposes. The sensitivity of telescopes can be compromised by electromagnetic interference from sources such as airborne and satellite radio transmissions and light pollution. ESM personnel protect scientific capabilities by participating in the establishment of regulations, operating procedures, and technical standards related to government, private sector, and international uses of the spectrum. The ESM unit also is the home of the research program Enhancing Access to the Radio Spectrum (EARS), which seeks to optimize the use of the radio spectrum for a variety of societal needs.

Division of Astronomical Sciences (AST)

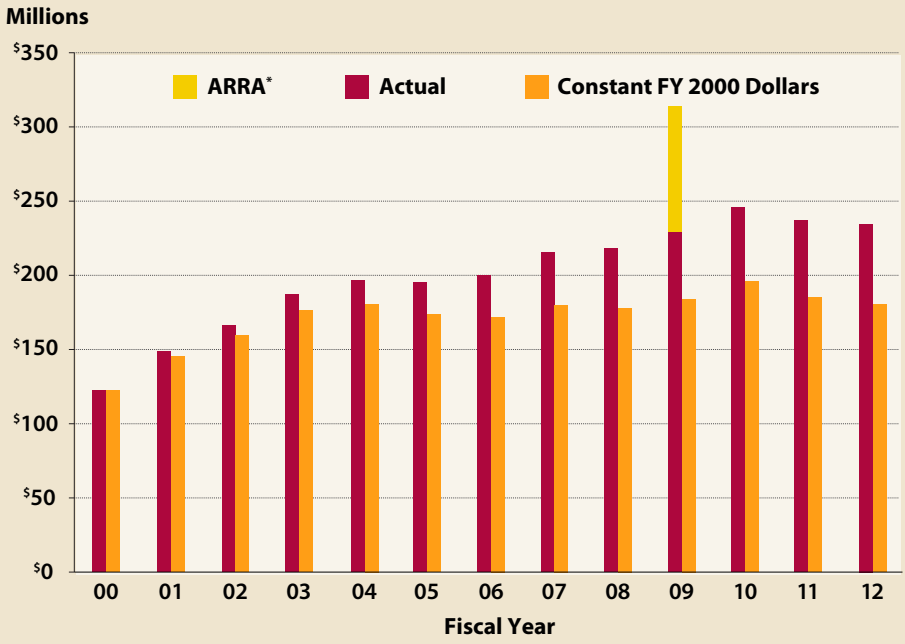
HUMAN RESOURCES FY 2012

Distribution of people supported by AST.



BUDGET IN ACTUAL AND CONSTANT FY 2000 DOLLARS

Constant dollars show the purchasing power of the AST budget.



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FUNDING RATES AND NUMBER OF ACTIONS

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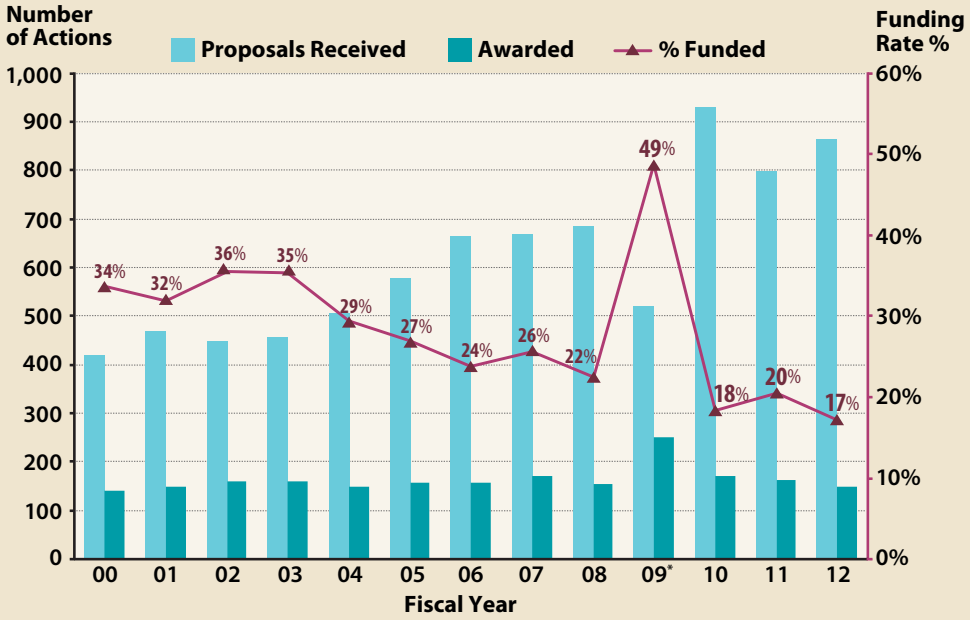

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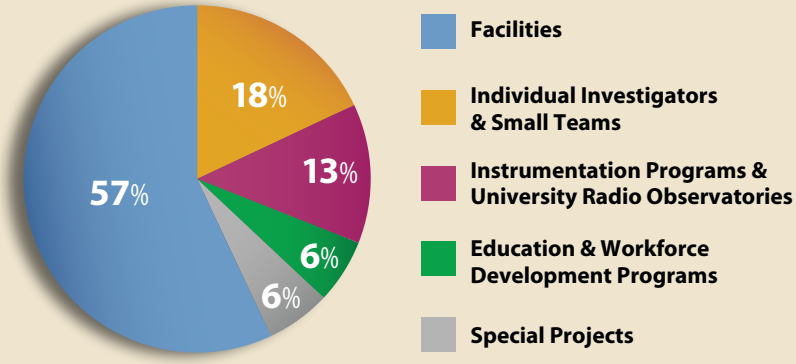
MODES OF SUPPORT FY 2012



Division of Chemistry (CHE)

Mission

The mission of the NSF Division of Chemistry (CHE) is to support innovative research in chemical sciences, integrated with education, through strategic investment in developing a globally engaged U.S. chemistry workforce reflecting the diversity of America.

Funding Modalities

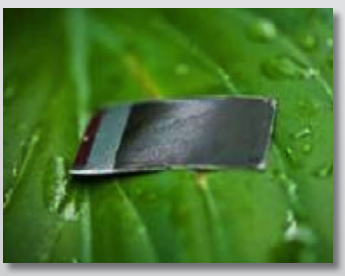
Research projects (individual investigators and small teams) remain the dominant funding modality in CHE, accounting for 84% of the Division's budget in FY 2012. CHE also invests in research centers (6%), shared instrumentation (6%), and education (4%).

Workforce Development and Broadening Participation

CHE supports roughly 75 Research Experiences for Undergraduates (REU) sites, which represent many different models of undergraduate research. An exciting part of the portfolio is the international REU Sites, where U.S. undergraduate students have the opportunity to live and conduct research abroad for eight to ten weeks. CHE supports international (iREU) sites in Europe and Asia.

Chemistry and the Global Community

CHE has developed effective partnerships with select funding agencies in other countries that allow joint review and funding of collaborative international research projects. Proposals submitted to the "International Collaboration in Chemistry" program enable graduate students, postdocs, and undergraduate students to participate in extended research visits to their collaborators' laboratories abroad. The program also encourages the development and use of cyber infrastructure to enhance the partnerships supported.



Credit: Dan Nocera, MIT

A silicon photovoltaic cell (the artificial leaf). The photovoltaic cell can capture the energy of sunlight and use that energy to do a chemical reaction - the splitting of water into hydrogen (a fuel) and oxygen.

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INDIVIDUAL INVESTIGATOR PROGRAMS

- Chemical Catalysis
- Chemical Measurement and Imaging
- Chemical Structure, Dynamics and Mechanisms
- Chemical Synthesis
- Chemistry of Life Processes
- Chemical Theory, Models and Computational Methods
- Environmental Chemical Sciences
- Macromolecular, Supramolecular and Nanochemistry

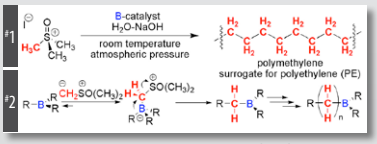
INTEGRATIVE CHEMISTRY ACTIVITIES

- Centers for Chemical Innovation
- Chemical Research Instrumentation and Facilities
- Research Experiences for Undergraduates

The **Centers for Chemical Innovation (CCI)** Program supports centers focused on major, long-term fundamental chemical research challenges. CCIs that address these challenges will produce transformative research, lead to innovation, and attract broad scientific and public interest.

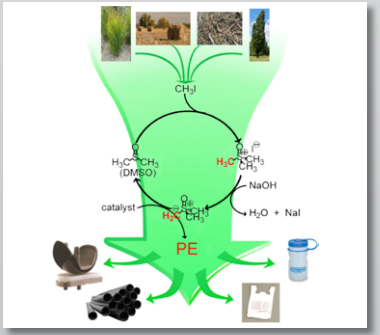
One of the Division's priorities is the NSF-wide program in **Sustainable Chemistry, Engineering and Materials (SusChEM)**. Proposals are supported by all modalities including the individual investigator programs. The division will support basic research in SusChEM to:

- Discover new chemistry that will replace rare, expensive and/or toxic chemicals with earth-abundant, inexpensive and benign chemicals.
- Discover new chemistry to economically recycle chemicals that can not be replaced, such as phosphorus and the rare earth elements.
- Discover new chemistry to convert non-petroleum based sources of organics to feedstock chemicals.
- Discover new environmentally friendly chemical reactions and processes that require less energy, water, and organic solvents than current practice.



Credit: Jun Luo; Kenneth J. Shea, University of California, Irvine

UPPER IMAGE: (#1) **Illustration of an energy-saving process for the conversion of a trimethylsulfoxonium iodide salt to polymethylene in water.** (#2) **Mechanism for the polymer production**



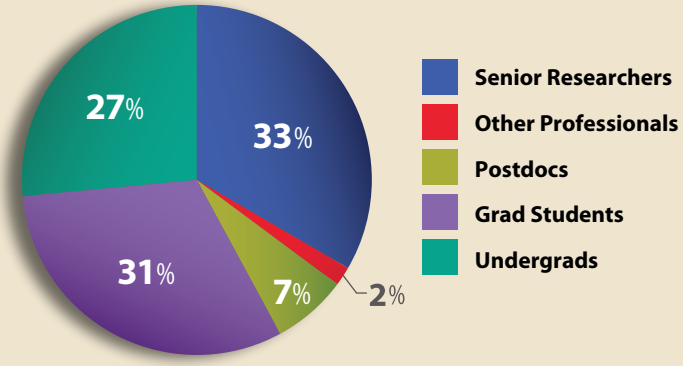
Credit: Jun Luo; Kenneth J. Shea, University of California, Irvine

LOWER IMAGE: **Catalytic cycle for the conversion of non-food biomass (switch grass, corn stover, sugar cane bagasse, poplar, etc.) to the most important synthetic polymer PE, used for products ranging from joint implants to shopping bags.**

Division of Chemistry (CHE)

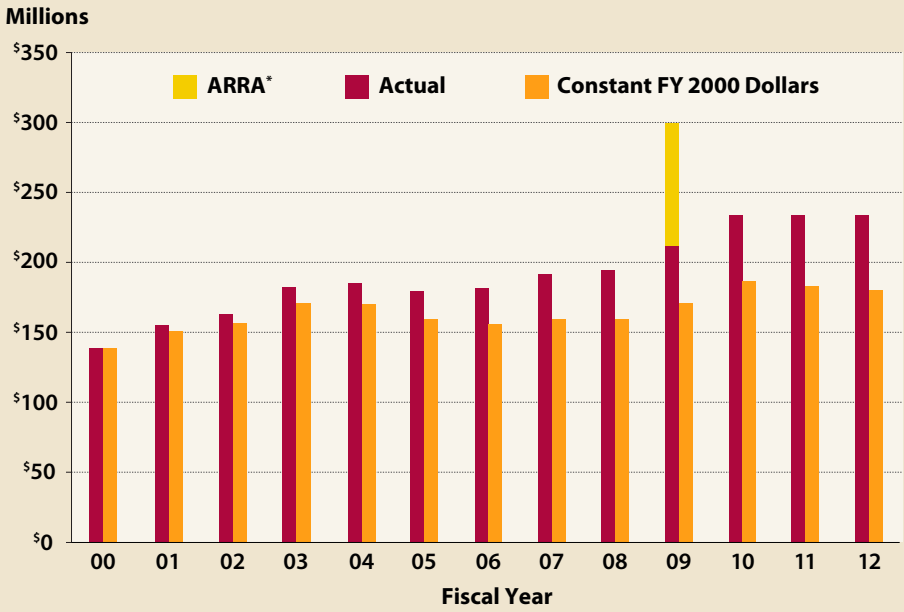
HUMAN RESOURCES FY 2012

Distribution of people supported by CHE.



BUDGET IN ACTUAL AND CONSTANT FY 2000 DOLLARS

Constant dollars show the purchasing power of the CHE budget.



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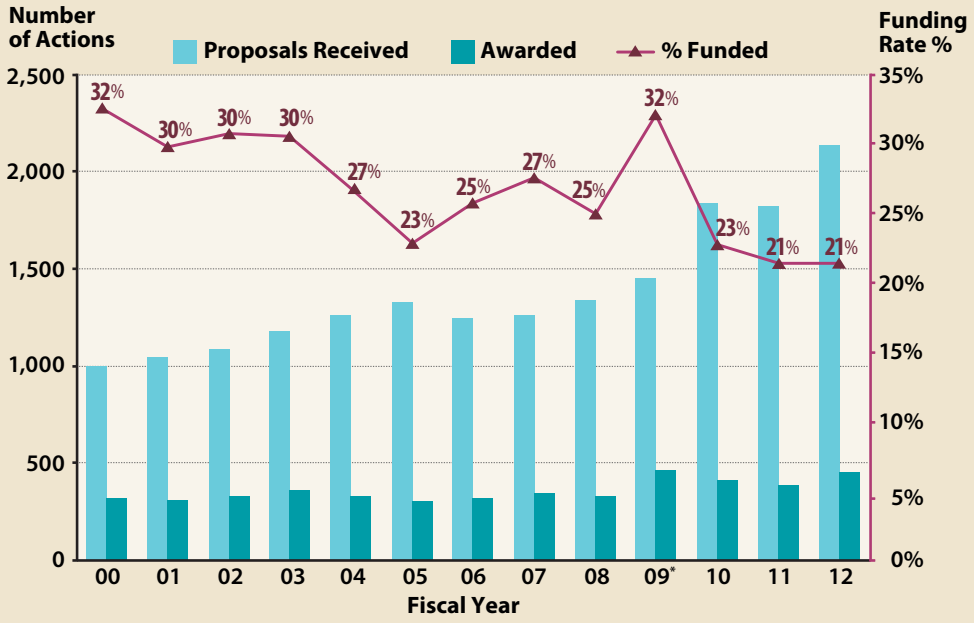

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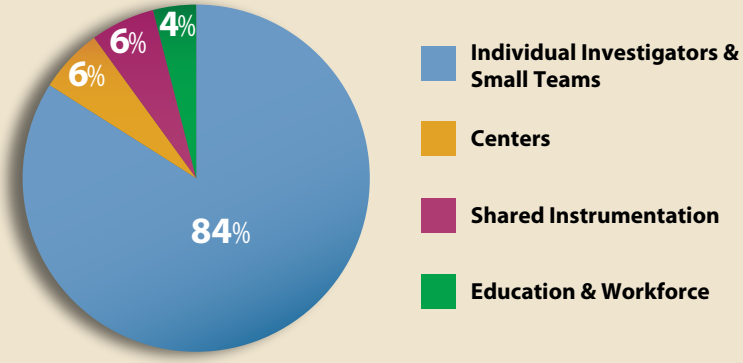
MODES OF SUPPORT FY 2012



Division of Materials Research (DMR)

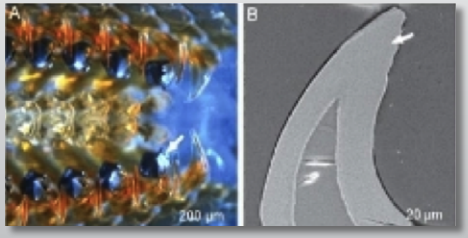
Mission

The mission of the Division of Materials Research (DMR) is to make new discoveries about the behavior of matter and materials and new knowledge about materials phenomena; to address fundamental materials questions that often transcend traditional scientific and engineering disciplines and may lead to new technologies; to prepare the next generation of materials researchers; to develop and support the instruments and facilities that are crucial to advance the field; and to share the excitement and significance of materials science with the general public.

DMR supports experimental and theoretical research, their interplay with each other and with data, over a broad range of subfields. These include condensed matter and materials physics, solid state and materials chemistry, electronic and photonic materials, metals and metallic nano structures, polymers, ceramics, and biomaterials. Funding modes range from awards to individual investigators, to small groups to centers, instrumentation, and major facilities.

Workforce Development and Broadening Participation

DMR strives to broaden the participation of women and underrepresented minority groups in science and engineering at all academic levels. One outcome of this vision is the Partnership for Research and Education in Materials (PREM) program, which develops and supports long-term partnerships between academic institutions serving underrepresented groups and DMR centers and facilities. PREM was started in 2004 and currently supports 14 awards.



Credit: Derk Joester

Using a new technique called "atom probe tomography," researchers at Northwestern University observed that chitons, "rock-munching" marine mollusks, have teeth that are four times harder than human teeth that are self-sharpening. Structural studies revealed that these teeth are composites of nanocrystalline magnetic iron oxide with organic fibers. Understanding the structures of these interesting materials will allow researchers to design new synthetic materials for unprecedented hardness and function.

Contact Information

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PROGRAMS FOR INDIVIDUAL INVESTIGATORS AND GROUPS

- Biomaterials
- Ceramics
- Computational and Data-Driven Materials Research
- Condensed Matter and Materials Theory
- Condensed Matter Physics
- Electronic and Photonic Materials
- Metallic Materials and Nanostructures
- Polymers
- Solid State and Materials Chemistry

CROSSCUTTING DMR PROGRAMS

Materials Research Science and Engineering Centers

(MRSECs): MRSECs address fundamental materials research whose scope and complexity require the advantages of scale and interdisciplinarity provided by a center. The MRSEC program currently supports 27 centers. For more information, visit www.mrsec.org

Partnerships in Research and Education in Materials (PREM)

National Facilities

DMR supports facilities for neutron scattering, x-rays, high magnetic fields, and nanofabrication.

Office of Special Programs

The Materials World Network (MWN): The MWN, initiated and supported by DMR in partnership with over fifty research funding organizations worldwide, engages global resources for the advancement of materials research and education through collaborative projects.

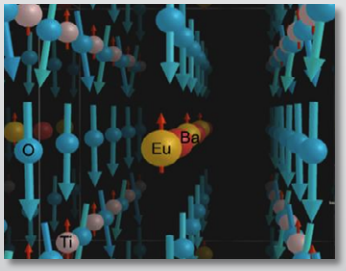
Research Experience for Undergraduates (REU) and Teachers (RET)

Designing Materials to Revolutionize and Engineer our Future (DMREF)

DMR participates in the DMREF activity, which encourages proposals that integrate experimental, theoretical and data-driven efforts and that iterate these steps to achieve more rapid materials discovery.

Sustainable Chemistry, Engineering and Materials (SusChEM)

DMR also participates in the SusChEM activity for research that extends natural resources, replaces materials for a safer and more secure future, and designs materials for zero waste.



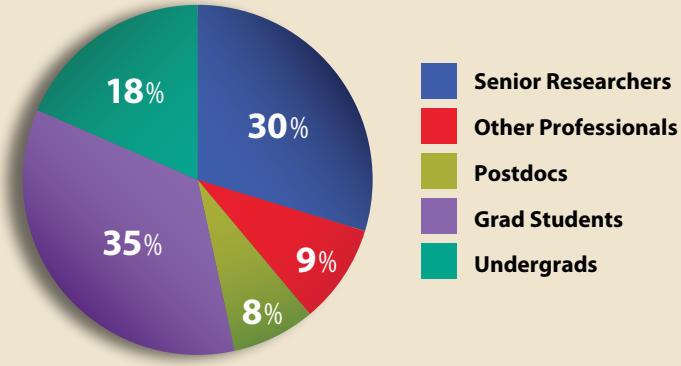
Credit: Nicola Spaldin

Researchers at the University of California–Santa Barbara designed a material for its magnetic properties starting from constituent atoms in a successful example of materials by design. The image shows how the atoms of europium (Eu), barium (Ba), oxygen (0), and titanium (Ti), are arranged on a crystalline lattice of the material.

Division of Materials Research (DMR)

HUMAN RESOURCES FY 2012

Distribution of people supported by DMR.



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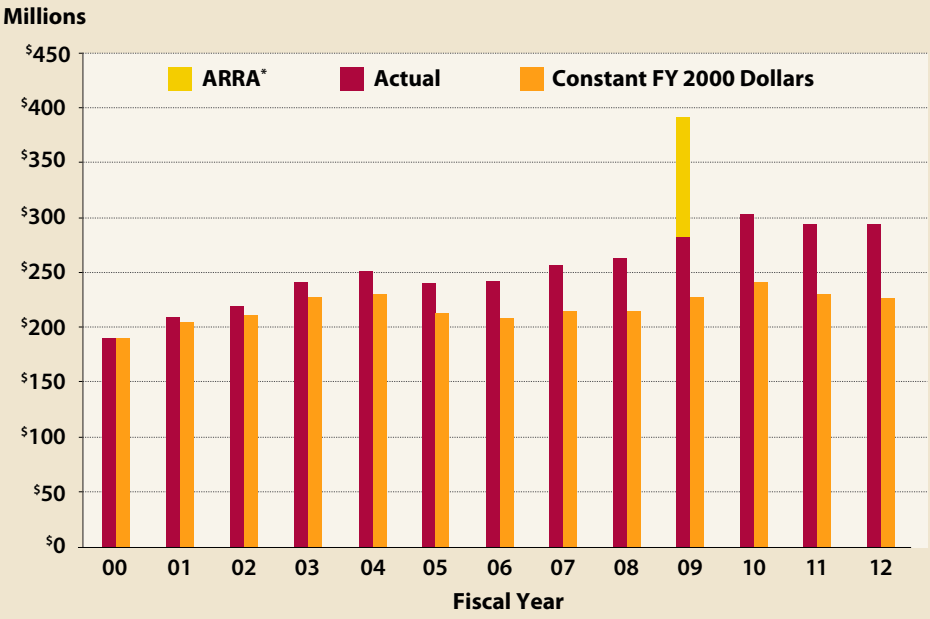

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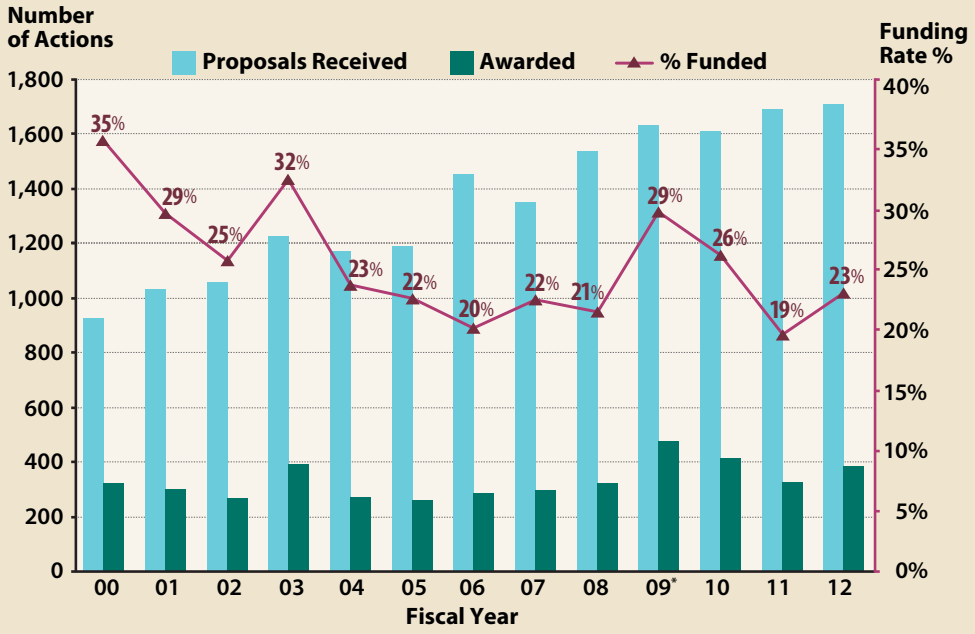

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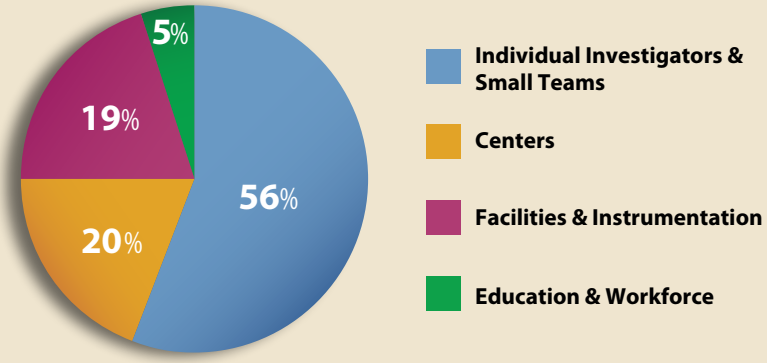
MODES OF SUPPORT FY 2012



Division of Mathematical Sciences (DMS)

Mission

The mission of the NSF Division of Mathematical Sciences (DMS) is to support research at the frontiers of discovery in mathematical sciences and to support education in the mathematical sciences through research involvement of trainees. DMS is responsible for programs with a total annual budget of over $230 million. These programs support research and education that expand the knowledge base of the mathematical and statistical sciences through awards to individual investigators and small groups, workforce training grants, and a portfolio of national mathematical sciences research institutes.

Discovery, Connections, Community

The influence of mathematical sciences 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. Additionally, improvements in weather prediction, search engines, and industrial design processes rest 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, and professionals.

The Division's top investment priorities – discovery, connections, and community – are essential components of the innovation engine that drives the nation's economy in the 21st Century.

New Initiatives

DMS continues to develop interdisciplinary activities that reflect national priorities. Successful multi-agency programs such as Algorithms for Threat Detection and the Joint DMS & National Institute of General Medical Sciences Activity in Mathematical Biology are continuing, and newer DMS activities such as the Computational and Data-Enabled Science and Engineering in Mathematical and Statistical Sciences program are attracting broad interest from the mathematical sciences community. The DMS Workforce Program in the Mathematical Sciences offers competitions such as Expeditions in Training, Research, and Education for Mathematics and Statistics through Quantitative Explorations of Data, whose goal is to increase the number of well-prepared students who pursue careers in the mathematical sciences and in other NSF-supported disciplines. Additionally, NSF-wide programs in Cyberinfrastructure Framework for the 21st Century; Materials Genome Initiative; and Science, Engineering, and Education for Sustainability are providing new opportunities for engagement of the mathematical sciences community.

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CORE PROGRAMS

- Algebra and Number Theory
- Analysis
- Applied Mathematics
- Combinatorics
- Computational Mathematics
- Foundations
- Geometric Analysis
- Mathematical Biology
- Probability
- Statistics
- Topology

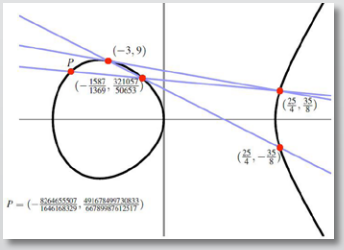
SPECIAL DMS PROGRAMS

- Algorithms for Threat Detection
- Computational and Data-Enabled Science and Engineering in Mathematical and Statistical Sciences
- Focused Research Groups in the Mathematical Sciences
- Infrastructure
- Joint DMS/NIGMS Initiative in Mathematical Biology
- Research Networks in the Mathematical Sciences
- Workforce Program in the Mathematical Sciences

The Mathematical Sciences Research Institutes program supports 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.

MATHEMATICS RESEARCH COMMUNITIES

The Mathematics Research Communities (MRC) Program, run by the American Mathematical Society and supported by DMS, helps cement new research collaborations through targeted summer conferences, Special Sessions at the Joint Mathematics Meetings, private online discussion networks, and mentoring by senior mathematicians. Ongoing collaborations of MRC alumni include small groups of MRC participants working together, individual participants working with senior mentors from the MRC program, and groups of MRC participants and organizers getting together for workshops to share ideas and explore new avenues.
www.ams.org/programs/research-communities/mrc



Credit: Karl Rubin, University of California, Irvine

ELLIPTIC CURVES: Mathematics is the study of patterns and relationships. Mathematical concepts are used to describe and understand the world, and abstract mathematical reasoning surprisingly often underlies human progress. The curve pictured here is an example of a mathematical construct in algebra, geometry, and number theory. Such elliptic curves play a role in the proof of Fermat's last theorem, and they underlie some modern public-key cryptosystems used for secure Internet commerce. The figure illustrates geometrically a fundamental algebraic computation central to the elliptic curve cryptography scheme endorsed by the U.S. National Security Agency.

Credit: Ellen Maycock and David Eisenbud

MRC participants and organizer Claudia Polini working on a project at the 2010 MRC Conference in Commutative Algebra.

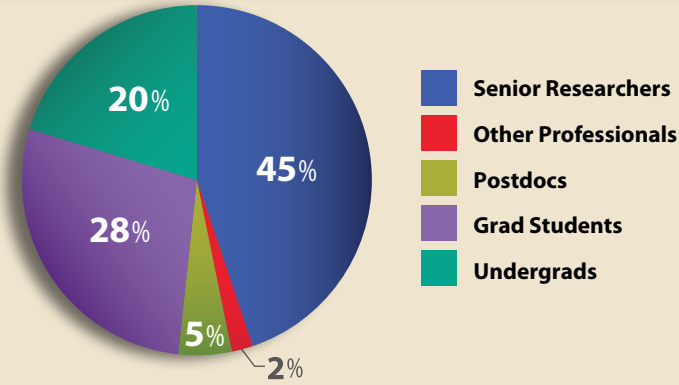
Credit: Ellen Maycock and David Eisenbud

MRC participants working on a project at the 2008 MRC conference on Scientific Computing and Advanced Computation.

Division of Mathematical Sciences (DMS)

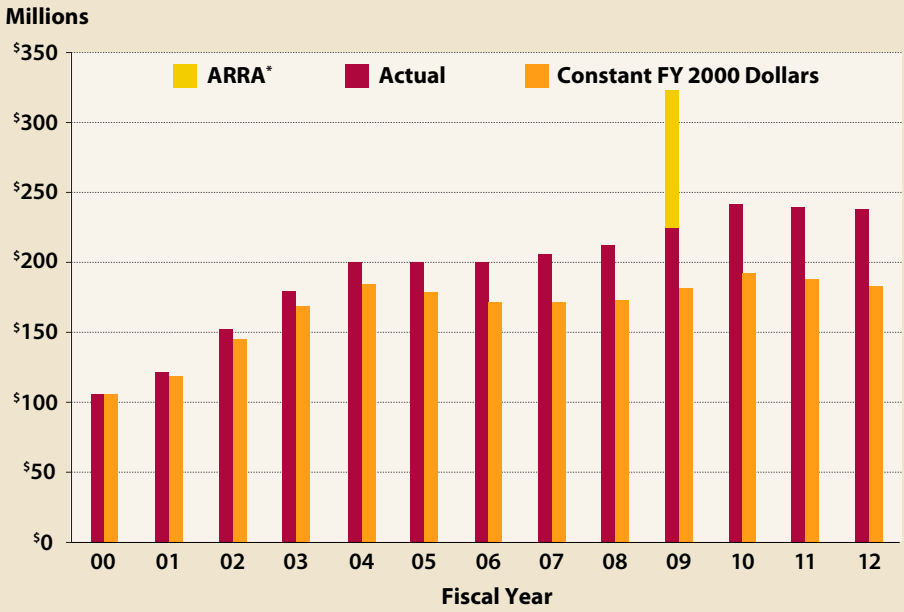
HUMAN RESOURCES FY 2012

Distribution of people supported by DMS.



BUDGET IN ACTUAL AND CONSTANT FY 2000 DOLLARS

Constant dollars show the purchasing power of the DMS budget.

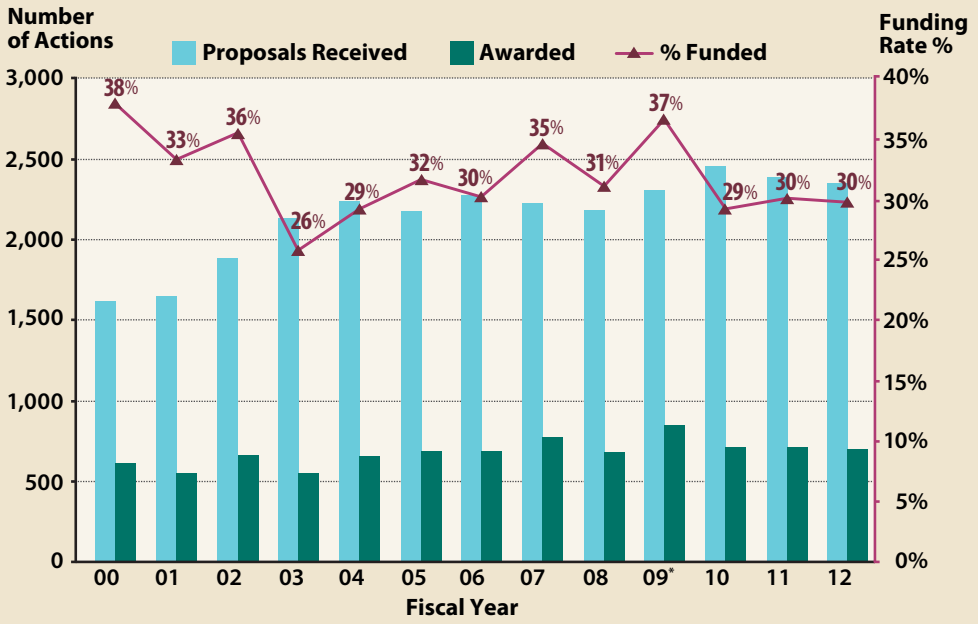


* ARRA - American Recovery and Reinvestment Act of FY 2009.

Data provided from FY 2000 to 2012 NSF Budget Requests to Congress, www.nsf.gov/about/budget

FUNDING RATES AND NUMBER OF ACTIONS

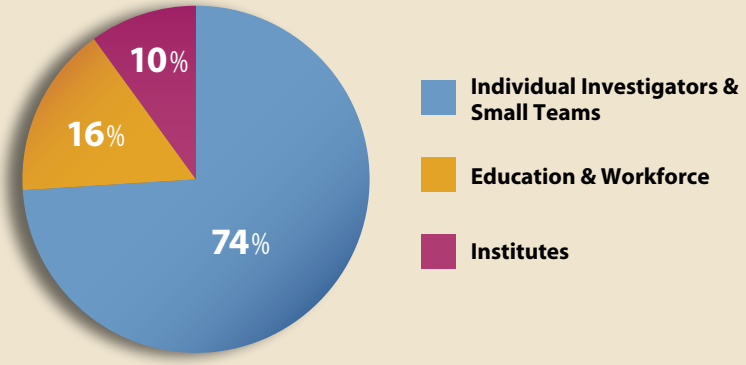
Graph shows number of proposals submitted and awarded Research Grants (as defined by NSF) and resultant funding rates. Funding rate is defined as the percentage of new or renewal proposals awarded funding.



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

Note: The funding reflects the average for DMS and may not represent funding rates in individual programs

MODES OF SUPPORT FY 2012



Division of Physics (PHY)

Mission

The mission of the Division of Physics (PHY) is to support fundamental research across the intellectual frontiers of physics, to support research that has broader impacts on other fields of science and on the health, economic strength, and defense of society, to enhance education at all levels and share the excitement of science with the public through integration of education and research, and to steward the physics community so as to maintain the intellectual capital essential for future advances.

Physics research probes the properties of matter at its most fundamental level, the interactions between particles, and the organization of constituents and symmetry principles that lead to the rich structure and phenomena that we observe in the world around us. Physics seeks a deep understanding of processes that led to the formation of the cosmos, to the structure of matter at the very shortest distance scales where quantum effects dominate, and to the structure of atomic and molecular systems that shape and control the everyday world of chemistry and biological systems.

Workforce Development and Broadening Participation

The Physics Division strongly supports workforce development and broadening participation at all levels, from outreach efforts in large facilities and centers, to a variety of opportunities for undergraduates through the REU program, to large-scale projects such as QuarkNet (an outreach program that connects cutting-edge physics to the high school classroom), to individual PI awards. Students involved in these projects gain skills and knowledge to become members of the nationally critical high tech workforce.

PROGRAMS FOR INDIVIDUAL INVESTIGATORS AND GROUPS

- **Atomic, Molecular, Optical and Plasma Physics**
- **Physics of Living Systems**
- **Accelerator Science**
- **Elementary Particle Physics**
- **Gravitational Physics**
- **Nuclear Physics**
- **Particle Astrophysics**
- **Physics at the Information Frontier**
- **Education and Interdisciplinary Research**
- **Theoretical Physics** (including Atomic, Molecular, and Optical Physics, Elementary Particle Physics, Nuclear Physics, Cosmology and Astrophysics, and Mathematical Physics)

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Dr. Bradley D. Keister
Deputy Division Director
(Acting)

National Science Foundation
Division of Physics
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FAX: **(703) 292-9078**
WEB: **www.nsf.gov/PHY**

CROSSCUTTING PHYSICS PROGRAMS

- **Physics Frontier Centers**
- **National Facilities**
  - National Supercomputing Cyclotron Laboratory (NSCL)
  - Laser Interferometer Gravitational Wave Observatory (LIGO)
  - Large Hadron Collider (LHC), a joint NSF-DOE-CERN project
  - IceCube Neutrino Observatory
  - Large Plasma Device (LAPD)
- **Research Experience for Undergraduates (REU) and Teachers (RET)**

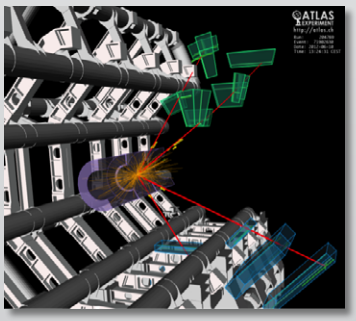
THE PHYSICS FRONTIER CENTERS

This program has been established to foster major advances at the intellectual frontiers of physics by providing needed resources, including combinations of talents, skills, disciplines, and/or specialized infrastructure, not usually available to individual investigators or small groups.

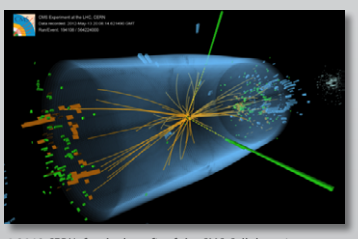
The program supports university-based centers and institutes where the collective efforts of a larger group of individuals can enable transformational advances in the most promising research areas. Activities supported through the program are in all sub-fields of physics within the purview of the Division of Physics. Interdisciplinary projects at the interface between these physics areas and other physics sub-fields and disciplines, such as quantum information science, mathematical physics, and condensed matter physics, and emerging areas of physics are also included.

PHYSICS AND THE GLOBAL COMMUNITY

The PHY Division participates in numerous international efforts, including large scale facilities such as the LIGO, LHC and IceCube facilities, and large astrophysics detectors such as Borexino, and the Pierre Auger Observatory. In addition, the PHY Division also participates in the Open Science Grid, a distributed shared cyberinfrastructure which provides computing and storage resources for large NSF supported international projects and partners internationally with other grid projects in Europe and releated efforts in South America and Asia.



ATLAS Experiment ©2012 CERN



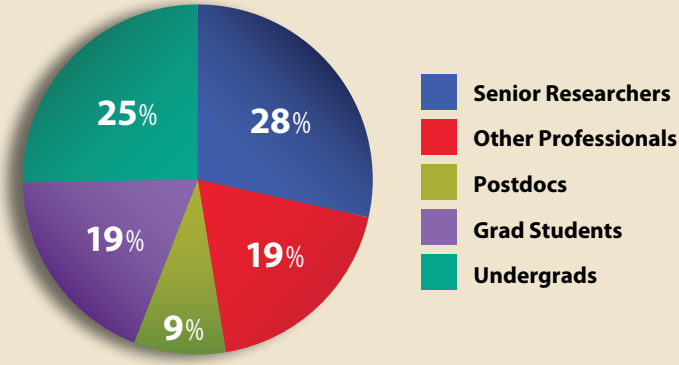
©2012 CERN, for the benefit of the CMS Collaboration

Displays of candidate Higgs Boson events from the ATLAS and CMS Experiments at the CERN Large Hadron Collider: (upper) Higgs decay into 4 muons in the ATLAS Detector with muon tracks colored in red; (lower) Higgs decay into a pair of photons in the CMS Detector with photons indicated by dashed yellow lines and green towers.

Division of Physics (PHY)

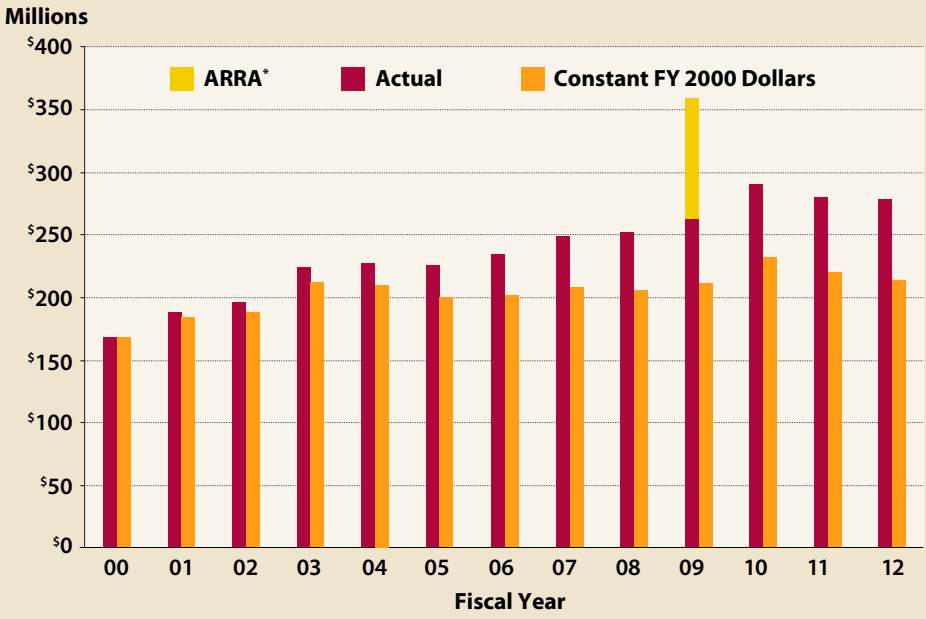
HUMAN RESOURCES FY2012

Distribution of people supported by PHY.



BUDGET IN ACTUAL AND CONSTANT FY 2000 DOLLARS

Constant dollars show the purchasing power of the PHY budget.



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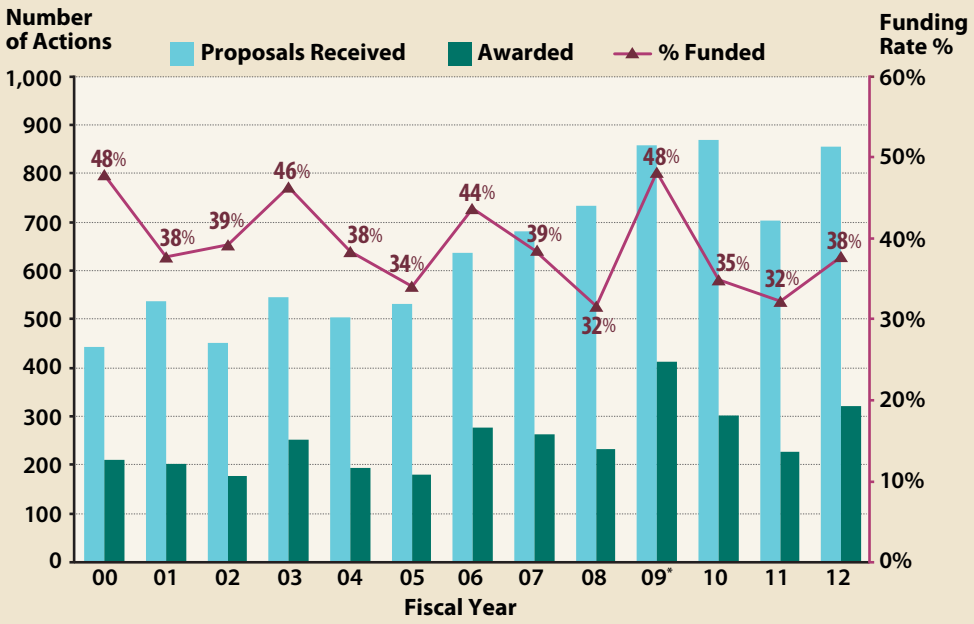
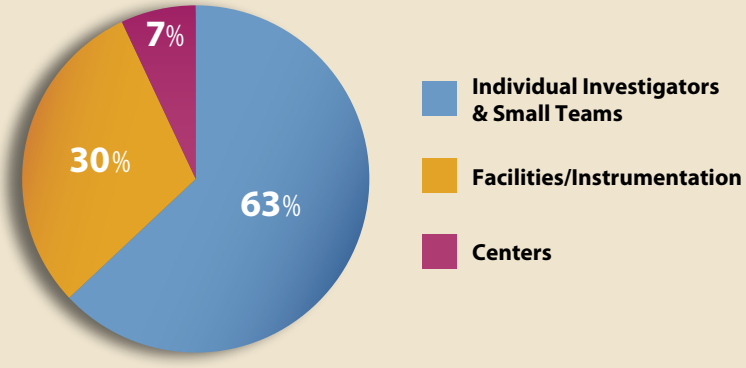


** FY 2009 funding rate includes awards made with ARRA funds.*

Note: The funding reflects the average for PHY and may not represent funding rates in individual programs

MODES OF SUPPORT FY 2012



Directorate For Mathematical & Physical Sciences

PHONE: **(703) 292-8800** | FAX: **(703) 292-9151** | ROOM: **1005N** | **www.nsf.gov/MPS**

Proposal Review: MPS maximizes the quality of the proposals it supports through the use of a competitive, merit-based review process. In FY 2012, 94.5% of research funds were allocated to externally reviewed projects.

Committee of Visitors (COV): MPS convenes Committees of Visitors, composed of qualified external evaluators, to review each program periodically. These experts assess the integrity and efficiency of the processes for proposal review. COV reports and relevant Directorate responses are available at www.nsf.gov/od/oia/activities/cov/covs.jsp.

MPS Advisory Committee (MPSAC): The Mathematical and Physical Sciences Advisory Committee advises MPS on issues such as: the mission, programs, and goals that can best serve the scientific community; promoting quality graduate and undergraduate education in the mathematical and physical sciences; and priority investment areas in MPS-supported research. Minutes from MPSAC meetings are available at www.nsf.gov/mps/advisory.jsp

OFFICE OF MULTIDISCIPLINARY ACTIVITIES (OMA)

OMA seeds crosscutting research in areas of strategic emphasis for MPS as well as areas that might develop into strategic importance; facilitates, partnerships with other agencies, national laboratories, industries, state and local governments, and international organizations; and supports innovative experiments in education and broadening participation. The purpose of OMA investments is to initiate, but not sustain indefinitely, these activities.

OMA does not accept external proposals. Rather it encourages submission from MPS Divisions of initiatives and projects that are multi-investigator, multi-disciplinary, and strategic to MPS, as well as innovative projects incorporating education and broadening participation that contribute to a diverse, technical workforce.

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Carnegie Institute of Washington

Dr. Eric Cornell
NIST/University of Colorado

Dr. Naomi Halas
Rice University

Dr. Dennis Matthews
University of California, Davis

Dr. Michael Norman
University of California, San Diego

Dr. Eugenia Paulus
North Hennepin Community College

Dr. Esther Takeuchi
University of New York, Buffalo

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Carnegie Mellon University

Dr. Elizabeth Lada
University of Florida

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Dr. Geoffrey West
Santa Fe Institute

Term Expires 9/30/2015

Dr. Emily Carter
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Dr. George Crabtree
Argonne National Laboratory

Dr. Juan de Pablo
University of Chicago

Dr. Juan Meza
University of California, Merced

National Science Foundation

Directorate For Mathematical & Physical Sciences

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Division of Chemistry (CHE)

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Division of Materials Research (DMR)

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Division of Mathematical Sciences (DMS)

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