



Overview of the National Science Foundation

W. Lance Haworth
Director, Office of Integrative Activities

**Committee on Equal Opportunities
in Science and Engineering**
9 March 2010

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"Catalyzing Excellence in Research and Education"



Today's Topics

- NSF—Past and Present
- Budget Context and Trends
- Looking Ahead - Challenges and Opportunities

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Beginnings

On May 10, 1950, President Harry S. Truman signed a bill establishing the National Science Foundation. The President announced the creation of the new federal agency, dedicated to advancing the scientific enterprise of the United States, from the rear platform of a train in Pocatello, Idaho.

Alan T. Waterman, chief scientist at the Office of Naval Research, was nominated by President Truman as NSF's first director and provided with a budget of \$225,000. From that initial allocation, the National Science Board, established along with NSF and given oversight over its operations, made 97 grants, including one to physical chemist Max Delbruck, who went on to win the 1969 Nobel Prize in Medicine.

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NSF in a Nutshell

- Independent USG Agency established in 1950
- NSF Director and National Science Board
- Funds basic research and education
- Peer-review grant mechanism
- Bottom-up, proposal driven
- Discipline-based structure
- Cross-disciplinary mechanisms
- Use of Rotators/IPAs
- Automated grant management processes

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NSF Overview

NSF MISSION

- To promote the progress of science; advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes.

NSF VISION

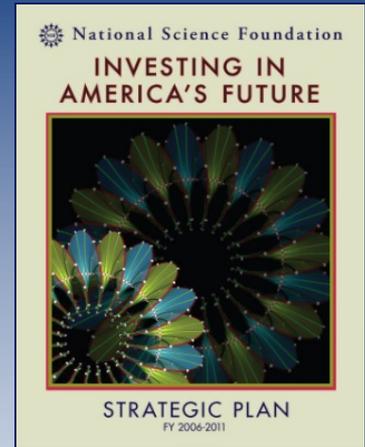
- Advancing discovery, innovation and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering workforce

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NSF Overview



NSF STRATEGIC GOALS:

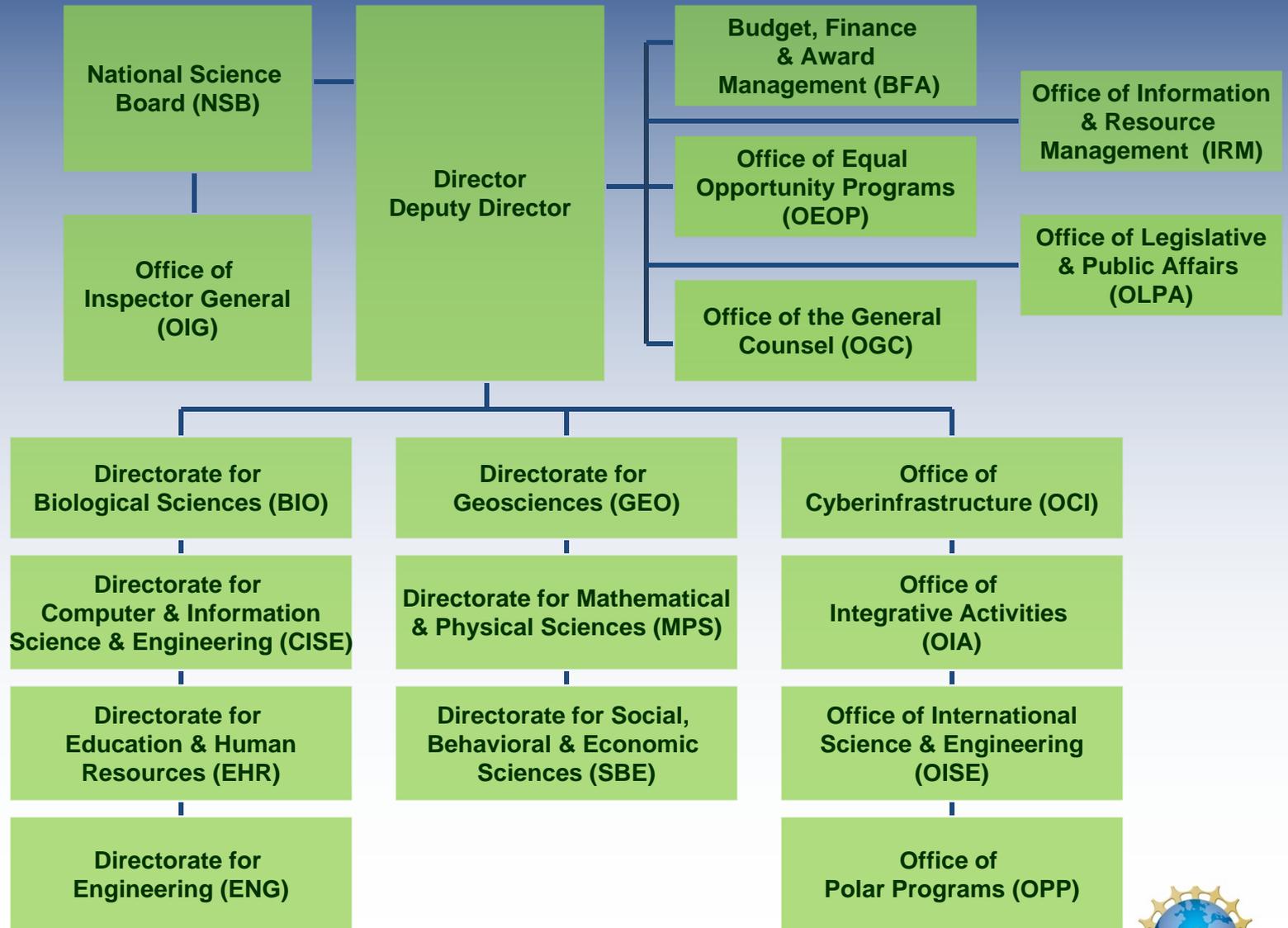
- **Discovery** – Advancing frontiers of knowledge
- **Learning** – S&E workforce and scientific literacy
- **Research Infrastructure** – Advanced instrumentation and facilities
- **Stewardship** – Supporting excellence in S&E research and education

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NSF Organization



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OIA Programs and Activities

Committee on Equal Opportunity in Science and Engineering (CEOSE)

Experimental Program to Stimulate Competitive Research (EPSCoR)

Science and Technology Centers (STCs)

Major Research Instrumentation (MRI)

Academic Research Infrastructure (ARI)

Cyber-Enabled Discovery and Innovation (CDI)

Medals and Awards

Developing STEM Talent

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National Science Board + Director = NSF



The NSF Act of 1950 created the National Science Foundation defining the agency jointly as the Board and the NSF Director:

“The Foundation shall consist of a National Science Board...and a director.” (Public Law 81-507; May 10, 1950)

NSF has an unusual dual Agency Head structure. The NSF Director was always an ex-officio member of the Board. In 1962, the NSF Director was given full voting rights and made Chairman of the Executive Committee.

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National Science Board Basics



- The Board Consists of 25 Presidentially-Appointed and Senate-Confirmed Members:
 - Shall be eminent in their fields
 - Have established records of distinguished service
 - Represent the views of scientific and engineering leaders across the nation
- 6-year Terms on 2-year Cycle (next ends May 2010)
- May serve two consecutive full terms
- NSB Chairman and Vice Chairman Elected by Members for 2-year Term
- Appointed as Board Consultants prior to confirmation and after term has expired

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NSB: Main Statutory Responsibilities

1) Policy making body for the National Science Foundation

- **The Board establishes NSF policies**
- Identifies issues that are critical to NSF's mission
- The Board may decide to delegate policymaking functions to the Director – and no one else. The NSF Director may not re-delegate those policymaking functions to anyone.

2) Serves as a body of advisors to both the President and to Congress on broad, national policy issues related to science and engineering research and education (**not simply the NSF Board but rather the National Science Board**)

3) Only the Board has the authority to approve awards – authority can be delegated to the Director

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Board Reports Focused on NSF



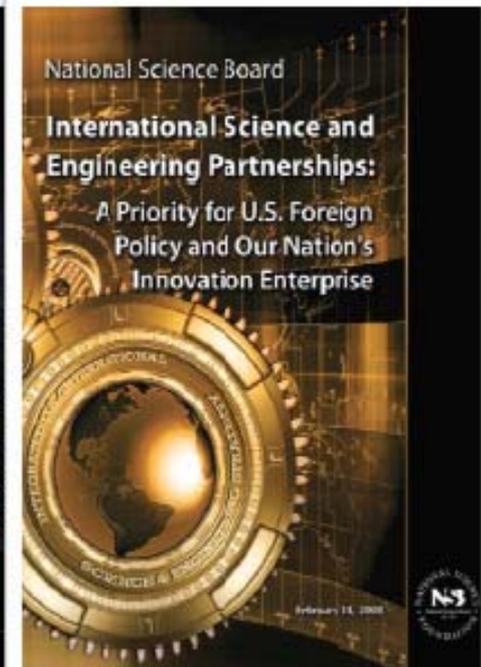
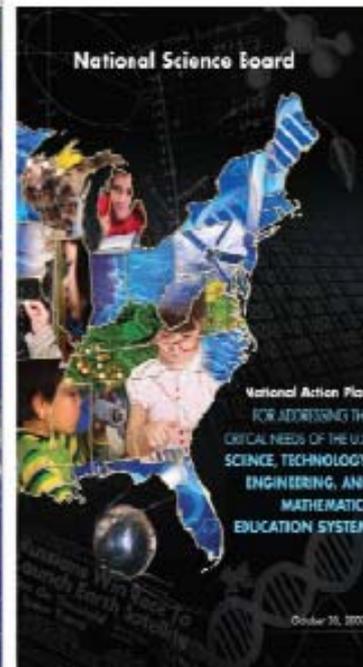
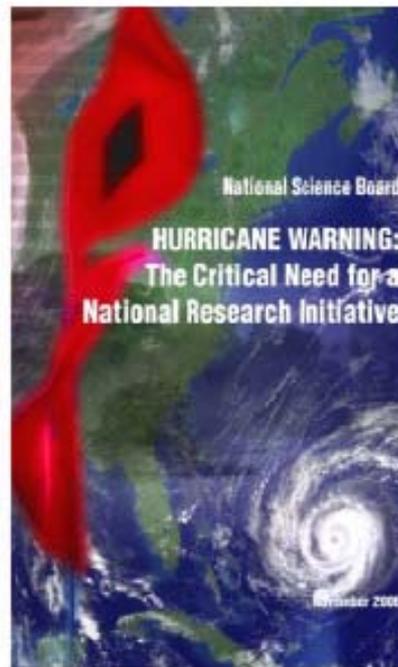
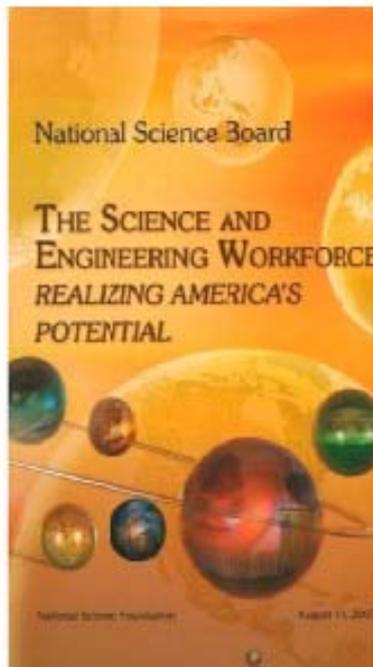
www.nsf.gov/nsb

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Board Reports of Broad Interest



www.nsf.gov/nsb

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NSF Merit Review Criteria

INTELLECTUAL MERIT:

- Potential to advancing knowledge and understanding within and across fields
- Investigators' qualifications
- Creativity, originality, potentially transformative
- Conceptualization and organization
- Access to resources

BROADER IMPACTS:

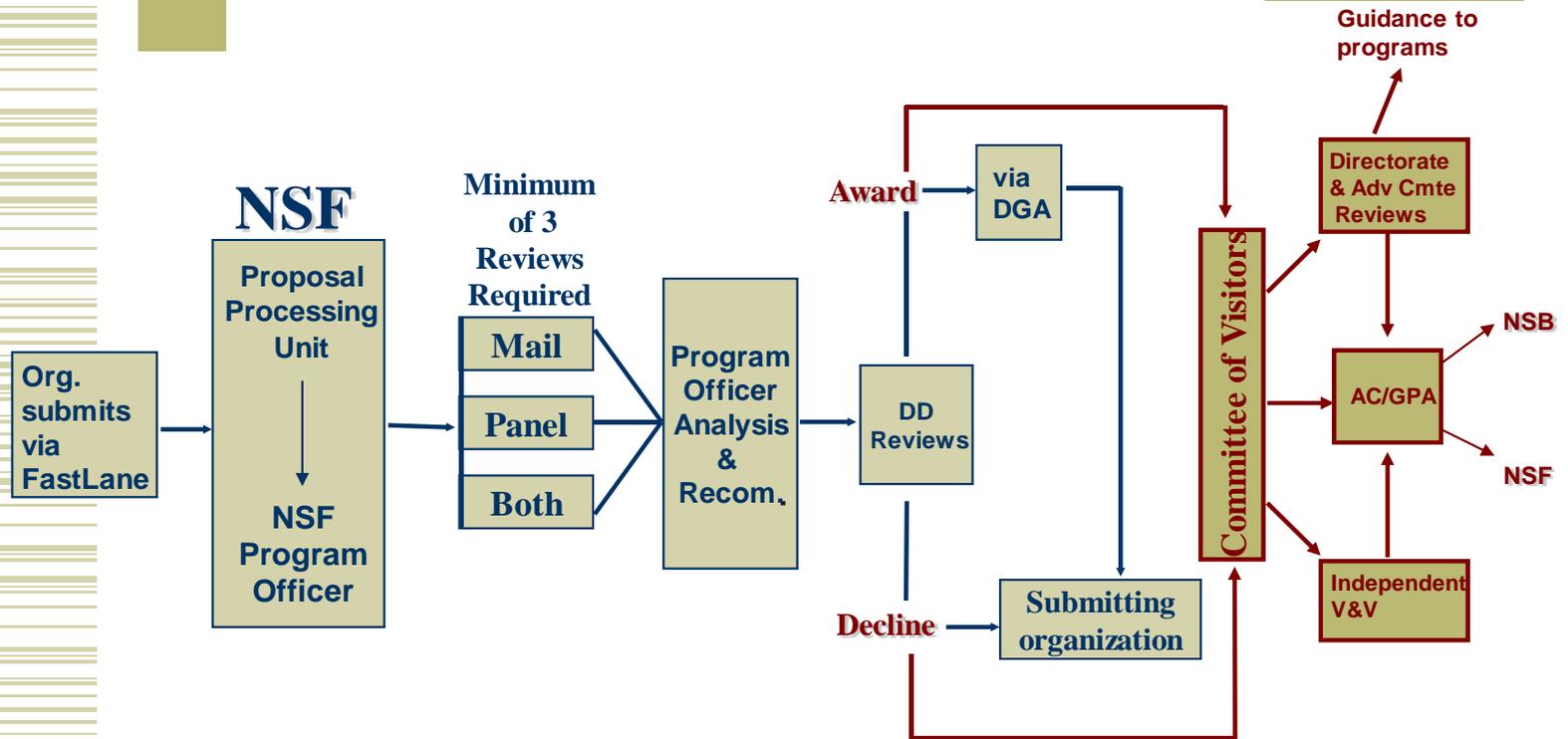
- Fostering discovery and understanding while promoting teaching, training and learning
- Participation of underrepresented groups
- Enhancement of infrastructure for research and education
- Dissemination of results to enhance S&T understanding
- Benefits to society

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NSF Merit Review Process



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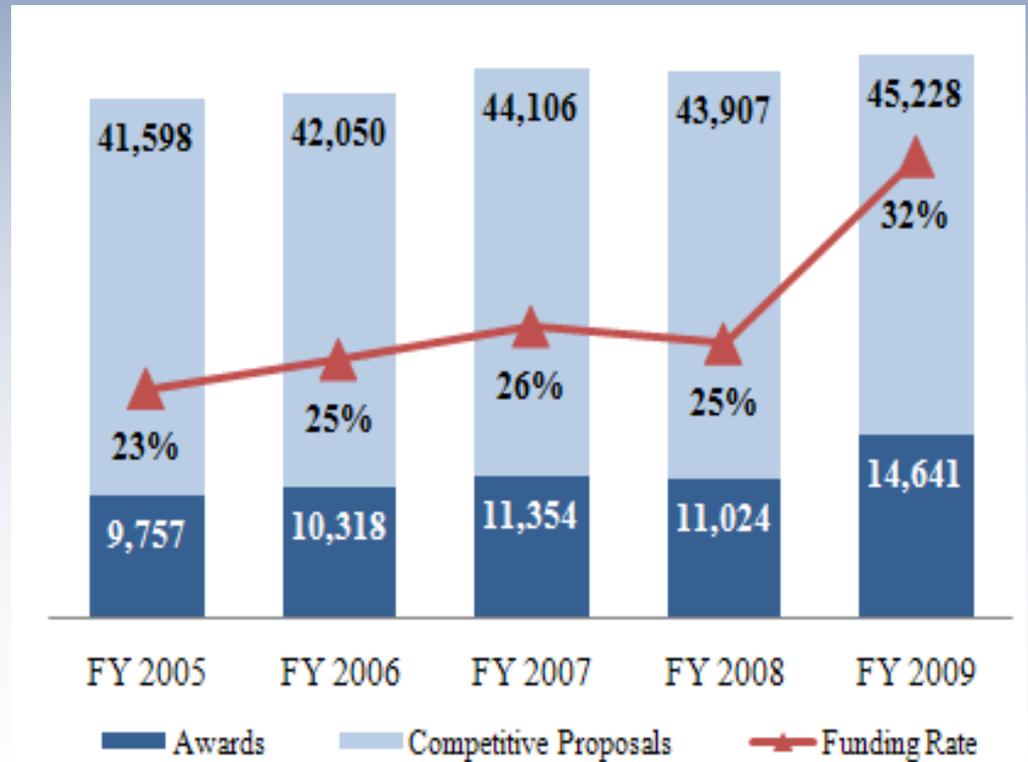
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Proposals, Awards and Funding Rates

Awards by Institution

- Academic Institutions: **77%**
- Non-profits: **13%**
- For-profit firms: **6%**
- Fed agencies/labs: **4%**

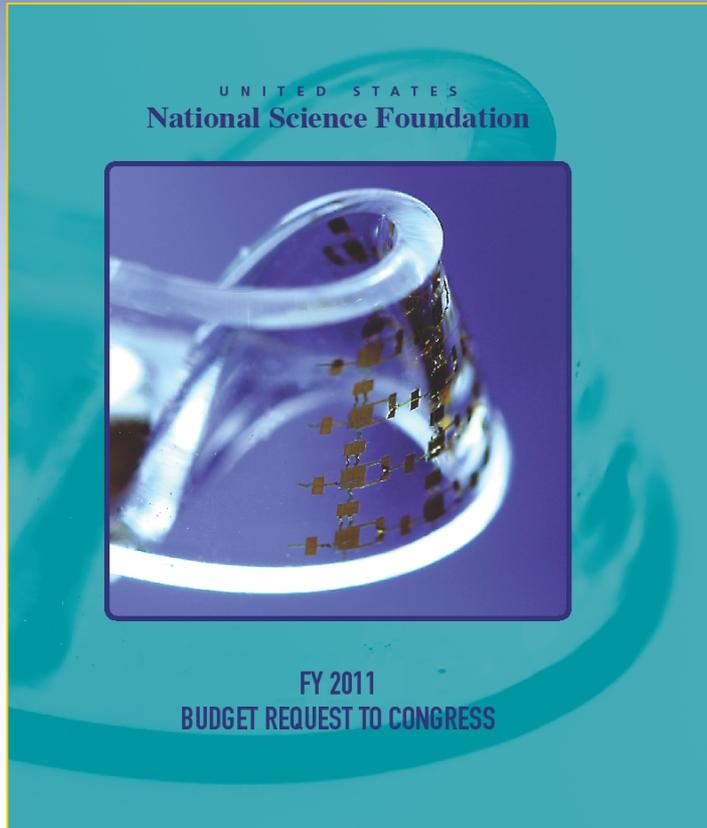


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NSF Budget



FY 2011 *Request*

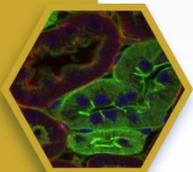
TOTAL: \$7.4 billion
Increase: 8 percent

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<h1 style="text-align: center;">NSF Funding by Account</h1> <p style="text-align: center;">(Dollars in Millions)</p>		
	2011 Request	2010 Estimate
Research and Related Activities	\$6,018.83	\$5,563.92
Education and Human Resources	892.00	872.76
MREFC	165.19	117.29
Agency Operations and Award Management	329.19	300.00
National Science Board	4.84	4.54
Office of Inspector General	14.35	14.00
Total NSF	\$7,424.40	\$6,872.51



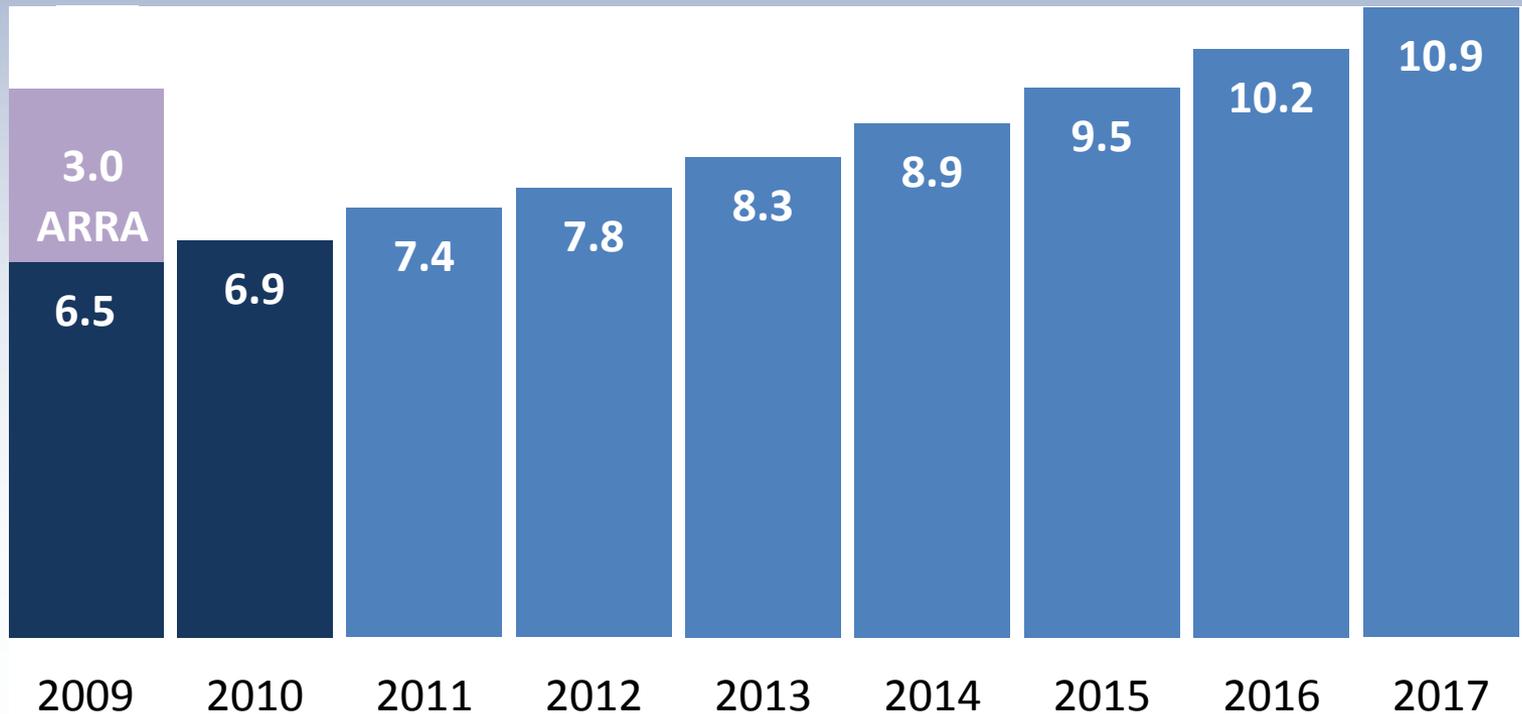
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NSF Budget

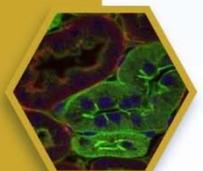
Total NSF Funding
(dollars in billions)



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Some thematic and programmatic highlights

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Administration Priority Programs Supported in the NSF FY 2011 Budget

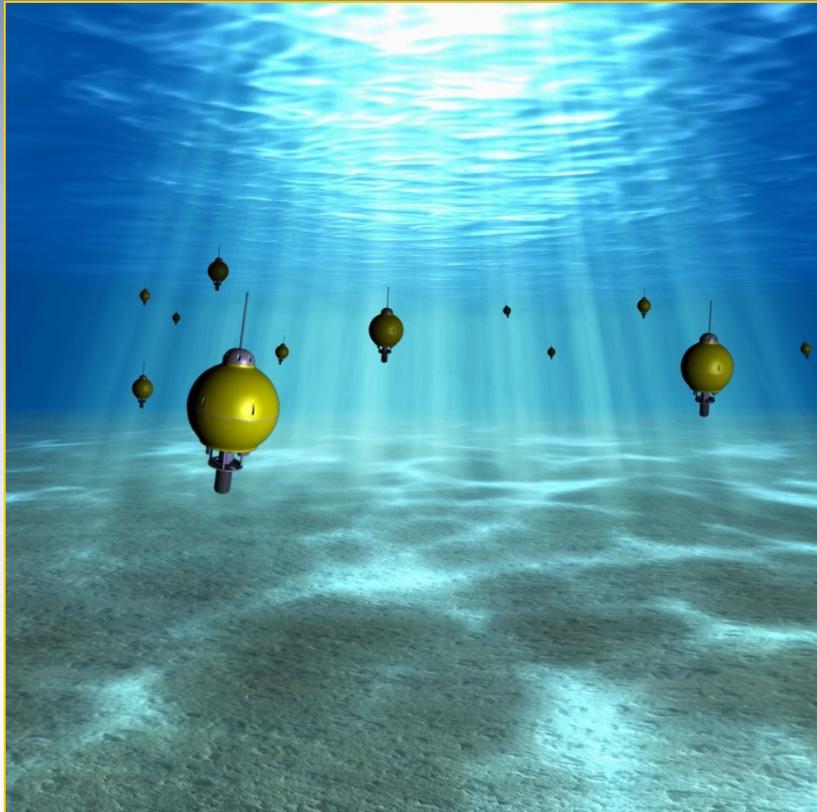
- Graduate Research Fellowships: **\$158 million**
- Faculty Early Career Development: **\$209 million**
- Climate Change Education Program: **\$10 million**
- Advanced Technological Education: **\$64 million**
- Networking and Information Technology R&D Program: **\$1.17 billion**
- U.S. Global Change Research: **\$370 million**
- National Nanotechnology Initiative: **\$401 million**

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Cyber-Enabled Discovery and Innovation (CDI)

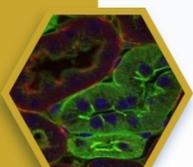


CDI will support a wide variety of research, including the work needed to design and develop control systems for Autonomous Underwater Explorers.

**FY 2011 Request:
\$105 million**

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NSF Centers Foster Innovation

NSF supports more than 100 centers in seven interdisciplinary program areas that facilitate innovation



Center for Behavioral Neuroscience



Center for Biophotonics

FY 2011 Request: \$314 million

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A Compelling Vision

“There is no more fertile ground for innovation than a diversity of experience. And that diversity of experience arises from a difference of cultures, ethnicities, and life backgrounds. A successful scientific endeavor is one that attracts a diversity of experience, draws upon the breadth and depth of that experience, and cultivates those differences, acknowledging the creativity they spark.”

Prof. Joseph DeSimone, Director
NSF STC for Environmentally Responsible Solvents and Processes

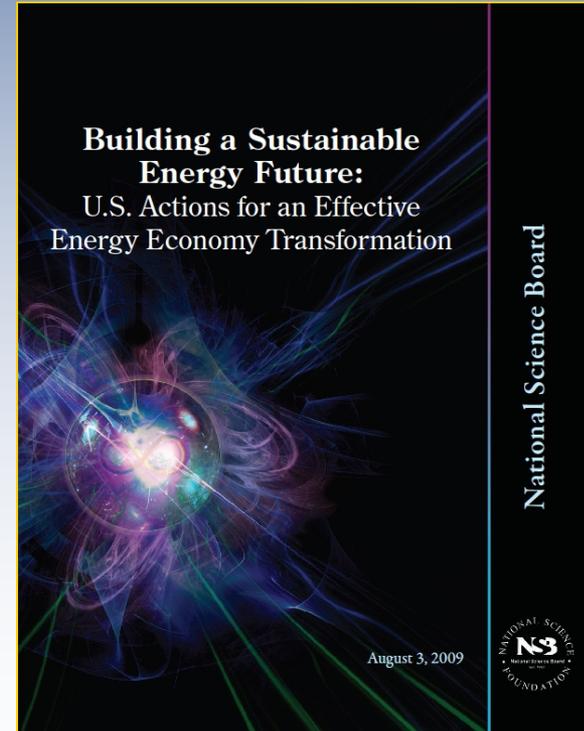
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Science, Engineering, and Education for Sustainability (SEES)

SEES is a portfolio of programs that will integrate NSF's existing efforts in climate science and engineering research with new education and cyber-based activities.



FY 2011 Request:
\$766 million

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RE-gaining our ENERGY Science and Engineering Edge (RE-ENERGYSE)

RE-ENERGYSE is a joint program with the Department of Energy to educate young people for careers in clean-energy research.



FY 2011 Request: \$19 million

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Experimental Program to Stimulate Competitive Research (EPSCoR)

EPSCoR is a joint program of NSF and 29 U.S. states and territories that promote the development of science and technology resources.



FY 2011 Request: \$154 million

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EPSCoR

FY 2011 Request: \$154,360,000
% Change from FY 2010: +4.9%

- **Purpose/Objectives:**
 - Build research capacity and competitiveness
 - Broaden individual and institutional participation in STEM
 - Promote development of a technically engaged workforce
 - Foster collaborative partnerships
- **Programmatic Activities:**
 - Research Infrastructure Improvement
 - Outreach and Workshops
 - Co-Funding

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NSF EPSCoR Jurisdictions

1980

Arkansas
Maine
Montana
South Carolina
West Virginia

2001

Hawaii
New Mexico

2002

U.S. Virgin Islands

1985

Alabama
Kentucky
Nevada
North Dakota
Oklahoma
Puerto Rico
Vermont
Wyoming

2003

Delaware

2004

New Hampshire
Rhode Island
Tennessee

2009

Iowa
Utah

1987

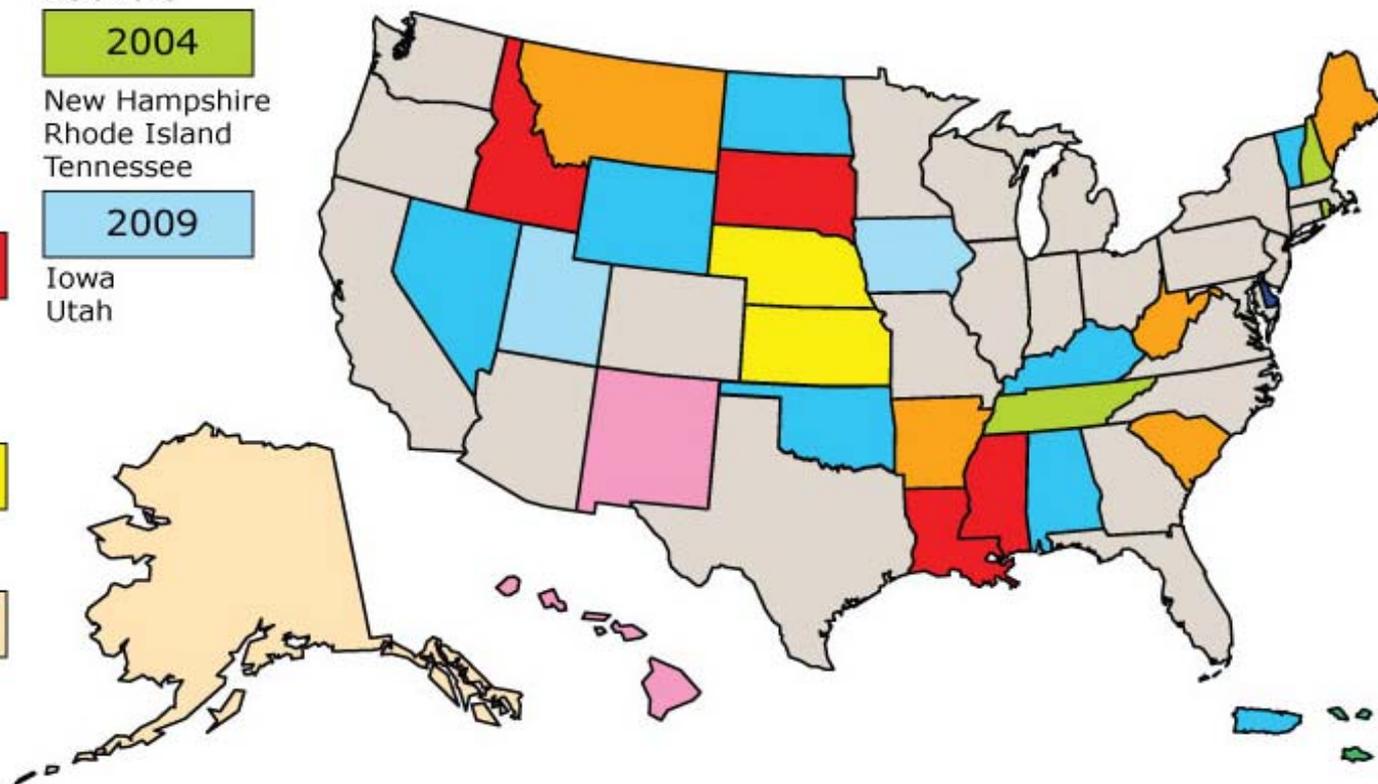
Idaho
Louisiana
Mississippi
South Dakota

1992

Kansas
Nebraska

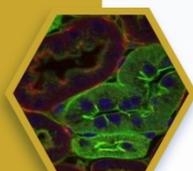
2000

Alaska



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Broadening Participation

A \$103 million program, **Comprehensive Broadening Participation of Undergraduates in STEM**, will expand effective approaches in Historically Black Colleges and Universities, Hispanic-serving institutions, Tribal Colleges and Universities, and Louis Stokes Alliances for Minority Participation institutions.



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Office of the Director (OD)



NSF Broadening Participation

[Broadening Participation Home](#)[Broadening Participation Portfolio](#)[Broadening Participation Outreach](#)[Broadening Participation Working Group](#)["Framework for Action" Report](#)[Links of Interest](#)[Office of the Director](#)

Broadening Participation

Background

NSF's commitment to broadening participation is embedded in its Strategic Plan through a variety of investment priorities related to the Learning and Stewardship strategic outcome goals, including:

- Preparing a diverse, globally engaged science, technology, engineering, and mathematics (STEM) workforce;
- Integrating research with education, and building capacity;
- Expanding efforts to broaden participation from underrepresented groups and diverse institutions across all geographical regions in all NSF activities; and
- Improving processes to recruit and select highly qualified reviewers and panelists.

Guided by the Strategic Plan, NSF established a performance area focused on broadening participation: **to expand efforts to increase participation from underrepresented groups and diverse institutions throughout the United States in all NSF activities and programs.**

The report "[A Framework for Action](#)" outlines this approach.

Inquiries

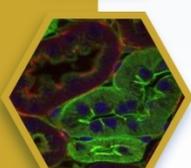
Fae Korsmo fkorsmo@nsf.gov

Funding PIs

		2002	2003	2004	2005	2006	2007	2008	2009
American Indian / Alaska Native	Proposals	100	112	93	94	93	80	82	77
	Total Awards	30	28	23	24	30	28	21	27
	Funding Rate	30%	25%	25%	26%	32%	35%	26%	35%
Black / African-American	Proposals	748	822	900	813	881	992	965	1,005
	Total Awards	207	192	208	193	197	234	239	291
	Funding Rate	28%	23%	23%	24%	22%	24%	25%	29%
Hispanic or Latino	Proposals	1,041	1,191	1,432	1,436	1,483	1,591	1,590	1,726
	Total Awards	300	342	347	322	374	418	381	530
	Funding Rate	29%	29%	24%	22%	25%	26%	24%	31%
Native Hawaiian / Pacific Islander	Proposals	32	37	47	21	25	24	30	21
	Total Awards	7	12	4	4	7	4	7	8
	Funding Rate	22%	32%	9%	19%	28%	17%	23%	38%
Asian	Proposals	5,509	6,895	7,618	7,253	7,821	8,622	8,847	9,396
	Total Awards	1,195	1,445	1,382	1,278	1,507	1,776	1,762	2,433
	Funding Rate	22%	21%	18%	18%	19%	21%	20%	26%
White, Not of Hispanic Origin	Proposals	25,288	28,081	30,251	28,752	28,645	29,318	28,842	28,525
	Total Awards	7,985	8,130	7,713	7,305	7,568	8,103	7,815	10,031
	Funding Rate	32%	29%	25%	25%	26%	28%	27%	35%

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Sampling of Broadening Participation Programs Across NSF

- Research Initiation Grants to Broaden Participation in Biology (BIO)
- Broadening Participation in Computing (CISE)
- Research in Disabilities Education (EHR)
- Research on Gender in Science and Engineering (EHR)
- Broadening Participation Research Initiation Grants in Engineering (ENG)
- Opportunities for Enhancing Diversity in the Geosciences (GEO)
- Partnerships for Research and Education in Materials (MPS)
- Partnerships in Astronomy & Astrophysics Research and Education (MPS)
- Minority Postdoctoral Research Fellowships and Follow-up Research Starter Grants (SBE)
- Cyberinfrastructure Training, Education, Advancement, and Mentoring for Our 21st Century Workforce (NSF-wide)
- ADVANCE (NSF-wide)

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For Further Information

Office of Integrative Activities (OIA)

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www.nsf.gov/od/oia/

Experimental Program to Stimulate
Competitive Research (EPSCoR)

Phone: (703) 292-8683

Fax: (703) 292-9047

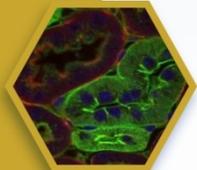
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Thank You!

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