

National Science Foundation

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Office of Integrative Activities

(with special focus on the MRI and STC programs)

Nashville, Tennessee

Regional Grants Conference

March 2011

JENNIFER M. SCHOPF

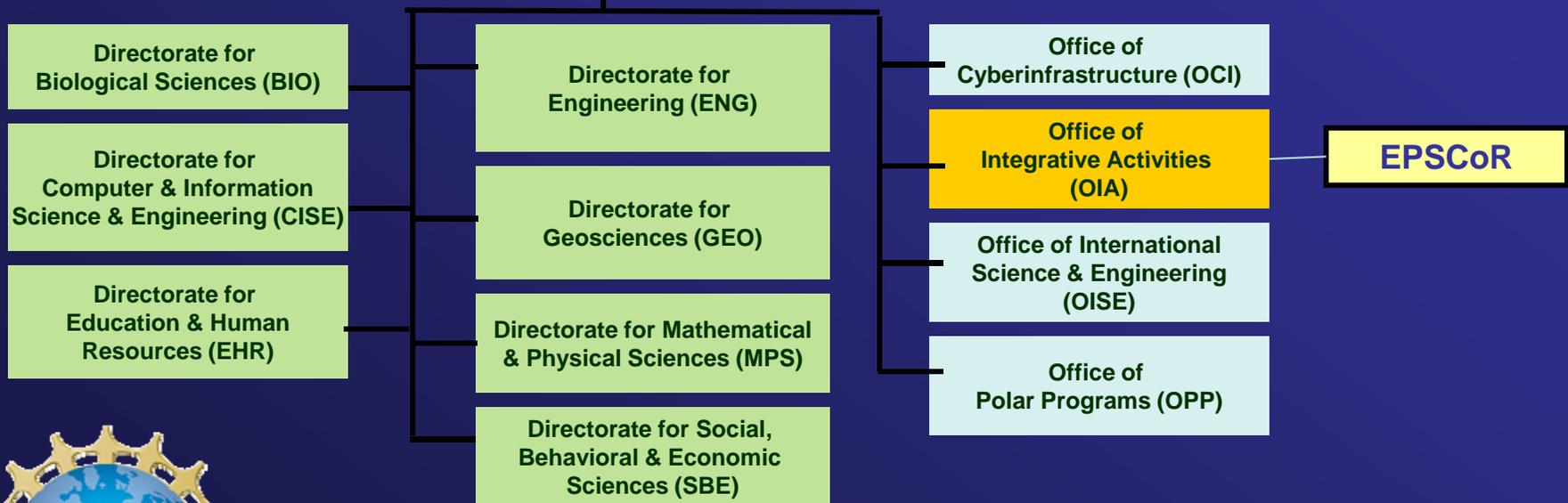
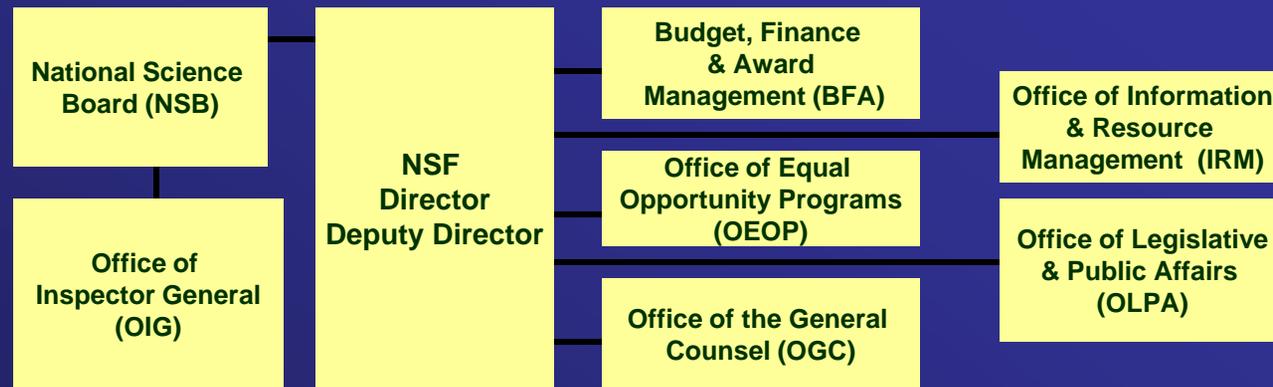
[jschopf@nsf.gov](mailto:jschopf@nsf.gov)

<http://www.nsf.gov/od/oia/>



OFFICE OF INTEGRATIVE ACTIVITIES

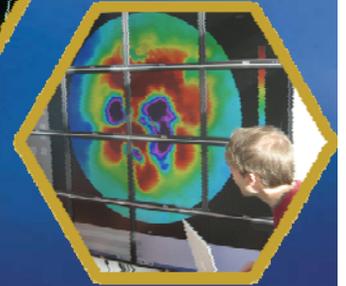
# OIA at NSF



Directorates/Divisions → Colleges/Departments

# Office of Integrative Activities

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- **Organizationally**
  - Located in Office of the NSF Director
  - An Office (EPSCoR) within an Office
- **Catalyzing Excellence in Research and Education**
- **Programmatic** and **Policy** responsibilities that cut across NSF

# OIA Programs and Activities

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- **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**
- **Committee on Equal Opportunity in Science and Engineering (CEOSE)**

*“Catalyzing Excellence in Research and Education”*



# OIA PROGRAMS



OFFICE OF INTEGRATIVE ACTIVITIES

# *Science and Technology Centers (STC) Program<sup>1</sup>*

<sup>1</sup> The STC program is coordinated by the Office of Integrative Activities (OIA) in collaboration with Directorates and Offices across NSF.



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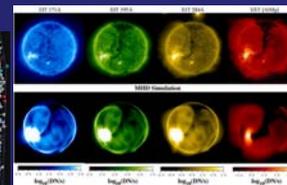
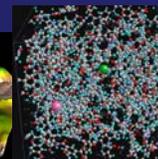
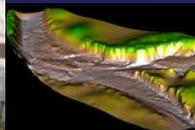
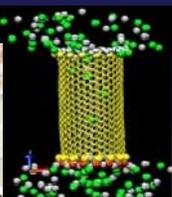


# Science and Technology Centers: Integrative Partnerships

Innovative, potentially transformative, complex research and education projects that require large-scale, long-term awards

A means to undertake **important investigations at the interfaces of disciplines and/or fresh approaches within disciplines**

NSF expects STCs to demonstrate leadership in the involvement of groups traditionally underrepresented in science and engineering at all levels within the Center





“Create a shared intellectual space,  
integral to the center’s activities, providing  
a collaborative research environment that  
crosses disciplinary and institutional  
boundaries”



*Wojciech Szpankowski, Purdue University  
Director, Center for Science and Information (an NSF STC)*

# New solicitation in FY 2011

ng | [OIA Awards](#) | [OIA Discoveries](#) | [OIA News](#) | [About OIA](#)

Email  Print  Share 

## Science and Technology Centers: Integrative Partnerships

STC ANNOUNCEMENTS

STC Brochure now available. Please click this [link](#) to view.

Five new Science and Technology Centers (STC) were awarded in summer 2010 as a result of a recent, merit-based competition. The press release with descriptions of the new centers can be found by clicking [here](#).

A new STC competition is underway. Please review the solicitation below for more information.

AAAS Report: National Science Foundation Centers Support Transformative Research, Provide Compelling S&T Education. Click [link](#) to view.

CONTACTS

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<a href="#">Dragana Brzakovic</a>	<a href="mailto:dbrzakov@nsf.gov">dbrzakov@nsf.gov</a>	(703) 292-8040	

PROGRAM GUIDELINES

Solicitation [11-522](#)

- Current solicitation number: 11-522
- Preproposal Deadline: May 30, 2011
- Limit: 3 per institution
- Full Proposal Deadline (invitation only): February 3, 2012
- All areas of NSF
- Each STC is an extended partnership led by one institution



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# Science and Technology Centers: 10

## Science and Technology Centers: Integrative Partnerships

PROGRAM SOLICITATION  
NSF 11-522

REPLACES DOCUMENT(S):  
NSF 08-580



National Science Foundation  
Office of Integrative Activities  
Directorate for Biological Sciences  
Directorate for Computer & Information Science & Engineering  
Directorate for Education & Human Resources  
Directorate for Engineering  
Directorate for Geosciences  
Directorate for Mathematical & Physical Sciences  
Directorate for Social, Behavioral & Economic Sciences  
Office of Cyberinfrastructure  
Office of International Science and Engineering  
Office of Polar Programs

Preliminary Proposal Due Date(s) (required) (due by 5 p.m. proposer's local time):

May 30, 2011

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

February 03, 2012

### IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the NSF Proposal & Award Policies & Procedures Guide (PAPPG), NSF 11-1, was issued on October 1, 2010 and is effective for proposals submitted, or due, on or after January 18, 2011. Please be advised that the guidelines contained in NSF 11-1 apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 18, 2011, must also follow the guidelines contained in NSF 11-1.

- Estimated Preproposals: 150-200
- Estimated Number of Awards: 6
- Estimated Funding: \$30M

### • Contacts:

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[dbrzakov@nsf.gov](mailto:dbrzakov@nsf.gov)



# OFFICE OF INTEGRATIVE ACTIVITIES

# What's Expected of STC's

- World-class research through partnerships
- **Innovative, transformative, complex research and edu**
- Important investigations at the interfaces of disciplines and/or fresh approaches within disciplines
- **Environment for encouraging future scientists, engineers, and educators to take risks**
- Foster excellence in edu by integrating edu and research, and by creating bonds between learning and inquiry
- **Demonstrate leadership in the involvement of groups traditionally under-represented in STEM at all levels**
- Facilitate knowledge transfer - the mutual exchange of scientific and technical information among the Center partners and others

# What's Expected of STCs

**Long-term Impact!**



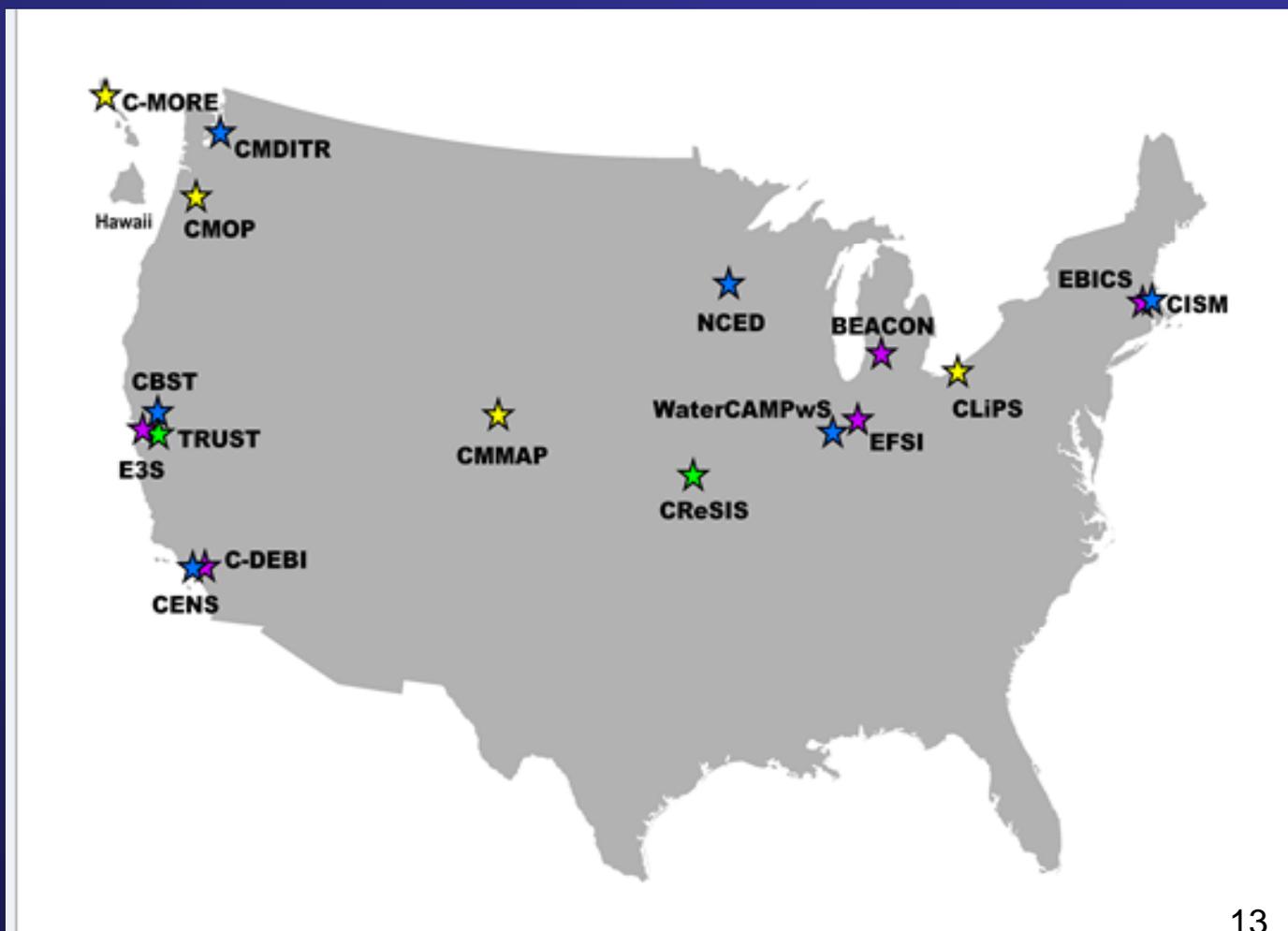
# Science and Technology Centers: Integrative Partnerships

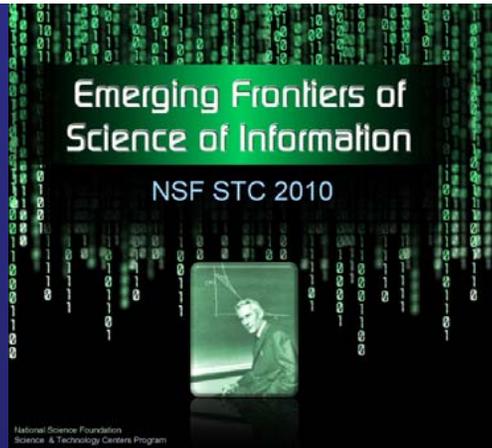
★ 2002

★ 2005

★ 2006

★ 2010





Bryn Mawr  
Howard  
MIT  
Princeton  
Purdue  
Stanford  
UC Berkeley  
UC San Diego  
UIUC

## Overview of BEACON

Center for the Study of Evolution in Action



STC Directors' Meeting  
August 30, 2010

Erik Goodman, Director  
Michigan State University

# Five new STCs established in 2010

[http://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=116378&org=NSF&from=news](http://www.nsf.gov/news/news_summ.jsp?cntn_id=116378&org=NSF&from=news)

For more information, contact: **Joan M. Frye (jmfrye@nsf.gov)**



**EMERGENT BEHAVIOR OF INTEGRATED CELLULAR SYSTEMS: AN ENGINEERING APPROACH TO THE DESIGN OF BIOLOGICAL MACHINES**

STC Directors' Meeting  
August, 2010

Center for Dark Energy Biosphere Investigations (C-DEBI)



NSF Directors meeting  
Aug. 31 - Sept. 1 2010



*Katrina J. Edwards*  
University of Southern California  
Department of Biological Sciences



Mission Statement:

To develop the device science and technology that will reduce energy consumption in electronic systems by orders of magnitude. To inspire and train a diverse generation of scientists, engineers, and technicians.

NSF, Arlington VA  
Aug. 30, 2010

Eli Yablonovitch, Berkeley EECS Dept.

## NSF Center for EES

Center for Energy Efficient Electronics Science



# STCs—Some Notable Achievements

## Key contribution to Lasik surgery

*Center for Ultrafast Optical Science, University of Michigan*

## Modeling for tornado prediction used by the Weather Channel

*Center for Analysis and Prediction of Storms, University of Oklahoma*

## Genomic sequencers

*Center for Molecular Biotechnology, University of Washington*

South pole telescope -*Center for Astrophysical Research in Antarctica, University of Chicago*

## New generation of computer animation, including PIXVAR

*Center for Computer Graphics and Visualization, University of Utah (originally Cornell)*



## Additional Information on Science and Technology Centers

### NSF Office of Integrative Activities

<http://nsf.gov/dir/index.jsp?org=OIA>

### Profiles in Team Science

[http://depts.washington.edu/teams  
ci/welcome.html](http://depts.washington.edu/teams<br/>ci/welcome.html)



### AAAS Blue Ribbon Panel Report on STC Program Outcomes

<http://www.aaas.org/news/releases/2011/0301stc.shtml>

# *The Major Research Instrumentation (MRI) Program<sup>1</sup>*

<http://www.nsf.gov/od/oia/programs/mri/>

<sup>1</sup>The MRI program is coordinated by the Office of Integrative Activities (OIA) in collaboration with Directorates and Offices across NSF.



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# Major Research Instrumentation (MRI) <sup>18</sup>

## *Strategic Goals That Proposals Should Address*

- Supporting the **acquisition** of major state-of-the-art instrumentation, thereby improving access to, and increased use of, modern instrumentation shared by the Nation's scientists, engineers, and graduate and undergraduate students;

**OR**

- Fostering the **development** of the next generation of major instrumentation, resulting in new instruments that are more widely used, and/or open up new areas of research and research training;

---

**AND**

- Enabling academic departments, disciplinary and cross-disciplinary units, and multi-organization collaborations to create well-equipped research environments that **integrate research with education**;

# Major Research Instrumentation (MRI) <sup>19</sup>

## *Acquisition versus Development<sup>1</sup>*

### ● Acquisition:

- ❖ Little/no modification from existing vendors/sources
- ❖ May involve assembly of readily available components
- ❖ Rapid implementation
- ❖ Limited personnel, limited risk

### ● Development:

- ❖ Capabilities not otherwise available – accuracy, reliability, resolving power, throughput, sample capacity, flexibility...
- ❖ Design, construction, testing → longer timescales, higher risk (mitigation)
- ❖ Often require more personnel
- ❖ Does not include standard upgrades, simple assembly, porting of application software, development of technologies, products or techniques



<sup>1</sup>See solicitation and FAQs for further guidance

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# MRI: *Additional Goals*

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- Support acquisition and development of research instrumentation that uses, advances, and/or expands the nation's cyber-infrastructure and/or high performance capability:
  - Support development of computational and data-intensive science and engineering programs, or
  - Provide pathways to regional and national infrastructure.
- Promote substantive and meaningful partnerships for instrument development between academic and private sectors:
  - Create innovative ideas or products with wide scientific or commercial impact.



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# MRI – The Basics

- **Restrictions on organization submission eligibility**
  - Additional info follows
- **Submission limit<sup>1</sup>**- Three (3) per organization: *If three proposals are submitted, at least one of the proposals must be for instrument development.*
- **Request size from NSF** - \$100,000-\$4 million from all eligible organizations; < \$100,000 exception for certain disciplines and from non-Ph.D.-granting institutions.



<sup>1</sup>Proposals that violate this limit are subject to return without review

# MRI – The Basics

- **Cost-sharing** at the level of 30% of the *total project cost* is required for Ph.D.-granting institutions and non-degree-granting organizations. *Cost-sharing is not required for non-Ph.D. granting institutions.*
- **Merit Review** - At the time of submission, PI's are asked to identify an NSF division(s) to review proposal. NSF reserves the right to place proposals in the appropriate division(s) for review.



<sup>1</sup>Proposals that violate this limit are subject to return without review

# MRI: Organizations Eligible to Submit Proposals

- 1. Institutions of higher education** acting on behalf of their faculty members, that are accredited in and have a campus in the United States, its territories or possessions.
- 2. Not-for-profit, non-degree granting domestic U.S. organizations** that include (but are not limited to) independent museums and science centers, observatories, research laboratories, professional societies, and similar organizations that are directly associated with the Nation's research or educational activities. These organizations must have an independent, permanent administrative organization (e.g. an office of sponsored research) located in the United States, its territories or possessions, and have 501 (c)(3) tax status.
- 3. Legally incorporated, not-for-profit consortia** including two or more submission eligible organizations as described in items (1) and (2) above. Such a consortium is one with an independent administrative structure (e.g. an office of sponsored research) located in the United States, its territories or possessions and 501 (c)(3) tax status.



<http://www.nsf.gov/od/oia/programs/mri/>

# MRI: Classification of Organizations

- **Ph.D. granting institutions of higher education** are accredited colleges and universities that have awarded more than 20 Ph.D.s or D.Sci.s in all NSF-supported fields during the combined previous two academic years. Additionally, any organization that awards Ph.D. or D.Sci. in NSF-supported fields is considered to be a Ph.D.-granting institution if the only degrees it awards in NSF-supported fields are post-Bachelor's degrees.
- **Non-Ph.D. granting institutions of higher education** are accredited colleges and universities (including two-year community colleges) that award Associate's degrees, Bachelor's degrees, and/or Master's degrees in NSF-supported fields, but have awarded 20 or fewer Ph.D./D.Sci. degrees in all NSF-supported fields during the combined previous two academic years.
- **Non-degree granting organizations** are those that do not award Associate's degrees, Bachelor's degrees, Master's degrees, and/or Ph.D.s or D.Sci.s. Non-degree-granting organizations also include institutions of higher education that award all of their degrees outside of NSF-supported fields.

# MRI Highlights

## *Highlights from MRI FY09 & FY10*

1) \$125,180 – MPS/PHY  
Rhodes College  
Neutron Detector Array  
Development

Investigators from primarily undergraduate institutions are collaborating to explore changes of the nuclear structure in nuclei far from stability and reaction rates for astrophysical applications.

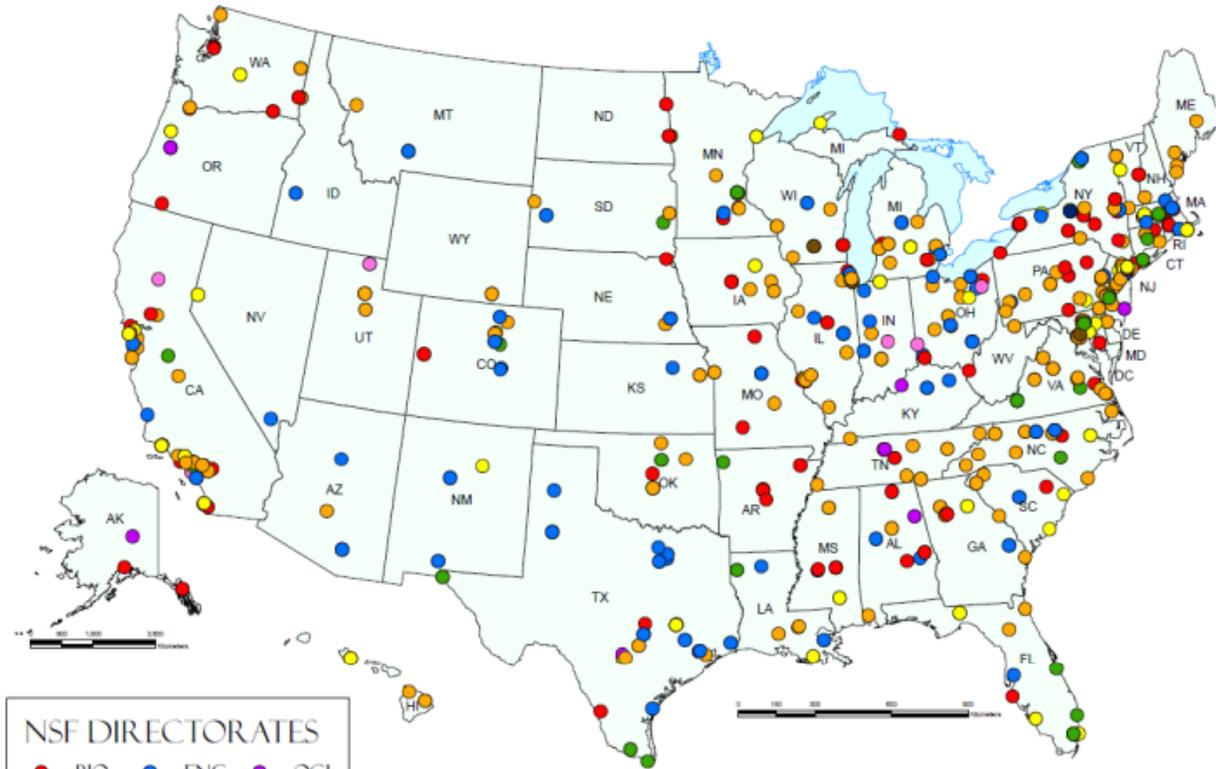


2) \$3,948,000 Award  
– BIO/DBI Vanderbilt U.  
900 MHz NMR Spectrometer

NMRs are frequent requests to MRI because they enable leading-edge scientific research spanning a wide range of disciplines. Most proposals request 400-600 MHz instruments, and request < \$1 million. The availability of ARRA funding made possible the support of this meritorious \$4 million award.



# MRI PROGRAM AWARDS FY2009 - FY2010



**NSF DIRECTORATES**

● BIO	● ENG	● OCI
● CISE	● GEO	● OPP
● EHR	● MPS	● SBE

OFFICE OF INTEGRATIVE ACTIVITIES  
 Awards made through NSF 09-502, NSF 09-561, NSF 10-529 and MRI RAPID Solicitation

**NATIONAL SCIENCE FOUNDATION**  
**MAJOR RESEARCH INSTRUMENTATION**

**MRI GOALS**

- Catalyzing new knowledge and discoveries
- Empowering the Nation's scientists and engineers
- Providing state-of-the-art research instrumentation
- Enabling research-intensive learning environments
- Building capacity for a diverse workforce
- Developing next generation instrumentation
- Promoting academic-private sector partnerships

MRI@NSF.GOV  
[www.nsf.gov/od/oiia/programs/mri](http://www.nsf.gov/od/oiia/programs/mri)



# OFFICE OF INTEGRATIVE ACTIVITIES

# 2010 MRI Award Snapshot – Overall<sup>1</sup><sup>27</sup>

**Number Reviewed:** 940 (207 DEV, 733 ACQ)

**Dollars Requested :** \$626.1 million

**Number of Awards:** 169 (42 DEV, 127 ACQ)

**MRI Amount Awarded:** \$85.1 million

**NSF Amount Awarded:** \$93.1 million

**Overall Success Rate:** 18.0%

**Mean Award:** \$551,000

**Median Award:** \$374,000

**Number of Institutions that Participated:** 512

**Number of Institutions Awarded:** 148

<sup>1</sup>Does not include \$4.1 million used to fund 28 Grants for Rapid Response Research (RAPID) related to the 2010 Gulf of Mexico oil spill.



# 2010 MRI Award Snapshot<sup>1</sup>

## By Institution Type

	Ph.D.	non-Ph.D.	Non-degree	MSI
# reviewed	498 (32% DEV)	400 (9% DEV)	42 (31% DEV)	95
Mean request	\$823 K	\$451 K	\$861 K	\$563 K
Median request	\$632 K	\$362 K	\$504 K	\$385K
# awards	92	69	8	23
NSF \$ awarded	\$66.8 M	\$22.2M	\$4.1 M	\$8.5 M
MRI \$ awarded	\$59.6 M	\$21.5 M	\$4.0 M	\$7.8 M
Success rate	18.5%	17.3%	19.0%	24.2%
Mean award	\$726 K	\$322 K	\$516K	\$368K
Median award	\$451K	\$276 K	\$474 K	\$276 K

<sup>1</sup>Does not include \$4.1 million used to fund 28 Grants for Rapid Response Research (RAPID) related to the 2010 Gulf of Mexico oil spill.



# 2010 MRI Award Snapshot<sup>1</sup> - EPSCoR<sup>29</sup>

**Number of Proposals Reviewed: 232**

**Dollars Requested : \$154.5 M**

**Number of EPSCoR-eligible Awards: 42**

**EPSCoR-eligible Success Rate: 18.1%**

**Amount Awarded to EPSCoR-eligible Awards: \$16.3 M**

**Eligible proposals co-funded by EPSCoR\*: 1**

**EPSCoR Awarded to EPSCoR-eligible Awards: \$0.2M**

**Mean award: \$389,000**

**Median award: \$302,000**

<sup>1</sup>Does not include \$4.1 million used to fund 28 Grants for Rapid Response Research (RAPID) related to the 2010 Gulf of Mexico oil spill.

\*Later than usual MRI submission deadline of April 2010 affected the EPSCoR co-funding process.



# 2001 - 2010 MRI Award Snapshot

FY	# Proposals	\$ Requested	# Awards	MRI Funding <sup>1</sup>	Total NSF Funding*
2001	741	\$305.5	311	\$74.6	\$78.7
2002	691	\$296.3	279	\$75.7	\$81.3
2003	757	\$351.2	280	\$83.2	\$91.0
2004	838	\$421.4	327	\$109.1	\$112.9
2005	784	\$473.0	256	\$88.8	\$95.6
2006	769	\$427.4	233	\$88.2	\$97.0
2007	774	\$478.3	222	\$89.7	\$96.9
2008	810	\$515.8	224	\$93.2	\$101.0
2009	2019	\$1,724.5	651	\$399.3	\$406.1
2010**	940	\$626.1	169	\$85.1	\$93.1
<b>TOTAL:</b>	<b>9123</b>	<b>\$5,619.5</b>	<b>2,952</b>	<b>\$1,186.9</b>	<b>\$1,253.6</b>



<sup>1</sup>includes only awards submitted directly to MRI program

\*includes MRI funds and contributions from Directorates and Offices

\*\*Does not include \$4.1 million used to fund 28 Grants for Rapid Response Research (RAPID) related to the 2010 Gulf of Mexico oil spill.

# MRI: *Program Will Not Support*

- Construction, renovation or modernization of rooms, buildings or research facilities (instruments must be able to decouple from their host environment);
- Large, specialized experimental facilities (constructed with significant amounts of common building material using standard building techniques);
- General purpose and supporting equipment (e.g., general purpose computers/laboratory equipment, fume hoods, cryogen storage systems);
- Sustaining infrastructure and/or building systems (e.g., electrical, plumbing, HVAC, toxic waste disposal, telecommunications);
- General purpose platforms or environments (e.g., fixed, non-fixed structures, manned vehicles);
- Instrumentation used primarily for science and engineering education courses.

# OIA ACTIVITIES

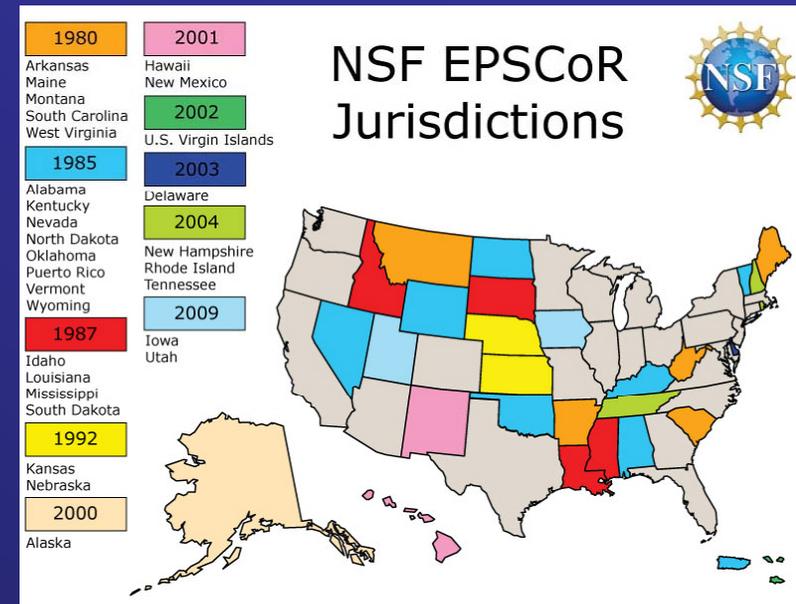


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# EPSCoR

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- Strengthening research and education in science and engineering throughout the United States and avoiding undue concentration of such research and education;
- Catalyzing key research themes and related activities within and among EPSCoR jurisdictions;
- Facilitating effective jurisdictional and regional collaborations among academic, government and private sector stakeholders;
- Broadening participation in science and engineering by institutions, organizations and people within and among EPSCoR jurisdictions.



<http://www.nsf.gov/od/oia/programs/epscor/about.jsp>

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# Activities

## National Medal of Science

- For individuals "deserving of special recognition by reason of their outstanding contributions to knowledge in the physical, biological, mathematical, or engineering sciences."

[www.nsf.gov/od/nms/medal.jsp](http://www.nsf.gov/od/nms/medal.jsp)



## Waterman Award

- Recognizing outstanding young researchers in any field of science or engineering supported by the NSF.

[www.nsf.gov/od/waterman/waterman.jsp](http://www.nsf.gov/od/waterman/waterman.jsp)

## Presidential Early Career Awards for Scientists and Engineers (PECASE)

- Providing the highest honor bestowed by the United States Government for early career scientists and engineers

[www.nsf.gov/od/oia/activities/pecase/](http://www.nsf.gov/od/oia/activities/pecase/)



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# Activities

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## American Association for the Advancement of Science (AAAS) Fellows

- Providing opportunities for learning, and input on issues relating to NSF's mission to support fundamental science and engineering research and education.



## Summer Scholars Internship Program

- Developing undergraduate and graduate student potential through exposure to science and engineering policy, issues and programs.

[www.nsf.gov/od/oia/activities/interns/about\\_ext\\_only.jsp](http://www.nsf.gov/od/oia/activities/interns/about_ext_only.jsp)

## Committee on Equal Opportunities in Science and Engineering (CEOSE)

- Encouraging full participation of women, underrepresented minorities, and persons with disabilities in scientific, engineering, and professional fields.

[www.nsf.gov/od/oia/activities/ceose/](http://www.nsf.gov/od/oia/activities/ceose/)

## Committee of Visitors (COV)

- Advising the Foundation to ensure improvement of NSF performance, and openness to the research and education community.

[www.nsf.gov/od/oia/activities/cov/](http://www.nsf.gov/od/oia/activities/cov/)



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# FUNDING RESEARCH



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# Myths about NSF

- Only funds scholars at elite graduate institutions
- Only funds “famous” academics
- Once declined, you will always be declined
- **Won't fund risky science**
- Panels make funding decisions
- You have to get “straight excellents”
- **You have to ‘fit into the box’**

# Seeking Funding from NSF

## *General Advice:*

*Understand NSF before **considering** a proposal*

- Know the Website ([www.nsf.gov](http://www.nsf.gov)) → sign up for email updates...
- Search Recent Awards ([www.nsf.gov/awardsearch](http://www.nsf.gov/awardsearch)): MRI PE 1189
- Identify possible funding opportunities ([www.nsf.gov/funding](http://www.nsf.gov/funding))
- Talk to Program Officers in Divisions/Offices “where you fit”
- Know the “Proposal and Award Policies and Procedures Guide”  
NSF 10-1/NSF 11-1: ([http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=papp](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp))
- Know program requirements
- Serve as a panelist!
- Talk to successful PIs
- Understand NSF’s role compared to other Federal agencies



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*Thank You!*



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