

National Science Foundation

Major Research Instrumentation (MRI)

The American Recovery and Reinvestment Act (ARRA)

Arlington, VA Council on Undergraduate Research CUR Dialogues

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

April 03, 2009



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**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 public-private sector partnerships

MRI@NSF.GOV
www.nsf.gov/od/oia/programs/mri

The poster features a grid of small images showing various scientific research environments, including laboratories, classrooms, and industrial settings. The background is a dark blue and green abstract design with glowing lines and a globe.

NSF Overview

Located in Arlington, VA



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NSF Overview

Strategic Plan



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

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 Overview

- **Fulfills mission chiefly by issuing limited-term (3-5 year) grants**
- **Primarily community driven – “bottom up”**
- **Currently funds about 10,000 new awards per year, out of ~42,000 submitted**
- **Fund research proposals deemed most promising by a merit-review system**
- **Merit-review by panels and mail reviews**



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NSF provides the following types of funding opportunities

- **Program Description**
Published only on the NSF website.
Proposals must follow GPG instructions.
- **Program Announcement**
Published NSF document describing the program.
Proposals must follow GPG instructions.
- **Program Solicitation**
Published document with additional restrictions and/or requirements.
Proposals must follow both the solicitation and the GPG instructions
- **Dear Colleague Letter**
Notifications of opportunities or special competitions for supplements to existing NSF awards.



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Programs

Major Research Instrumentation (MRI)

Overall Goals

- Supporting the acquisition of major state-of-the-art instrumentation, improving access to, and increased use of, modern instrumentation by scientists, engineers, and students;
- Fostering the development of the next generation of instrumentation, resulting in new instruments that are more widely used, and/or open up new areas of research and research training;
- Enabling academic departments, disciplinary and cross-disciplinary units, and multi-organization collaborations to create well-equipped research environments that integrate research with education;
- Supporting the acquisition and development of instrumentation that takes advantage of new opportunities enabled by investments in cyberinfrastructure;
- Promoting substantive and meaningful partnerships for instrument development between the academic and private sectors.



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

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Programs

Major Research Instrumentation (MRI)

Caveats

The MRI program will NOT support proposal requests for:

- General purpose equipment, including general purpose computers or assorted instruments that do not share a common or specific research or research training focus;
- Instrumentation used primarily for standard science and engineering courses.
- Renovation or modernization of research facilities, supporting equipment, and general purpose research platforms.
- Instrumentation related to animal models of disease-related conditions or the development or testing of drugs or other procedures for their treatment
- *However*, bioengineering instrumentation that advances engineering research and knowledge, applies engineering principles to problems in biology and medicine, aids persons with disabilities, and may also have clinical uses or diagnosis- or treatment-related goals *is* eligible for support.



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

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Programs

Major Research Instrumentation (MRI)

MRI Proposals

- Submission limit:
 - an organization may submit or be included as a funded subawardee/subcontractor in no more than three MRI proposals. No more than two proposal submissions may be for instrument acquisition.
 - if an organization is on three MRI proposals, at least one of the three proposals must be for instrument development.
- 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***
- At the time of submission, PI's are asked to identify an NSF division to review proposal

Note: A revised version of the NSF Proposal & Award Policies & Procedures Guide (PAPPG), NSF 09-1, was issued on October 1, 2008. Proposals responding to a funding opportunity with a due date on or after April 06, 2009 must now comply with the guidelines in NSF 09-29.



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

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Programs

Major Research Instrumentation (MRI)

Eligible Organizations

- Ph.D. granting institutions of higher education are academic institutions that have produced more than 20 Ph.D.s or D.Sci.'s in all NSF-supported fields of science, mathematics or engineering during the combined previous two academic years
- Non-Ph.D. granting institutions of higher education (i.e., bachelor and/or master degree granting academic institutions) are two- and four- year colleges and universities that have produced 20 or fewer Ph.D.s or D.Sci.'s in all NSF-supported fields of science, mathematics, and engineering during the combined previous two academic years.
- Non-degree granting organizations are independent nonprofit organizations, museums and science centers, and consortia of organizations working in NSF-supported fields of science, mathematics, and engineering.



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

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Programs

Major Research Instrumentation (MRI)

Program Solicitation: NSF 09-502

- Proposals considered for Instrument Acquisition (3 years) or Instrument Development (5 years)
- Number of Anticipated awards based on FY09 request of \$115 million:
~235, including up to 8 mid-scale (\$2-4 million) awards¹
- Anticipated award size:
\$100,000 to \$2 million for development proposals
\$100,000 to \$4 million for acquisition proposals²
(no minimum for non-Ph.D. granting institutions and for mathematical and social, behavioral and economic sciences)

1 Information based on the FY 2009 plan

2 Requests over \$2 million considered for the acquisition of a single instrument only. Acquisition proposals requesting \$2 million or less considered for a single instrument, a large system of instruments, or multiple instruments that share a common or specific research focus.



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

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Programs

Major Research Instrumentation (MRI) *2008 Award Snapshot - Overall*

Number Reviewed: 810

Dollars Requested : \$515.8 million

Number of Awards: 224 (39 DEV, 185 ACQ)

MRI Amount Awarded: \$93.2 million

NSF Amount Awarded: \$101.0 million

Overall Success Rate: 27.7%

Mean Award: \$451,000

Median Award: \$330,000

Number of Institutions that Participated: 449

Number of Institutions Awarded: 184

Data currently omit 1 MRI late award that
was made but not using MRI funds



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Programs

Major Research Instrumentation (MRI)

2008 Award Snapshot by Institution Type

	Ph.D.	non-Ph.D.	Non-degree	MSI
# reviewed	472	304	34	74
Mean request	\$765 K	\$430 K	\$704 K	\$555 K
Median request	\$568 K	\$323 K	\$559 K	\$397 K
# awards	129	84	11	24
NSF \$ awarded	\$73.7 M	\$22.4 M	\$4.8 M	\$9.8 M
MRI \$ awarded	\$67.8 M	\$21.2 M	\$3.9 M	\$9.3 M
Success rate	27.3%	27.6%	32.4%	32.0%
Mean award	\$571 K	\$267 K	\$440 K	\$407 K
Median award	\$465 K	\$211 K	\$474 K	\$309 K



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Programs

Major Research Instrumentation (MRI) *2008 Award Snapshot - EPSCoR*

Number of Proposals Reviewed: 181

Dollars Requested : \$116.5 M

Number of EPSCoR-eligible Awards: 50

Amount Awarded to EPSCoR-eligible Awards: \$20.2 M

EPSCoR Amount Awarded to MRI Awards: \$2.0 M

EPSCoR-eligible Success Rate: 27.6%

Eligible proposals co-funded by EPSCoR: 17

Mean award: \$404,000

Median award: \$295,000



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Programs

Major Research Instrumentation (MRI) *1998-2008 Award Snapshot¹*

FY	# Proposals	\$ Requested	# Awards	MRI Funding	Total NSF Funding*
1998	479	\$248.5	165	\$49.9	\$56.4
1999	472	\$261.5	166	\$49.9	\$56.8
2000	475	\$252.0	163	\$49.9	\$54.7
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
TOTAL:	7,590	\$4,030.9	2,626	\$852.2	\$922.3

¹includes only awards submitted directly to MRI program

*includes MRI funds and contributions from Directorates and Offices



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American Recovery and Reinvestment Act (Public Law 111-5)

NATIONAL SCIENCE FOUNDATION

RESEARCH AND RELATED ACTIVITIES

For an additional amount for “Research and Related Activities”, \$2,500,000,000: *Provided, That \$300,000,000 shall be available* solely for the Major Research Instrumentation program and \$200,000,000 shall be for activities authorized by title II of Public Law 100–570 for academic research facilities modernization.



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American Recovery and Reinvestment Act (Public Law 111-5)

Observations

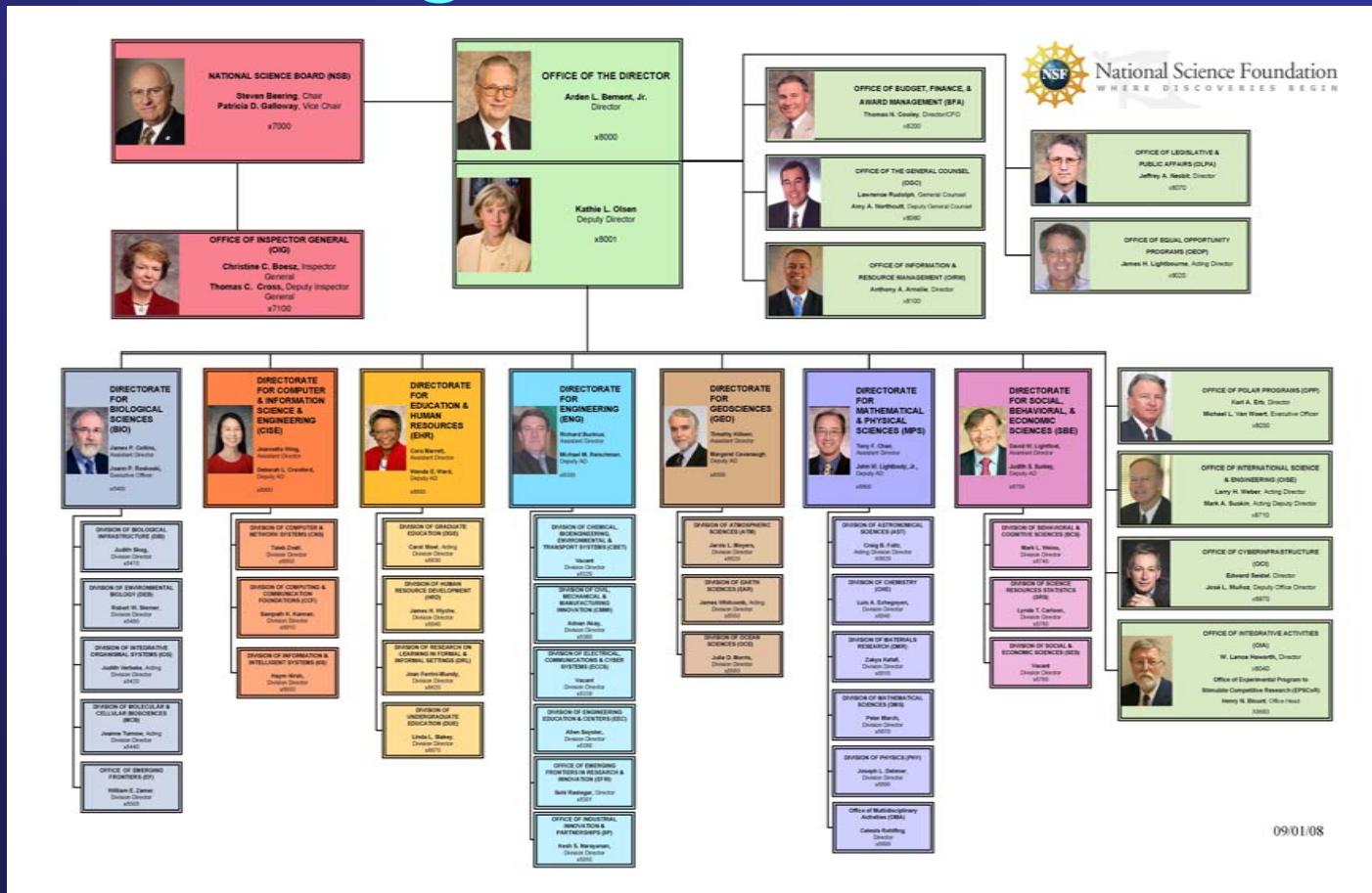
- There are many rumors circulating about implementation of the ARRA by NSF...
- The Foundation is currently planning implementation of its portion of the ARRA, consistent with NSF policies and practices, and OMB and legislative requirements...
- New solicitations will be posted in the spring for MRI and ARI (NSF Important Notice #131)
- Information is posted at <http://www.nsf.gov/recovery/>
- For MRI-specific information, see <http://www.nsf.gov/od/oia/programs/mri>

Please stay tuned!



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Finding a Home at NSF



09/01/08



Directorates/Divisions → Colleges/Departments

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Seeking Funding from NSF

Understand NSF before considering a proposal!

- Know the Website (www.nsf.gov)
- Search Recent Awards (www.nsf.gov/awardsearch)
- Identify possible funding opportunities (www.nsf.gov/funding)
- Talk to Program Officers in Divisions where you fit
- Know the “Proposal and Award Policies and Procedures Guide” (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf091)
- Know program requirements
- Serve as a panelist!
- Talk to successful PIs
- Know NSF’s role compared to other Federal agencies



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NSF Overview

What makes an MRI proposal fail before it is reviewed?

- Proposals describing activities that fall outside of the scope of those supported by the MRI program;
- Proposals describing activities that fall outside of the scope of those supported by NSF;
- Proposals that do not adequately distinguish development efforts from acquisition or basic research efforts;
- Proposals that exceed an organization's submission limit;
- Proposals that represent standard research projects appropriate for submission to regular NSF programs;
- Proposals to place an instrument at a facility of another Federal agency or one of their FFRDCs that are not submitted by consortia;
- Proposals to place an instrument at a facility currently receiving funding through the NSF Major Research Equipment and Facilities Construction (MREFC) account;

These proposals will be Returned Without Review!



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NSF Overview

What makes an MRI proposal fail before it is reviewed?

- Applicable proposals that do not indicate appropriate levels of cost-sharing, **and** that do not contain required documentation demonstrating organizational commitment;
- Proposals that do not contain required supplemental documentation or that contain supplemental documentation other than those required and/or encouraged by the MRI program;
- Proposals that do not conform to font, margin and page limitations;
- Proposals that do not separately address the Intellectual Merit and Broader Impacts in the Project Summary;
- Proposals that do not contain a Management Plan in the Project Description;
- Applicable proposals that do not contain Results from Prior MRI Support in the Project Description.

These proposals will be Returned Without Review!



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NSF Overview

What makes an MRI proposal fail during the review?

- Proposals that do not demonstrate adequate institutional commitment;
- Proposals that do not adequately demonstrate how and by whom the instrument will be utilized, operated and maintained – i.e., proposals without a strong management plan;
- Proposals that do not demonstrate shared-use within the institution, and/or among institutions;
- Proposals that request instrumentation that is otherwise reasonably accessible;
- Proposals that do not adequately match the budget to the scope of the project;
- Proposals that do not describe research training, particularly among groups underrepresented in science and engineering;



These proposals will be not review well!

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NSF Overview

So what makes an MRI proposal competitive?

Note I say “competitive”, rather than “successful”!

Due (in part) to budget limitations, ~1/4-1/3 of submitted proposals are funded

Good proposals may not get funded



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NSF Overview

So what makes an MRI proposal competitive?

***An obvious first step
is to avoid the pitfalls
I have already
mentioned!***



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NSF Overview

But what can make an MRI proposal actually succeed?

- Describe (enthusiastically) compelling research / research training activities undertaken by the participants in your proposal → more of the same, while adequate is not compelling;
- Demonstrate how your activities will contribute within and across disciplines in both research and research training → unique contributions fare better than keeping up with the competition;
- Match your proposed effort to the mission of your institution and describe it in that context → convince reviewers that an award will build capacity to meet well thought out programmatic / institutional goals;
- Alignment with regional goals can be of value → societal goals;
- Demonstrate appropriate leadership and commitment to bring the project to completion → convince reviewers an award would lead to intended results;
- Match the budget / requested resources to the scope of the project → ask for what is needed, no more, no less – justify the request;



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