

National Science Foundation

Major Research Instrumentation (MRI) Webcast

Program Summary and 2012 Competition Overview

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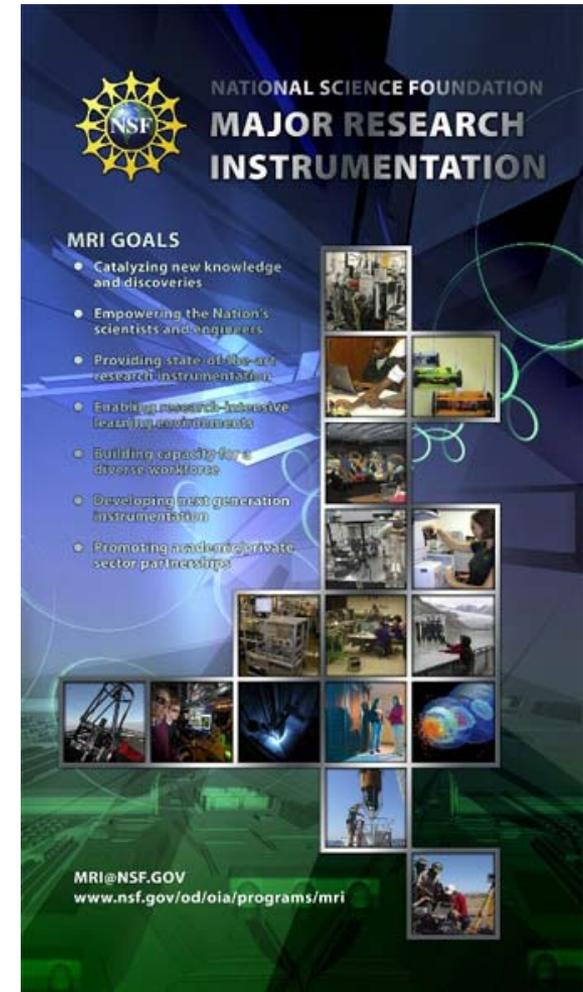
<http://www.nsf.gov/od/oia/>



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Presentation Overview

- *NSF and NSF Proposals*
- *The MRI Program*
 - *MRI Overview*
 - *MRI in 2012*
 - *Summary of MRI in 2011*
- *MRI Proposals*
 - *What Makes a Proposal Fail*
 - *What Makes a Proposal Competitive*



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NSF Overview



Physically located in Arlington, VA
Virtually located at <http://www.nsf.gov/>



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NSF Funding Opportunities

- **Program Description**

Published only on the NSF website.

Proposals must follow GPG (Grant Proposal Guide) 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.

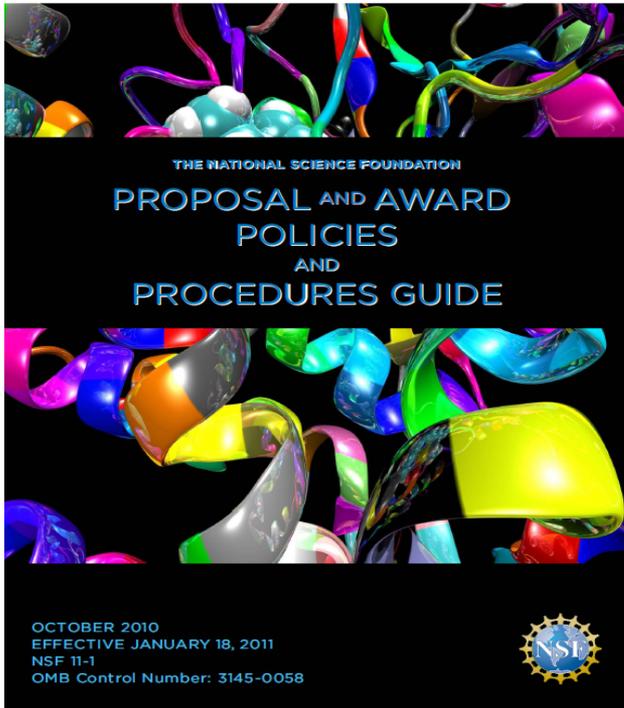
*Solicitations are also published at www.grants.gov



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FastLane Submitted Proposals

The Proposal & Award Policies & Procedures Guide (PAPPG) and the Grant Proposal Guide (GPG)



The Proposal & Award Policies & Procedures Guide (PAPPG) describes the proposal and award process

- **Part 1 - Grant Proposal Guide (GPG) provides guidance for preparation and submission of NSF proposals**
- **Part 2 – Guidance on managing and monitoring awards**

NSF 11-1 is effective for proposals submitted or due on or after January 18, 2011.

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp



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Grants.gov Option

Grants.gov Application Guide

The NSF Grants.gov Application Guide describes the preparation of proposals via Grants.gov.

Simultaneously submitted “linked collaborative” applications must be submitted via FastLane because Grants.gov does not currently support this type of submission.

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide



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The Major Research Instrumentation (MRI) Program¹

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

¹The 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 Strategic Goals

- Supporting the *acquisition* (**ACQ**) 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* (**DEV**) 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 & cross-disciplinary units, and multi-organization collaborations to integrate research with education.



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

FAQ: Is mine a development effort?

A: Development efforts typically have, for example, some/all of the following characteristics:

- Provides an instrument with *new capabilities not available from vendors*;
- Requires *design work* undertaken *in-house*, not relying on published designs;
- Benefits from a *team* that brings *a variety of skills* to the project;
- Requires *many person-hours*, more so than simple "assembly" of purchased parts;
- *Timeframe for completion is longer* than for plug-and-play or assembled instruments;
- May require a machine shop or a testbed to *fabricate/test unique components*;
- Have potential *risks* in achieving the specifications → a *risk mitigation plan* is required.

Although all of the above are not required, the more of these characteristics that apply, the more solidly the effort fits as a development effort (even if there is substantial acquisition of component parts).



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Development Proposals: Cautionary Notes

- *Outsourcing the development effort to a private sector partner(s) is viewed as a “custom acquisition” proposal (i.e., an MRI ACQ)*
- *Simple assembly of acquired components to create a new capability is most likely an MRI ACQ*



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

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Major Research Instrumentation: Additional Program Goals

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



<http://www.nsf.gov/od/oia/programs/mri/>
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FAQ: What Will MRI *Not* Support?

A: Among the items MRI *does not* support are:

- ***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 or platforms, manned vehicles);
- ***Instrumentation used primarily for science and engineering education courses.***



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

- *MRI does not support requests for multiple instruments to outfit labs/facilities*
- *MRI supports ACQ/DEV of a single instrument or multiple pieces of equipment that together serve as an integrated research instrument*



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

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FAQ: I had planned to request multiple instruments – do they constitute an integrated instrument?

A: Characteristics to look for:

- *Ensemble of equipment defining the instrument enables a specific experiment or type of experiment...*
- *Removing an element precludes an experiment from occurring or succeeding...*
- *Having (e.g.,) one or two pieces would serve little/no useful purpose...*
- *Components are so interconnected that if a core component were relocated all pieces would follow and not be “repurposed”...*
- *“Peer-level” instruments usable independently are not integrated instruments even though they may integrate research disciplines.*



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

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FAQ: Will NSF fund NIH-related Projects?

A: Among the instruments MRI **does not** support are:

- **Those to be used in medical education** (e.g., in medical courses)
- **Those intended for research with disease-related goals** (including work on the etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals)
- **Those intended for animal models of the above conditions**
- **Those intended for the development and /or testing of drugs or procedures for the treatment of the above conditions**

However MRI does support instruments:

- **For bioengineering research with diagnosis- related or treatment-related goals** (that applies engineering principles to biology and medicine while advancing engineering knowledge) **and/or to aid persons with disabilities**
- **For bioinformatics and biocomputing**



<http://www.nsf.gov/od/oia/programs/mri/>
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MRI Proposals – The Basics

- **Restrictions on organization submission eligibility** - see solicitation NSF 11-503 and next slide
- **Submission limit** - Three (3) per organization: *If three proposals are submitted, at least one of the 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.***
- **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.

Note: Proposals responding to a funding opportunity with a due date on or after January 18, 2011, must comply with the guidelines in NSF 11-1.



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



<http://www.nsf.gov/od/oia/programs/mri/>
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FAQ: Classification of Organizations

Note the distinction between “Ph.D.-granting”, “non-Ph.D.-granting” and “non-degree-granting” organizations

i.e., an organization that is not “Ph.D.-granting” is not necessarily “non-Ph.D.-granting”

Also, submission of “RUI” proposals/documents is not allowed



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

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MRI FY 2012 Program Solicitation

NSF 11-503¹

- Proposals considered for **Instrument Acquisition** (3 years) or **Instrument Development** (5 years)
- **Number of Anticipated Awards** based on anticipated FY12 budget of **\$90 million²**:
 - ~**150-175 awards³** overall
 - (up to \$35 million for \$1-4 million awards^{2,3})
- **Anticipated Award Size:**
\$100,000 to \$4 million for either acquisition or development proposals
(no minimum for proposals from non-Ph.D. granting institutions or proposals for fields of mathematical and social, behavioral and economic sciences)

¹To be used for the FY 2012 competition (Deadline: January 26, 2012)

²Subject to availability of funds ³Subject to proposal quality



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MRI Program Solicitation NSF 11-503

Significant Changes Began in FY11

- Inclusion of voluntary committed cost sharing is prohibited.
- All proposals must describe **plans for data management** and sharing of products of research, or assert the absence of need for such plans.
- Guidance for proposals that locate instruments at an organization other than the submitting organization.
- Categorization of the requested instrument using codes provided.
- Organization commitment letter must list previous MRI awards to organization from the past five years.
- Requirement for “project outcomes report” available to public 90 days following the expiration of the award.



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2011 MRI Award Snapshot - Overall

Number Reviewed: 859 (201 DEV, 658 ACQ)
Dollars Requested: \$576.4 million
Mean Dollars Requested: \$671,000
Median Dollars Requested: \$477,000
Number of Awards: 187 (45 DEV, 142 ACQ)
MRI Amount Awarded: \$88.1 million
NSF Amount Awarded: \$100.2 million
Overall Success Rate: 21.8%
Mean Award: \$536,000
Median Award: \$433,000
Number of Institutions that Participated: 462
Number of Institutions Awarded: 169



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2011 MRI Award Snapshot

By Institution Type

	Ph.D.	non-Ph.D.	Non-degree	MSI
# reviewed	506 (30% DEV)	312 (11% DEV)	41 (29% DEV)	75 (25% DEV)
Mean request	\$784 K	\$453 K	\$934 K	\$545 K
Median request	\$590 K	\$341 K	\$761 K	\$377 K
# awards	104	74	9	18
NSF \$ awarded	\$70.5 M	\$24.5M	\$5.2 M	\$7.4 M
MRI \$ awarded	\$61.4 M	\$21.7 M	\$5.0 M	\$6.0 M
Success rate	20.6%	23.7%	22.0%	24.0%
Mean award	\$678 K	\$331 K	\$580 K	\$411 K
Median award	\$523K	\$312 K	\$472 K	\$299 K



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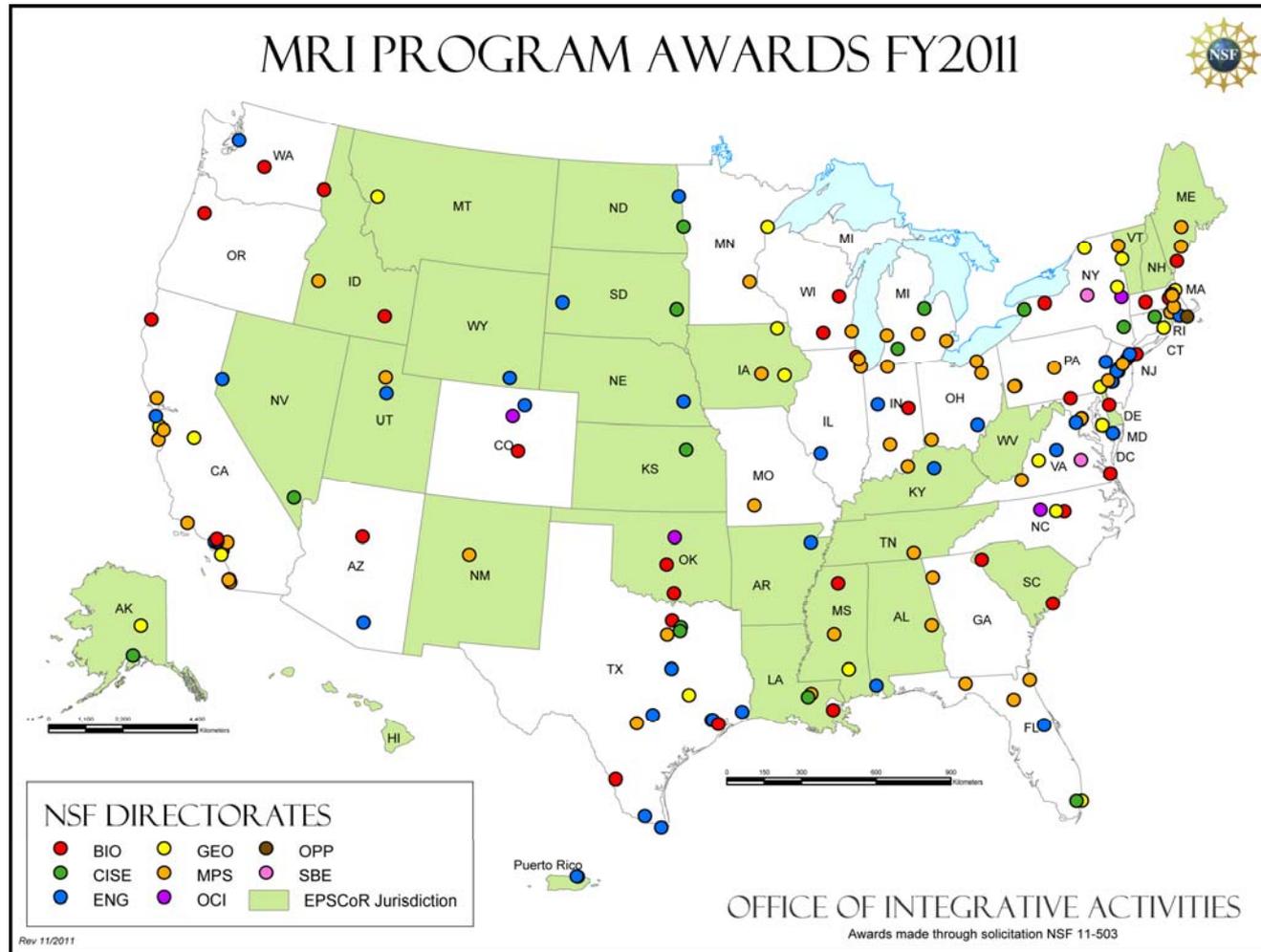
2011 MRI Award Snapshot - EPSCoR

Number of Proposals Reviewed: 199
Dollars Requested : \$124.8 M
Number of EPSCoR-eligible Awards: 50
EPSCoR-eligible Success Rate: 25.1%
Amount Awarded to EPSCoR-eligible Awards: \$25.8 M
Eligible proposals co-funded by EPSCoR: 18
EPSCoR Awarded to EPSCoR-eligible Awards: \$3.9 M
Mean award: \$515,000
Median award: \$390,000



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FY 2011 MRI Award Snapshot



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What Makes an MRI Proposal Fail?

What Makes an MRI Proposal Competitive?



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

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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 academic-private sector partnerships

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

The poster features a grid of small images showing various research instruments and scientists working in laboratories. The background is a dark blue and green abstract design with glowing lines and circles.

Understand NSF before considering a proposal!

- Know the NSF Website (www.nsf.gov)
- Search Recent Awards (www.nsf.gov/awardsearch)
- Identify appropriate funding opportunities (www.nsf.gov/funding)
- Talk to Program Officers in Division(s) “where you fit”
- Know the “Grant Proposal Guide”
- Know the program purpose, goals, and requirements – read the solicitation!
- Serve as a panelist when possible
- Talk to successful PIs
- Know NSF’s role compared to other Federal agencies



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MRI Proposals

- *What makes an MRI proposal fail before the review?*
 - *Know the reasons why a proposal may be Returned without Review*
 - *A checklist is provided in the solicitation – use it to be sure your proposal is complete and compliant.*

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



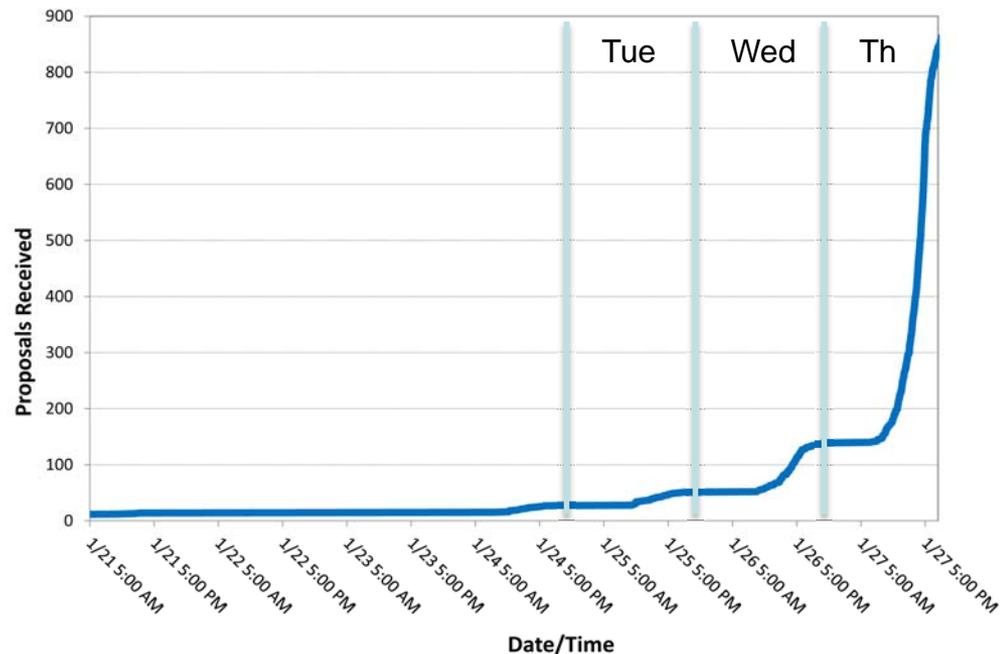
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Important Takeaway

Submit early and check that what was received at NSF is what you intended to submit!

You can always revise and resubmit proposals prior to the deadline, but not afterwards!

FY2011 MRI Proposal Deadline: 01/27/2011, 5 PM Local Time



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

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 for groups underrepresented in science & engineering or persons with disabilities.

These proposals will not review well!



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MRI Proposals

So what makes an MRI proposal competitive?

Note the term “competitive”, rather than “successful”!

Due (in part) to budget limitations, 20-25% of submitted proposals are funded

Good proposals may not get funded



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MRI Proposals

So what makes an MRI proposal competitive?

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



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MRI Proposals

So what makes an MRI proposal competitive?

Build your case on its merits

What is the intellectual merit of the proposed activity?

What are the broader impacts of the proposed activity?

- Describe (enthusiastically) compelling research / research training activities to be undertaken with the instrument. *Buy/Build it and they will come is not necessarily a good reason...*
- Demonstrate how your activities will make meaningful contributions within and across disciplines in both research and research training. *Why are you the ones best able/positioned to make a contribution?*
- Establishing a *need* is usually not enough. *Doesn't everyone need one?*
- Match your proposed effort to the mission/goals of your institution. *MRI awards build institutional capacity...*



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MRI Proposals

Some Additional Thoughts...

- Demonstrate appropriate leadership and commitment to bring the project to completion. *Being a good research scientist is one thing, being a good manager is quite another...*
- How would the project enable the integration of research and education? *MRI is a Research and Research Training program.*
- How would the project enable integrating diversity into NSF programs, projects, and activities? *Saying it will is not enough!*
- Ask for what you need, no more no less. *Bells and whistles may be nice but not needed..*
- Avoiding pitfalls (*i.e.*, “Don’t Do This”) will not guarantee a competitive proposal. *So your proposal is technically flawless but is it compelling?*



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MRI Proposals

Some Additional Thoughts...

The opposite of “Don’t Do This” is a vast range of possible approaches, strategies, and designs for your proposal.



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MRI Proposals

Some Additional Thoughts...

Think like a reviewer

- *What “story” would you want to hear?*
- *If you wonder if reviewers will have a concern, almost certainly they will!*
- *MRI, like other grants programs, is a competition – what makes your proposal stand out?*



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Questions?



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