

National Science Foundation

What Makes an MRI Proposal Fail, What Makes an MRI Proposal Competitive?

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



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A graphic titled 'NATIONAL SCIENCE FOUNDATION MAJOR RESEARCH INSTRUMENTATION'. It features the NSF logo and a list of 'MRI GOALS' with corresponding small images illustrating each goal. The goals include: 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; and Promoting academic-private sector partnerships. At the bottom, it provides the contact information: MRI@NSF.GOV and www.nsf.gov/od/oia/programs/mri.

**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

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 Divisions where you fit
- Know the “Proposal and Award Policies and Procedures Guide” (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp)
- Know program purpose, goals, and requirements
- Serve as a panelist!
- 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 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 (rare);
- Proposals that augment the scope of facilities receiving funding through the NSF Major Research Equipment and Facilities Construction (MREFC) account (rare);

These proposals are subject to Return Without Review!



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MRI Proposals

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 are subject to Return Without Review!

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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 among groups underrepresented in science and engineering;



These proposals will be *not* review well!

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MRI Proposals

So what makes an MRI proposal competitive?

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

Due (in part) to budget limitations, ~1/4 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

But what can make an MRI proposal actually succeed?

- Simply avoiding the known pitfalls (i.e “Don’t Do This”) will not guarantee a competitive proposal.
- The opposite of “Don’t Do This” is a vast range of possible approaches, strategies, and designs for your proposal.
- NSF program officers can’t tell PIs exactly how to construct a competitive proposal – the PI has to make their own decisions on how to craft their proposal.



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NSF Merit Review Facts

So what makes an MRI proposal competitive?

Some background on Merit Review:

- All proposals submitted to NSF are reviewed according to the two merit review criteria: Intellectual Merit and Broader Impacts.*
- NSF Program Officers make recommendations to fund or decline a proposal.
- Most proposals that are awarded do not receive all “Excellent” ratings.
- NSF Program Officers are encouraged to recommend “risky” science and engineering for funding.
- Principal Investigators submit on average about 2.1 proposals for every award they receive.
- NSF promotes broadening participation in science and engineering.
- NSF annually has active awards at over 2000 awardee organizations.



See <http://www.nsf.gov/bfa/dias/policy/meritreview/facts.jsp>

*Programs solicitations may have additional merit review requirements.

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MRI Proposals

But what can make an MRI proposal actually succeed?

- Describe (enthusiastically) compelling research / research training activities to be undertaken by the participants in your proposal
 - More of the same, while adequate is not compelling.
 - Describe the specific scientific outcomes and broader impacts in enough detail to establish the merit of your proposal.
 - Establishing the “need” is usually not enough.



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MRI Proposals

But what can make an MRI proposal actually succeed?

- Demonstrate how your activities will make meaningful contributions within and across disciplines in both research and research training
 - Explain the value (impact) of your contributions, e.g. could it open up a whole new area for scientific discovery that is aligned with major societal goals?
 - Unique contributions fare better than keeping up with the competition;



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MRI Proposals

But what can make an MRI proposal actually succeed?

- Match the budget / requested resources to the scope of the project
 - Ask for what is needed, no more, no less – justify the request;
 - The scientific and broader impacts drivers must justify the resources being requested.



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MRI Proposals

But what can make an MRI proposal actually succeed?

- Justify the need for personnel and clearly define the role of each member of the team
 - Ask for what is needed, no more, no less – justify the request;
 - If appropriate, describe how participation by specific personnel will contribute to the Nation's ability to develop the next generation of scientific instrumentation



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MRI Proposals

But what can make an MRI proposal actually succeed?

- 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.
 - Alignment with major societal goals can also be of value in building the merits of your proposal;



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MRI Proposals

But what can make an MRI proposal actually succeed?

- Demonstrate appropriate leadership and commitment to bring the project to completion
 - Convince reviewers an award would lead to intended results.
 - Provide a clear management plan for getting to the intended results.



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MRI Proposals

Some Final Thoughts.....

- Be clear.....
 - About what instrumentation and resources are being requested
 - About the justification for all resources being requested
 - About the outcomes (scientific and broader impacts) that are expected
 - About the value of these outcomes/contributions to a scientific discipline(s), MRI program goal, NSF strategic goal, and/or societal goal



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MRI Proposals

Some Final Thoughts.....

- Build your case on its merits (see NSF 10-529)....
 - What is the intellectual merit of the proposed activity?
 - What are the broader impacts of the proposed activity?
 - How would the project enable the integration of research and education?
 - How would the project enable integrating diversity into NSF programs, projects, and activities?
 - To what extent will the project make a substantial improvement in the institution's capabilities to:
 - conduct leading-edge research,
 - provide research experiences for undergraduate students using leading edge-facilities,
 - broaden the participation in science and engineering research by women, underrepresented minorities and persons with disabilities.



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MRI Proposals

Some Final Thoughts.....

- Questions



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