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8 MAY 2025

National Science Foundation

Major Research Instrumentation (MRI)

Program Intelligence Guide Debrief

Overview

About McAllister & Quinn

Washington, DC-based consulting firm

Founded in 2004

Specialize in securing funding for a wide range of organizations

Team of grants experts

90+ staff from Legislative and Executive branches, Academia, non-profits, & industry

250+ grant writers, consultants & subject matter experts

Overview

The NSF MRI program ***"provides support to acquire critical research instrumentation, without which advances in fundamental science and engineering research may not otherwise occur"***

Additionally, per the FOA, through the MRI program, NSF wants to fund the purchase of instruments that ***"are, in general, too costly and/or not appropriate for support through other NSF programs"*** The MRI program "does not typically fund common, general-purpose ancillary equipment that would normally be found in a laboratory and/or is relatively easily procured by the organization."

At the Fall 2020 Virtual Grants Conference, an MRI program officer noted that the MRI is an "institutional capacity building program."

MRI Program Analysis

Overview

The MRI program provides support to acquire critical research instrumentation. ***A competitive MRI proposal will highlight the benefits of new instrumentation, including problems that the equipment will solve and the impact on the community.*** Proposals must detail what the instrument will help accomplish. Proposals must also include:

Multi-user Community Approach: Intelligence from an MRI program officer indicates that "instruments should be used by a multi-user community" and that "the more users, the better off your proposal is going to be." ***Applicants should contact faculty in other departments and other institutions to determine if their proposed instrument would have wide, interdisciplinary use.***

Workforce Development Opportunities: Student involvement is important as the award is expected to enhance research training of students who will become the next generation of instrument users, designers, and builders. ***Applicants should consider if their proposed instrument would allow for new methods of training and education.***

Considerations of Broader Impacts: NSF wants to see a plan for how the proposed instrument will broaden the participation in science and engineering research by women, underrepresented minorities, and persons with disabilities.*

Instrument Type Analysis

- Per the FOA, NSF will NOT support requests for:
  - Construction, renovation or modernization of rooms, buildings or research facilities.
  - Large, specialized experimental facilities that are constructed with significant amounts of common building material using standard building techniques. Instruments should be decoupled from the structure or environment that contains them.
  - General purpose and supporting equipment. Supporting equipment refers to basic, durable components of a research facility that are integral to its operation and supporting facilities.
  - Sustaining infrastructure and/or building systems.
  - General-purpose platforms or environment.
  - Instrumentation used primarily for science and engineering education courses and outreach or enables research outside of NSF-supported fields of science and engineering. However, these activities may occur at a secondary level and serve as broader impacts.
  - Instrumentation to be used in medical education (such as medical school courses).

MRI Program Analysis

Technical Details

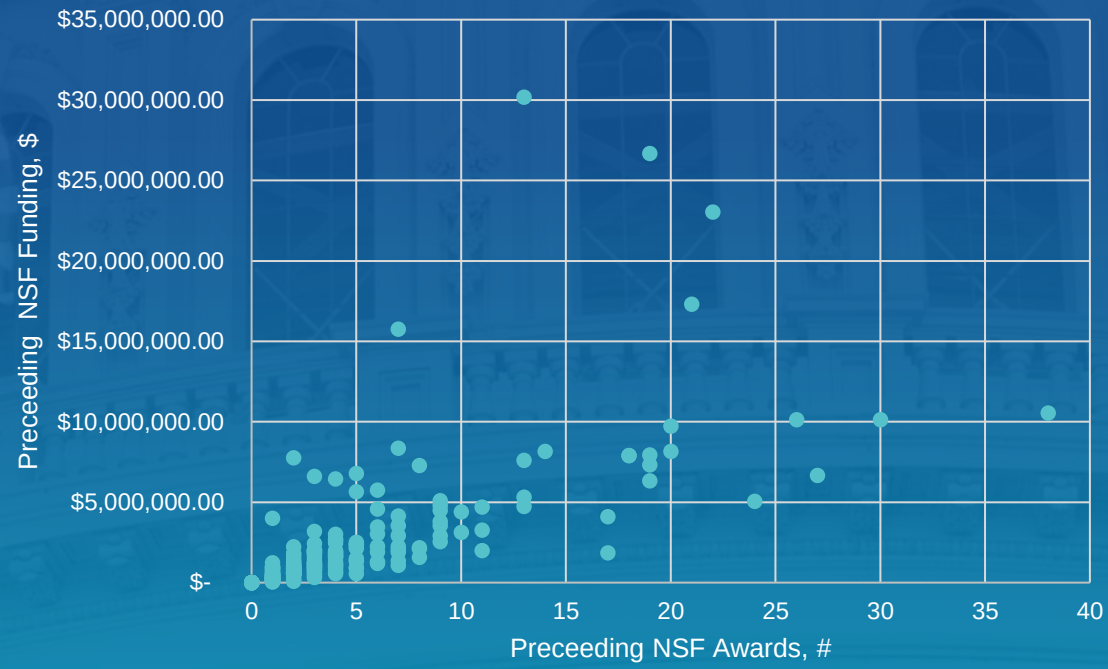
Solicitation Issued	November 23, 2022
Deadline Window	October 15, 2025 – November 14, 2025
Special Eligibility Notes	N/A
Limited Submission	**Yes** *Track 1:* 2 submissions per institution *Track 2:* 1 submission per institution *Track 3:* 1 submission per institution
Anticipated # of Awards	100
Anticipated $ Amount	$75 Million
Program Contacts	Randy Phelps rphelps@nsf.gov General Inquiry mri@nsf.gov

Program Page	**FOA**	**Webinar Recording**

MRI Program Analysis

PI Profile and Teaming

- Principal Investigators: PIs awarded in the MRI program have a varied history with NSF and have on average received 4 NSF awards totaling ~$2.4M at the time of their most recent MRI award. Several PIs have won multiple MRI awards throughout their careers. There is also a wide diversity in titles among past PIs, as 63% of FY23 awardees were either assistant or associate professors.



PI Profile and Teaming

- Teams: MRI Teams are typically multidisciplinary, with the average awardee proposal including personnel from 2 departments. This data aligns with the program's aim to ***"focus on multi-user/shared instrumentation that often supports research needs across disciplinary boundaries."***

Award Type	Average Team Size (PI and Co-PIs)	Average # of Represented Departments	% of Unique Departments to Team Size
Acquisition	4.2	2.5	60%
Development	2.8	1.4	50%
Track 1	4.2	2.5	60%
Track 2	3.7	2.0	54%
Track 3	3.0	1.8	60%
All	4.0	2.4	60%

CHIPS Act Implementation

- Per Section 10320 of Subtitle B of the CHIPS & Science Act of 2022, ***cost-sharing requirements for new awards in the Major Research Instrumentation (MRI) Program are waived for a period of 5 years, starting with the FY 2023 MRI competition.***
- Track 3 awards have been created to conform with CHIPS Act language from section 10373 to ***"support, through the Major Research Instrumentation program, proposal request that include the purchase, installation, operation, and maintenance of equipment and instrumentation to reduce consumption of helium."***
- Lastly, the solicitation cites section 10318 in the CHIPS act for ***encouraging MRI "proposals that facilitate U.S. leadership in microelectronics and training."***

Instrument Type Analysis

- Analysis of MRI award titles indicates that there are several commonly awarded instrument types. ***The most frequently mentioned terms among awarded titles were "spectro" and "micro."*** "Helium" has become a leading technical term, not only bound to Track 3 awards, but Track 1s as well.
- There are common non-instrument specific trends; for example, education and training are commonly mentioned in titles, indicating once again that ***advancement of workforce development is important within the program.*** Titles including multi- and interdisciplinary were also common, which highlights the ***importance of multi-user, multidiscipline instruments within the MRI program.***

Instrument Type Analysis

Common Technical Terms	Common Non-Technical Terms
• Spectro -meter, -scopy • Microscope • Materials • X-Ray • Helium • Neutron • Laser • Electron • Computing • Imaging	• Equipment • System • Research • Education • Training • Multidisciplinary • Interdisciplinary • Undergraduate

Carnegie Classification

- ***While R1s are frequently awarded MRI grants, there is a lot of opportunity for R2s and non-R1/R2 institutions, and these institutions make up a majority share (51% combined) of past awardees.*** In the most recent award class, the share of awards for non-R1/R2 institutions grew, while the R2 share shrank.

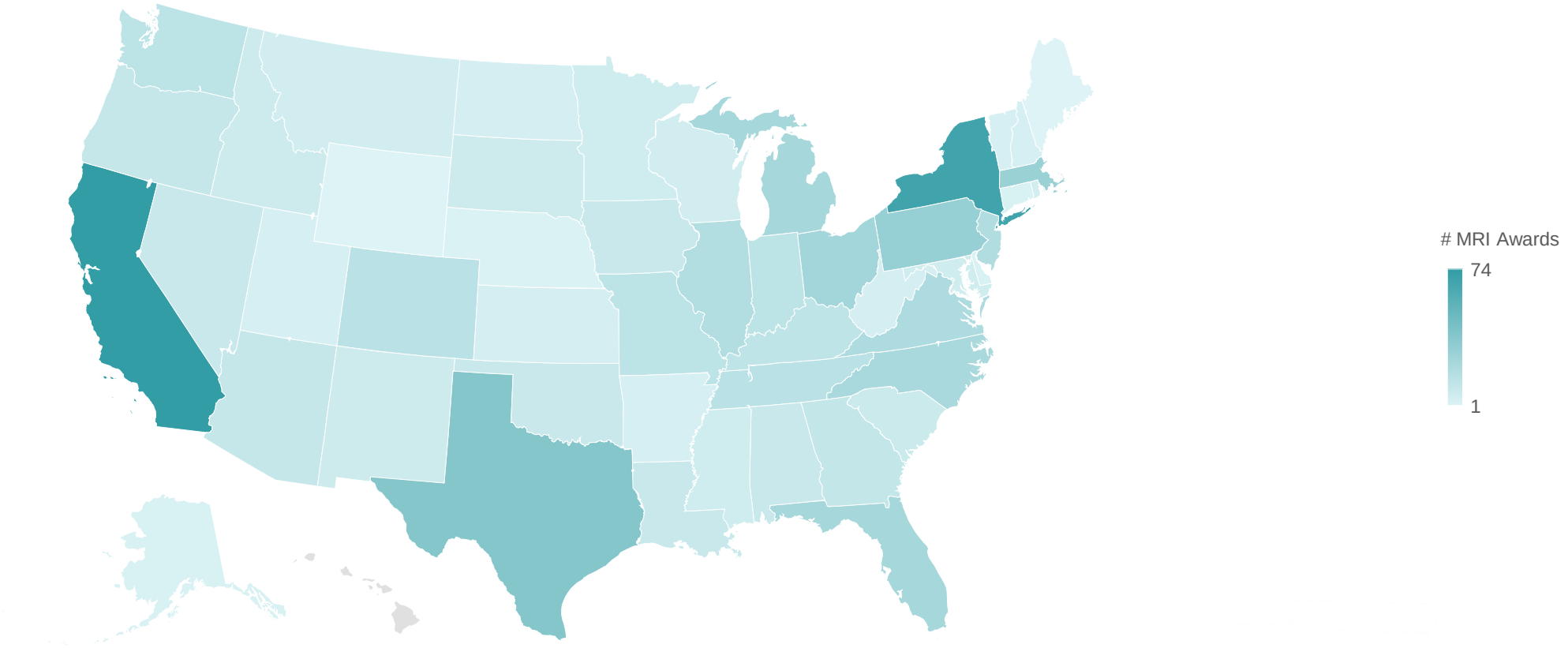
Institution Type	% of Award Share (FY19-Present)	% of Award Share (FY23)
R1: Doctoral Universities – Very high research activity	49%	47%
R2: Doctoral Universities – High research activity	21%	16%
Non R1/R2 Institutions	30%	37%

Geographic Considerations

- If your state is well-awarded, highlight if your proposed instrument would build local capacity. If your state is not well-awarded, ***highlight how your proposed instrument would build state-level, regional, and/or national capacity***. If a comparable instrument exists in your area, consider if there are travel and timing barriers to highlight why that instrument is not easily accessible for your purposes.
- The solicitation also includes new language highlighting EPSCoR regions noting that, “proposals from women, underrepresented minorities, persons with disabilities and early-career PIs are encouraged, as are proposals that benefit early-career researchers and proposals with PIs from geographically under-served regions, including EPSCoR jurisdictions.”

MRI Program Analysis

Geographic Considerations



Key Takeaways

- ***CHIPS Act Implementation:*** This program had been amended to comply with the CHIPS and Science Act. Changes include the introduction of Track 3 awards to fund helium conservation efforts and language encouraging proposals that focus on microelectronics research and training.
- ***Instrument Type Analysis:*** Analysis of award titles shows that commonly awarded instruments include spectro- and micro- instruments. Award titles also commonly reference workforce development and multi-user/multidisciplinary approaches.
- ***Carnegie Classification:*** R-2 and non-R-1/R-2 institutions make up 51% of past awards.
- ***Geographic Considerations:*** Applicants must articulate the impact of their proposed instrument on the research community at a regional or national level.
- ***PI Profile:*** PIs have a range of experience, but on average have received 4 NSF awards totaling ~$2.4M prior to an MRI award.

Questions?

McAllister & Quinn

1030 15th Street, NW, Suite 590 West | Washington, DC 20005

(202) 296-2741 | www.jm-aq.com