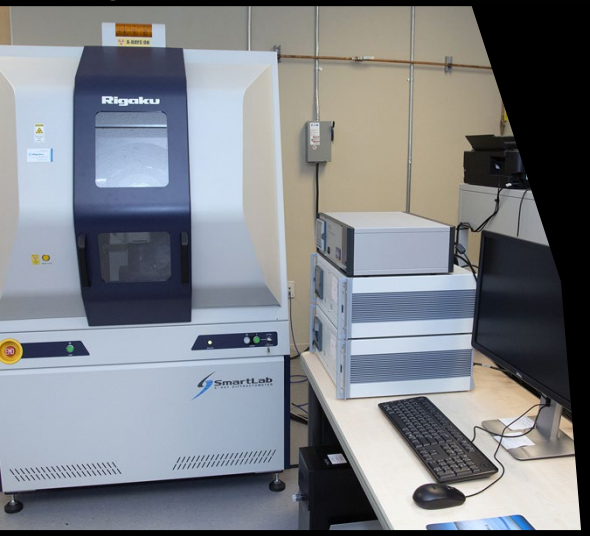
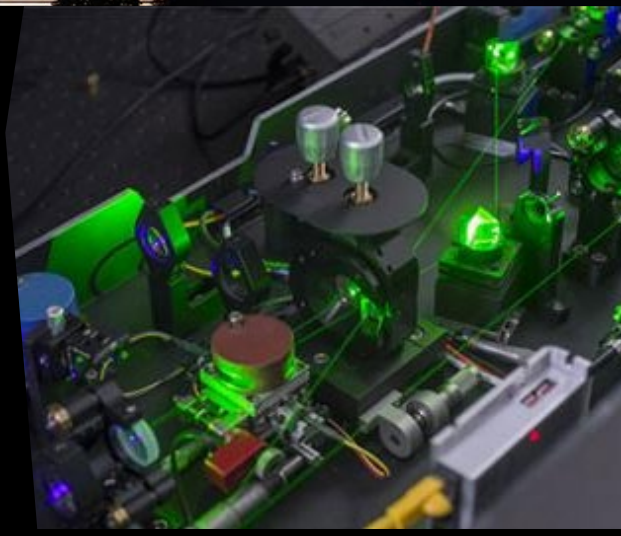
National Science Foundation
WHERE DISCOVERIES BEGIN





CHE MRI Office Hour

January 5, 2023

CHE – MRI Team

- Dr. Kenneth Carter
- Dr. Tanya Whitmer
- Dr. Jose Almirall
- Stephanie Smith

[Major Research Instrumentation Program (MRI) | NSF - National Science Foundation]

National Science Foundation
WHERE DISCOVERIES BEGIN

MRI Part I
The Basics

MRI

Strategic Goals

Supports the ***acquisition*** or ***development*** of a *major shared-use research instrument* that is, in general, *too costly or not appropriate for support through other NSF programs.* The instrument is expected to be *operational for regular research* use by the end of the award period.

AND

Enables academic departments, disciplinary & cross-disciplinary units, and multi-organization collaborations to integrate research with ***research training***

MRI

The solicitation beginning with the FY 2023 MRI Competition (NSF 23-519) has Some Significant Changes from Previous Years

- Proposals will be due by 5:00 p.m. local submitters time February 21, 2023.
- PAPPG: NSF 23-1 applies for proposals submitted or due on or after January 30, 2023.

MRI

Submission Window Planning

- *January 16, 2022 - February 21, 2023*
- *October 16, 2023 - November 15, 2023*

October 15, 2024 - November 15, 2024
October 15, 2025 - November 14, 2025
October 15, 2026 - November 16, 2026

Note the transition to new submission windows (deadlines) will happen after the upcoming MRI competition!

MRI

The CHIPS and Science Act of 2022

The "Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act of 2022", waives cost-sharing requirements for the MRI Program for a period of 5 years. NSF is implementing the waiver for new submissions beginning with the FY 2023 MRI competition.

The maximum MRI request from NSF remains $4 million. Since voluntary cost sharing is not permitted, the maximum total project cost of proposed projects is also $4 million.

MRI

Helium conservation and Microelectronics

A new track has been added ("Track 3") to incorporate opportunities, consistent with the "CHIPS and Science Act of 2022", for proposal requests that include the acquisition, development, installation, operation, and maintenance of equipment and instrumentation to reduce consumption of helium.

Consistent with guidance in the "CHIPS and Science Act of 2022", MRI encourages instrument proposals that facilitate U.S. leadership in microelectronics research and training.

MRI

Revised Tracks and Submission Limits

- **Track 1:** MRI proposals that request funds from NSF greater than $100,000[1] and less than $1,400,000.
- **Track 2:** MRI proposals that request funds from NSF greater than or equal to $1,400,000 up to and including $4,000,000.
- **Track 3:** MRI proposals that request funds from NSF greater than or equal to $100,000[1] and less than or equal to $4,000,000 that include the development, purchase, installation, operation, & maintenance of equipment and instrumentation to conserve or reduce consumption of helium.

[1]Track 1 proposals requesting funds from NSF less than $100,000 will be accepted only from: a) eligible performing organizations requesting instrumentation supporting research in the disciplines of mathematics or social, behavioral and economic sciences; or b) non-Ph.D.-granting institutions of higher education requesting instrumentation supporting research in any NSF-supported disciplines.

MRI

Revised Tracks and Submission Limits

Each performing organization may submit in *revised* "Tracks" *with no more than two (2) submissions in Track 1 and no more than one (1) submission in Track 2. For the newly defined Track 3, no more than one (1) submission per competition is permitted.*

As a result, it is now possible for an institution to submit up to four MRI proposals within the Track limits as described above.

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.

Note: Organizations that are not PhD-granting are not necessarily non-PhD-granting!

Instrument Development

- *NSF seeks to support MRI awards that develop next-generation research instruments that open new frontiers of research.*
- *Up to one-third of the MRI awards are expected to support instrument development in either of Tracks 1 or 2, and even Track 3.*

Within their submission limit, organizations are strongly encouraged to submit proposals for innovative development projects.

Reminder

MRI seeks broad representation of PIs and institutions in its award portfolio, including:

- *Minority-serving institutions*
- *Predominantly undergraduate institutions*
- *Geographically diverse institutions (e.g., in rural areas and EPSCoR jurisdictions)*
- *Under-resourced institutions so that MRI builds capacity for research*

and PIs who are:

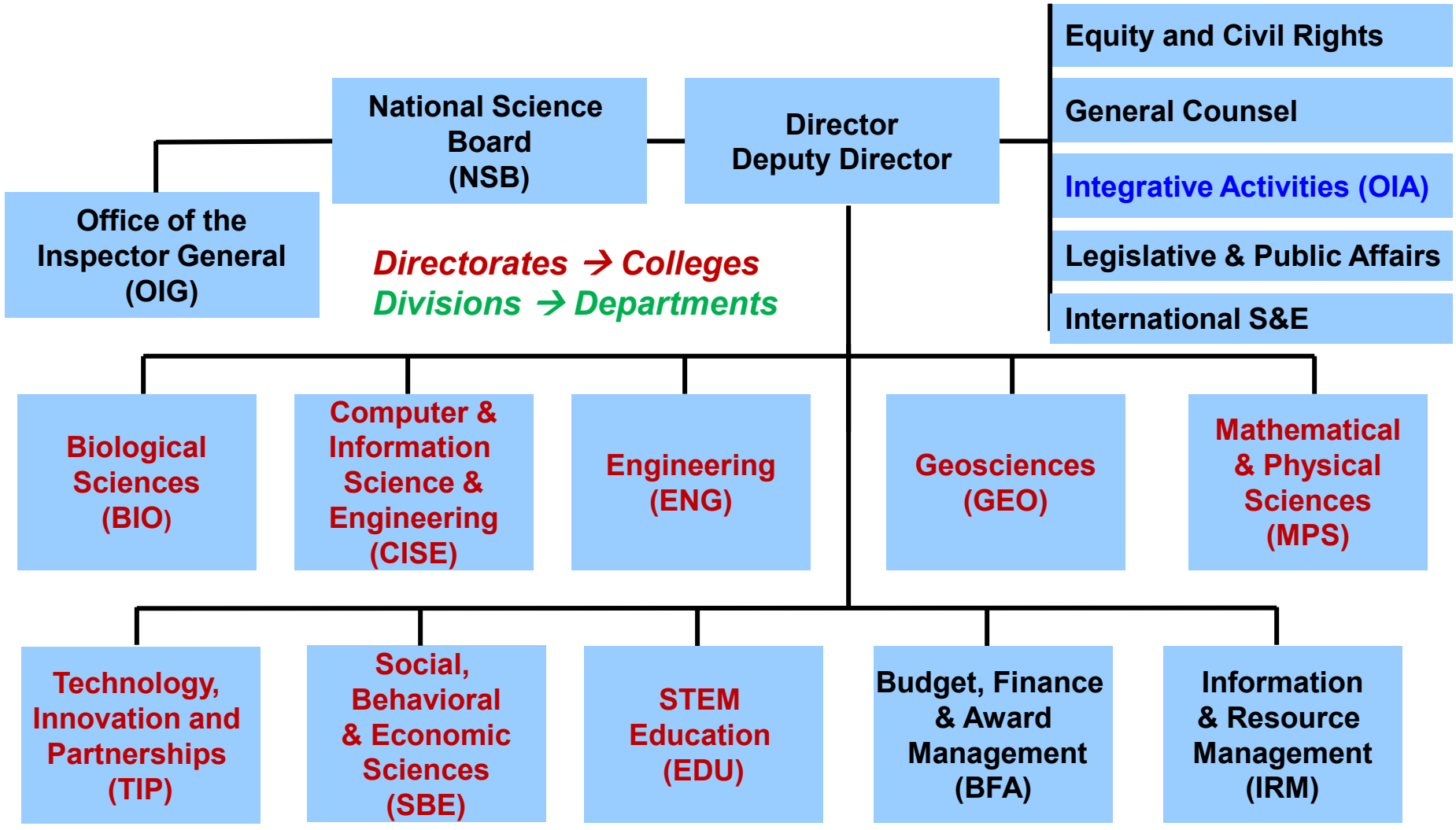
- *Women*
- *Early-career researchers*
- *In groups that historically have been marginalized in STEM*
- *Persons with disabilities*

National Science Foundation
WHERE DISCOVERIES BEGIN

MRI Part II
The Review Process

National Science Foundation
WHERE DISCOVERIES BEGIN

Finding a Home at NSF



Proposal Review and Award

- Proposals submitted to OIA with ****Division(s) preference indicated**.**
  → *OIA responsible for compliance, funds and portfolio monitoring*
- Proposals (mostly) reviewed in division(s) selected by PI. May be co-reviewed. *NSF reserves the right to place proposals in the proper home!*
- Divisions recommend awards (w/ OIA concurrence) and declines.
- MRI funding: OIA holds the MRI budget provided by Congress.
  - Initial funds allocated to Divisions based on proportion of total MRI $$ a Division is reviewing. → *Comparable success rate by divisions.*
    - Division funds further siloed by percentage of proposals from a) non-PhD/MSIs and b) PhD/non-degree → *Comparable success rate by institution-type.*
  - Some funds reserved for >$1 million meritorious Directorate-level priorities → *All Directorates have opportunity to make large (Track 2) awards.*
  - OIA holds a reserve for portfolio balance; some Divisions use their own program funds to support MRI; EPSCoR also contributes $$.

National Science Foundation
WHERE DISCOVERIES BEGIN

MRI Part III: Proposal "Best" Practices

Understand NSF before Considering a Proposal!

- Know the NSF Website (www.nsf.gov)
- Search Recent Awards (www.nsf.gov/awardsearch). Use Program Element 1189 (for MRI)
- Identify appropriate programs (www.nsf.gov/funding or links within https://nsf.gov/staff/orglist.jsp)
- 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)
- Serve as a panelist!
- Talk to successful PIs
- Know NSF's role compared to other Federal agencies

MRI Proposals

So, what makes an MRI proposal competitive?

Note the term "competitive", rather than "successful"!

Due (in part) to budget limitations, only a limited fraction of submitted proposals are funded

Not all strong proposals get funded

MRI Proposals

Think like a reviewer!

- *What "story" would you want to hear?* ***Science drives the request!***
- *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?*

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 a lackluster reason…*
- Demonstrate how your activities will make meaningful contributions within and across disciplines in both *research* and *research training*. *We are the ones best able/positioned to do this work!*
- Establishing a *need* is usually not enough. Everyone needs the best instrument. *What makes you unique?*
- Match your proposed effort to the mission of your institution and describe it in that context. *You are competing against your peer institutions, and MRI awards build institutional capacity…*

MRI Proposals

- Demonstrate appropriate leadership and commitment to make the project a success. *Being a good research scientist is one thing, being a good manager is quite another. My soapbox…*
- How would the project enable the integration of research and education? *MRI is a Research **and** Research Training program. (Education and Outreach are broader impacts.)*
- 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 are nice, but may be a minor part of the project...*
- Avoiding pitfalls (*i.e.,*"Don't Do This") will ***not*** guarantee a competitive proposal. *So, your proposal is technically flawless, but is it compelling?*

There is a vast range of possible approaches, strategies, and designs for your proposal.

MRI – CHE Best Practices

- **<u>Proposals May Not Request More that One "Well-Integrated" Instrument</u>**
  - Program is not intended to help create, equip, or maintain an Instrument FACILITY
  - Requests that contain additional equipment may be returned without review or jeopardize the proposal during the review
  - Inclusion of representative, itemized vendor quotes is required for all MRI proposals.
  - Include a letter documenting the performing institution's commitment to ensuring successful operations and maintenance over the expected lifetime of the instrument.

Helium Conservation & Recovery

For helium-related requests only: MRI will accept requests that include the acquisition, development, installation, operation, and maintenance of equipment and instrumentation to reduce consumption of helium. Consistent with the goals of the MRI Program, support for such requests will be limited to equipment and instrumentation that serve shared-use research instrumentation. Such a request may be part of a Track 1 or Track 2 proposal (within the budgetary limits that apply to those tracks) or be requested separately as a "Track 3" proposal.

Proposals in Track 1 and Track 2 that request support for an instrument that requires the use of helium must describe plans for the conservation, and/or recovery and reuse of helium;

Plans to submit a separate Track 3 proposal are not sufficient for this purpose.

Additionally,

- For all helium-related requests, current and/or anticipated helium expenses and use projections with and without recovery systems installed should be described in the proposal.
- For all helium-related acquisition requests, proposers should request a 36-month project duration, while development requests should request a 60-month project duration. These durations will allow time for reporting of impacts and efficiencies gained.
- For all helium-related requests, vendor quotations for helium conservation/recovery systems should be included in the "Other Supplementary Documents" section of the proposal.
- For all helium-related requests, current or planned shared-usage statistics and metrics should be provided in the proposal.
- For Track 3 proposals, the title of the proposal should begin with "MRI: Acquisition of Helium Recovery Equipment:" or "MRI: Development of Helium Recovery Equipment:" Please note that if submitting via Research.gov, the system will automatically prepend the title with "Equipment".

Helium-related Examples for Discussion:

Example One
Request for a new 400 MHz NMR at a non-PhD institution including *future plan* for the purchase of helium capturing equipment for shipping the compressed helium to neighboring large helium plant.

Example Two
Request for a full helium recovery system (including liquefaction) in support of centralized core facilities (NMR, EPR, etc.)

Example Three
Request for an upgraded console for a 20-year-old 500 MHz NMR *and* a full helium recovery system to support both the 500 MHz and an existing, newer 400 MHz NMR.

Example Four
Request for a benchtop NMR that does not require helium to replace an old 300 MHz teaching instrument.

Is the helium conservation or recovery plan **cost-effective**?

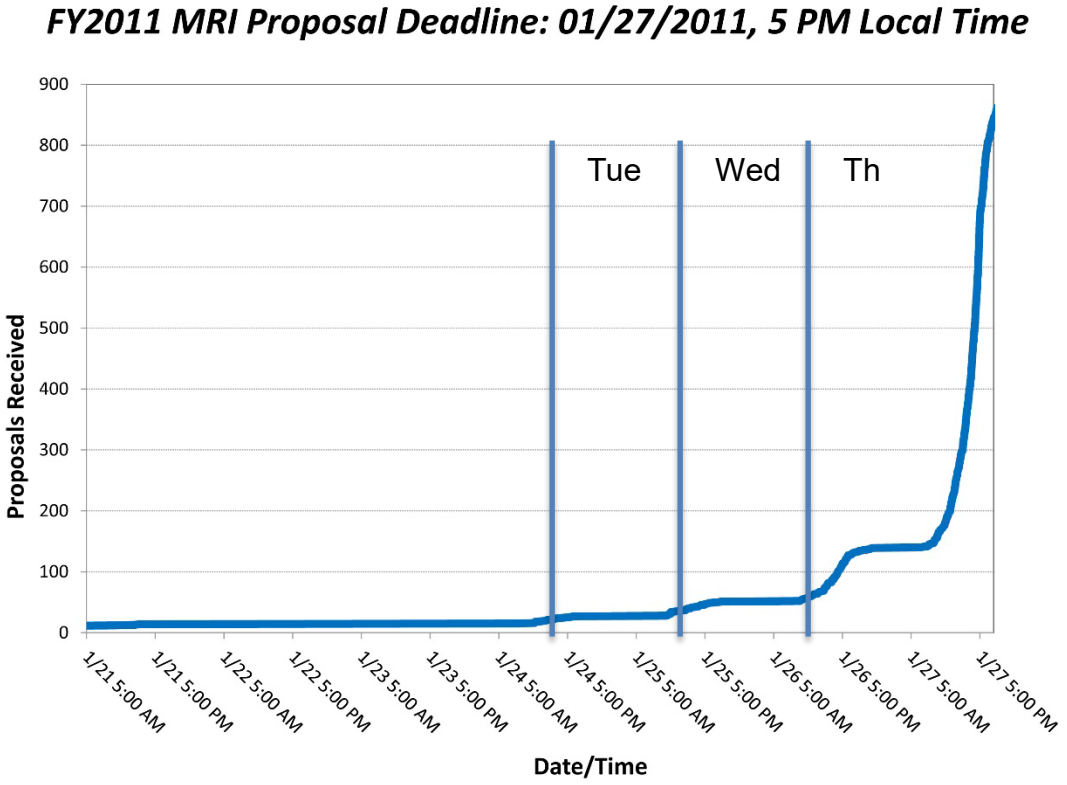
Is the helium conservation or recovery plan **appropriate for the scale of helium usage** at my institution?

What is the **impact** of the plan on my department and/or institution? Primarily chemistry-related?

Important Takeaway

Soapbox: 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! 80% of proposals are submitted on the deadline day, 50% within 2 hours of the 5pm deadline!



Thank You!

CHE – MRI Team – Reach Out to Us!

- **Dr. Kenneth Carter (krcarter@nsf.gov)**
- **Dr. Tanya Whitmer (twhitmer@nsf.gov)**
- **Dr. Jose Almirall (jalmiral@nsf.gov)**
- **Stephanie Smith (stesmith@nsf.gov)**