Know Your Funder: NSF

- The NSF Landscape
- The NSF Grant Development Process: From Idea to Award
- How to Survive the Process and Improve
- Questions and Discussion

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NSF Overview: Mission

The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 **"to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense…"** With an annual budget of $7.3 billion (FY 2015), NSF funds approximately 24% of all federally supported basic research conducted by America's colleges and universities.

NSF's goals—**discovery, learning, research infrastructure and stewardship**—provide an integrated strategy to **advance the frontiers of knowledge**, cultivate a world-class, broadly **inclusive science and engineering workforce** and **expand the scientific literacy** of all citizens, **build the nation's research capability** through investments in advanced instrumentation and facilities, and **support excellence in science and engineering research and education** through a capable and responsive organization.

"NSF is where discoveries begin."

NSF Overview: Grant mechanisms.

Dear Colleague Letter

- Provides general information to the community, including upcoming programs or changes.

Program Description

- Broad descriptions of programs and activities in NSF Directorates and Divisions.
- Encourage submission of proposals in areas of interest to NSF.

Program Announcement

- Formal publication announcing an NSF program.
- More detailed than a Program Description.

Program Solicitation

- Formal publication soliciting proposals in specific program areas of interest to NSF.
- More focused than a program announcement.
- Normally applies for a limited period of time.
- Competition among proposals is more precisely defined.
- Proposals compete directly with each other for NSF funding.

NSF Overview: Review process.

NSF Overview: Review criteria.

NSF evaluates proposals using two criteria:

Intellectual Merit encompasses the potential to **advance knowledge**.

Broader Impacts encompass the potential to **benefit society** and contribute to the achievement of **specific, desired societal outcomes**, including:

- Increased **economic competitiveness**
- Development of a **globally competitive work force** in science, technology, engineering, and mathematics
- Increased participation of **women** and members of **underrepresented minority groups** in these fields
- Improved **education** and teacher development in these fields in **elementary and secondary schools**
- Improved **undergraduate education** in these fields
- Increased **partnerships** between academe and industry
- Increased public **scientific literacy**
- Increased **national security**

NSF Overview: Review questions.

In evaluating proposals, NSF considers the following questions:

1. What is the potential for the proposed activity to:

    a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and

    b. Benefit society or advance desired societal outcomes (Broader Impacts)?

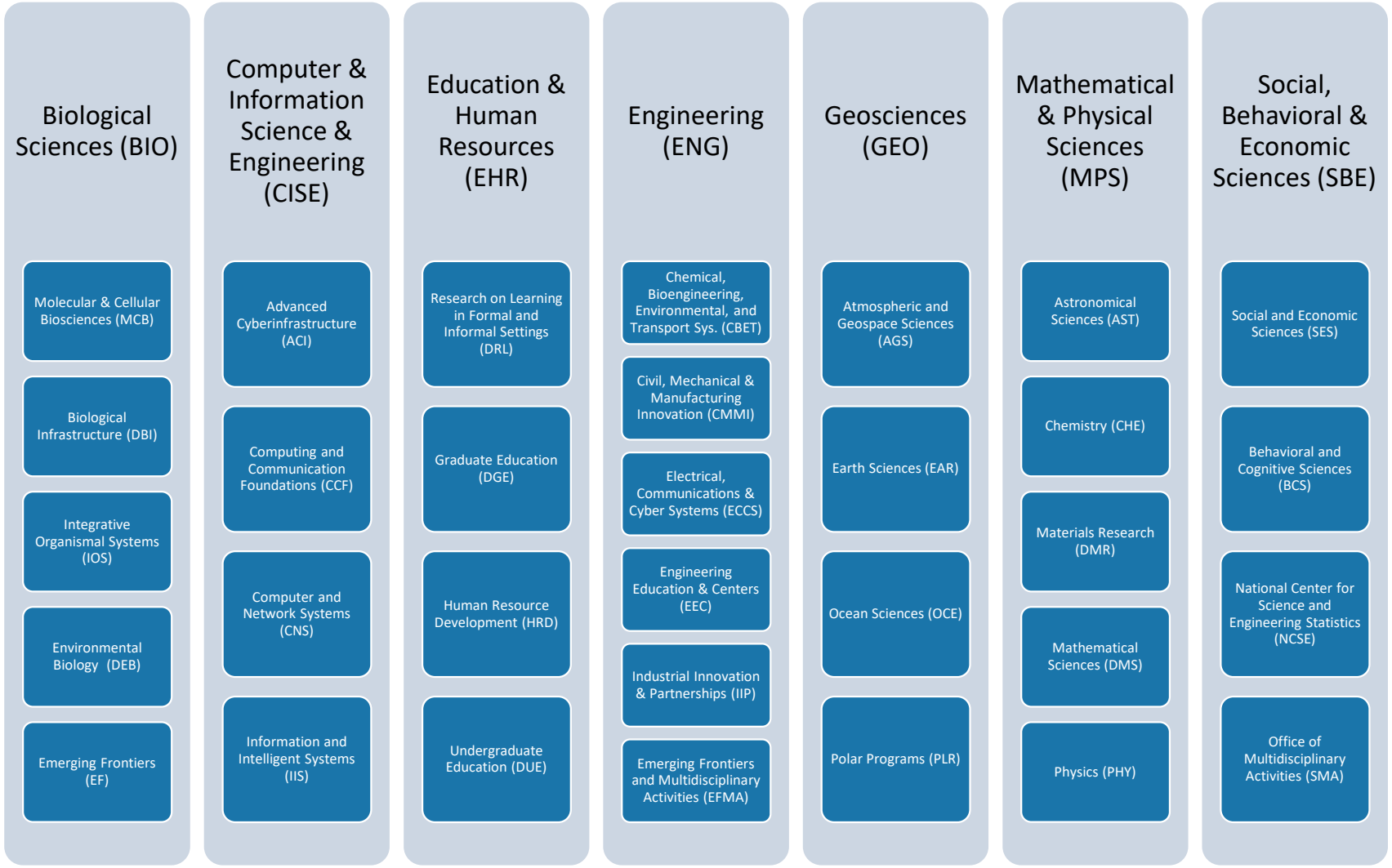
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?

4. How well qualified is the individual, team, or organization to conduct the proposed activities?

5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

NSF Overview: Grantmaking directorates.



NSF Overview: Crosscutting and NSF-wide programs.

Crosscutting programs are sponsored by more than one NSF organization, or by an NSF organization and another agency.

Example:

- Plant-Biotic Interactions (**PBI**): A partnership between NSF IOS and USDA NIFA.

NSF-wide programs are activities in which all NSF directorates participate.

Examples:

- **ADVANCE:** Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers
- Faculty Early Career Development Program (**CAREER**)
- Experimental Program to Stimulate Competitive Research (**EPSCoR**)
- Innovation Corps (**I-Corps**)
- Major Research Instrumentation Program (**MRI**)
- National Science Foundation Research Traineeship Program (**NRT**)

NSF Opportunities: Biological Sciences (BIO).

- Biological Sciences (BIO)
  - Emerging Frontiers (EF)
  - Biological Infrastructure (DBI)
  - Environmental Biology (DEB)
  - Integrative Organismal Systems (IOS)
  - Molecular and Cellular Biosciences (MCB)

NSF Opportunities: Biological Infrastructure (DBI).

DBI empowers biological discovery by supporting the development and enhancement of biological resources, human capital, and centers.

Human Resources Cluster

- Postdoctoral Research Fellowships in Biology
- Research Coordination Networks
- Research Experiences for Undergraduates (REU) (NSF Wide)

Research Resources Cluster

- Advances in Biological Informatics (ABI)
- Advancing Digitization of Biodiversity Collections (ADBC)
- Collections in Support of Biological Research (CSBR)
- Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories (FSML)
- Instrument Development for Biological Research (IDBR)

NSF Opportunities: Environmental Biology (DEB).

DEB supports fundamental research on populations, species, communities, and ecosystems.

Ecosystem Science Cluster

- Ecosystem Studies Program

Evolutionary Processes Cluster

- Evolutionary Genetics Program
- Evolutionary Ecology Program

Population and Community Ecology Cluster

- Population and Community Ecology Program

Systematics and Biodiversity Science Cluster (SBS)

- Biodiversity: Discovery & Analysis Program
- Phylogenetic Systematics Program

NSF Opportunities: Integrative Organismal Systems (IOS).

IOS supports research aimed at improving our understanding of organisms as integrated units of biological organization.

Developmental Systems Cluster

- Plant, Fungal and Microbial Developmental Mechanisms Program
- Animal Developmental Mechanisms Program
- Evolution of Developmental Mechanisms Program

Physiological and Structural Systems Cluster (PSS)

- Symbiosis, Defense and Self-recognition Program (SDS)
- Physiological Mechanisms and Biomechanics Program (PMB)
- Integrative Ecological Physiology Program (IEP)

Plant-Biotic Interactions Program

Plant Genome Research Program (PGRP)

Behavioral Systems Cluster

- Animal Behavior Program

Neural Systems Cluster

- Organization Program
- Activation Program
- Modulation Program

NSF Opportunities: Molecular & Cellular Biosciences (MCB).

MCB supports fundamental research and related activities designed to promote understanding of complex living systems at the molecular, subcellular, and cellular levels.

Cellular Dynamics and Function Cluster

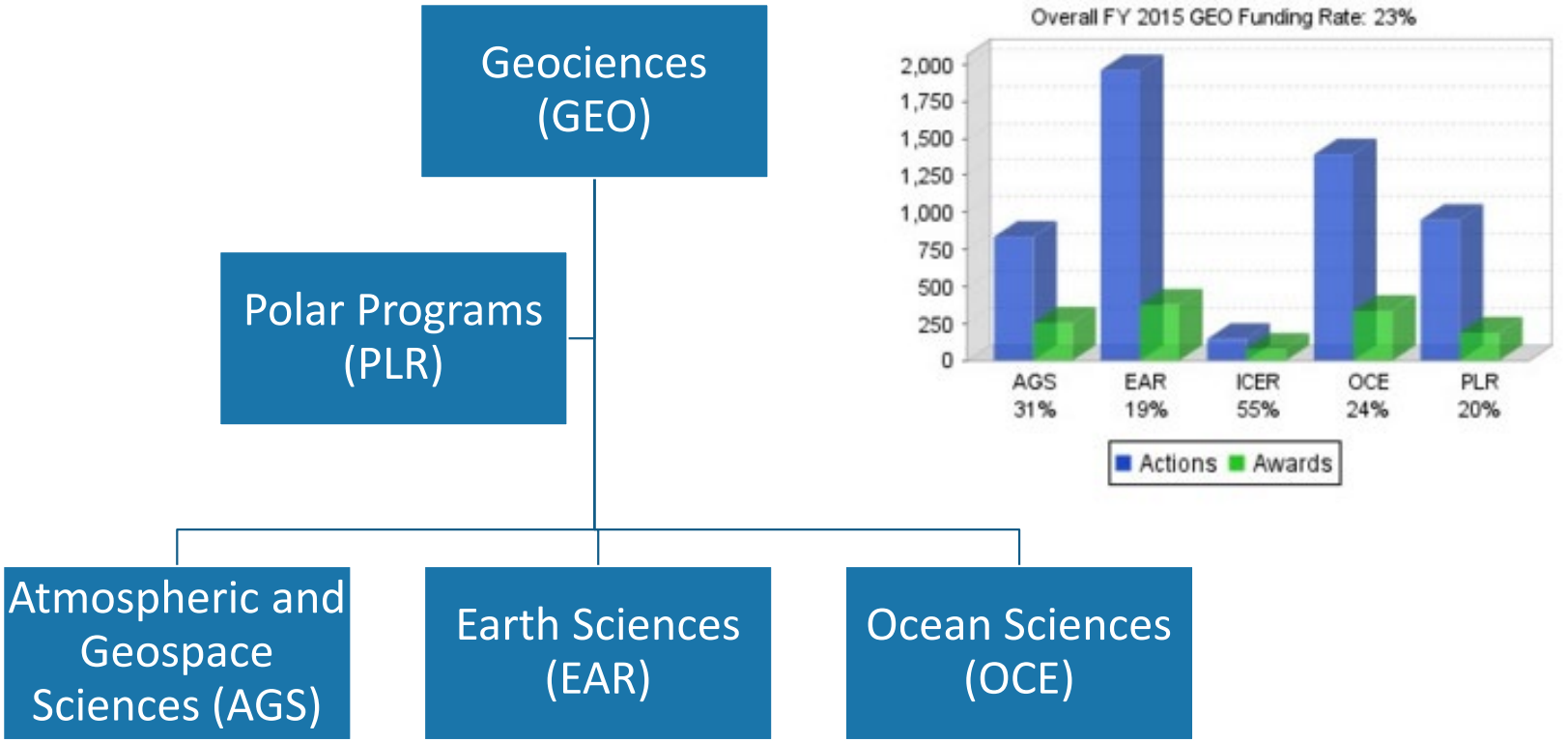
Genetic Mechanisms Cluster

Molecular Biophysics Cluster

Systems and Synthetic Biology Cluster

Note that MCB clusters are not divided into programs.

NSF Opportunities: Geosciences (GEO).



NSF Opportunities: Earth Sciences (EAR).

EAR supports proposals for research geared toward improving the understanding of the structure, composition, and evolution of the Earth, the life it supports, and the processes that govern the formation and behavior of the Earth's materials.

Deep Earth Processes Section (DEP)

- Earth Sciences: Instrumentation and Facilities (EAR/IF)
- EarthScope
- Geophysics (PH)
- Petrology and Geochemistry (CH)
- Tectonics

Surface Earth Processes Section (SEP)

- EAR Education and Human Resources (EH) Crosscutting
- Geobiology and Low-Temperature Geochemistry
- Geomorphology and Land Use Dynamics
- Hydrologic Sciences
- Sedimentary Geology and Paleobiology (SGP)

NSF Opportunities: Crosscutting & NSF-wide programs.

Special opportunities

- Rapid Response Research (**RAPID**)
- EArly-concept Grants for Exploratory Research (**EAGER**)

Broadening participation opportunities

- **ADVANCE:** Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers
- Advancing Informal STEM Learning (**AISL**)
- *Supplement:* Research Assistantships for High School Students (**RAHSS**)
- Research Experience for Teachers (**RET**)

Key NSF-wide programs

- Faculty Early Career Development Program (**CAREER**)
- Major Research Instrumentation Program (**MRI**)

NSF-Wide Opportunities: RAPID.

*RAPID funds projects with "**severe urgency** with regard to availability of, or access to, data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events."*

Key considerations for RAPID

- Program Officer contact required before submission
- Internal merit review only
- Project Description limited to 5 pages
- Up to $200,000
- Up to one year duration

NSF-Wide Opportunities: EAGER.

*EAGER funds "exploratory work in its early stages on **untested, but potentially transformative**, research ideas or approaches. This work may be considered especially 'high risk-high payoff' in the sense that it, for example, involves radically different approaches, applies new expertise, or engages novel disciplinary or interdisciplinary perspectives."*

Key considerations for EAGER

- Program Officer contact required before submission
- Internal merit review only
- Project Description limited to 8 pages
- Up to $300,000
- Up to two years duration

NSF-Wide Opportunities: ADVANCE.

ADVANCE funds efforts to increase gender equity in the academic STEM disciplines.

ADVANCE projects are funded in three tracks

1. Institutional Transformation (IT): produce large-scale comprehensive change, research on gender equity and institutional transformation for academic STEM.
2. Institutional Transformation Catalyst (IT Catalyst): conduct self-assessment or implement unique strategies.
3. Partnerships for Learning and Adaptation Networks (PLAN): provide a larger scale environment for adapting, implementing and creating knowledge about the effectiveness of a particular strategy for change.

Key considerations for ADVANCE

- ADVANCE projects are viewed as team research; the team of principal investigators is expected to be multidisciplinary and representative of the theoretical, methodological and contextual expertise necessary to conceptualize, implement, and evaluate a successful project.
- ADVANCE does not support activities to increase or retain the number of women entering into or persisting in STEM undergraduate or doctoral degree programs; rather the program focuses on ensuring that women faculty consider academia as a viable and attractive career option.

NSF-Wide Opportunities: AISL.

AISL seeks to "advance new approaches to and evidence-based understanding of the design and development of STEM learning opportunities for the public in informal environments; provide multiple pathways for broadening access to and engagement in STEM learning experiences; and advance innovative research on and assessment of STEM learning in informal environments."

Key considerations for AISL

- Project types: (1) Collaborative Planning, (2) Exploratory Pathways, (3) Research in Service to Practice, (4) Innovations in Development, (5) Broad Implementation, (6) Conferences, and (7) Informal STEM Learning Resource Center (FY 2016 only).
- Projects can address public or professional audiences.
- Priorities: knowledge-building, innovation, strategic impact, and collaboration.
- Projects must include an educational research component.
- Funding amounts and durations vary by project type.

NSF BIO Opportunities: RAHSS.

Research Assistantships for High School Students (RAHSS) offers BIO applicants an opportunity to include in their projects "strategies to successfully broaden participation during pre-college years [and] help ensure a diverse pool of future students, faculty and researchers."

As a part of a new or renewal NSF proposal or as a supplemental funding request to an existing NSF Award, BIO will consider requests that:

- Foster interest in the pursuit of studies in the Biological Sciences; and
- Broaden participation of high school students, particularly those who are underrepresented minorities, persons with disabilities, and women in sub-disciplines where they are underrepresented.

Key considerations for RAHSS

- Budgets for RAHSS activities are generally under $6,000 per student.
- RAHSS should include meaningful and challenging activities, as well as mentoring.

NSF BIO Opportunities: RET.

Research Experience for Teachers (RET)offers BIO applicants an opportunity to "enhance the professional development of K-12 science educators through research experience at the emerging frontiers of science in order to bring new knowledge into the classroom."

Key considerations for RET

- Budgets for RET activities are generally under $15,000 per teacher.
- Normally funds may be available for up to two teachers, but exceptions will be considered.
- Participation of science educators who are members of underrepresented groups (underrepresented minorities and persons with disabilities) is strongly encouraged.
- BIO is particularly interested in encouraging its researchers to build mutually rewarding partnerships with teachers at urban or rural schools and those at less well-endowed school districts.

NSF CAREER: Overview.

With CAREER, NSF aims to:

1. Support junior faculty who exemplify the role of teacher-scholars through:
    a. Outstanding research
    b. Excellent education
    c. Integration of education and research
2. Build a firm foundation for a lifetime of leadership in integrating education and research.

The Presidential Early Career Awards for Scientists and Engineers (PECASE) are awarded from among the most meritorious recent CAREER awardees based on the following criteria:

1. Innovative research at the frontiers of science and technology, relevant to the mission of NSF.
2. Community service demonstrated through scientific leadership, education or community outreach.

NSF CAREER: Eligibility.

By the Directorate's deadline for submission of CAREER proposals (July 20, 21, or 22, 2016), proposers must meet all of the following eligibility requirements:

- Hold a doctoral degree by the deadline date in a field supported by NSF;
- Be untenured until October 1 following the deadline; and
- Have not previously received a CAREER award.

AND

- By October 1st following the deadline: Be employed in a tenure-track (or tenure-track-equivalent) position as an assistant professor (or equivalent title) at an accredited institution located in the U.S., its territories, or possessions, or the Commonwealth of Puerto Rico, that awards degrees in a field supported by NSF, or a non-profit, non-degree-granting organization such as a museum, observatory, or research lab.

NSF CAREER: Key elements.

NSF states:

This premier program emphasizes the importance the Foundation places on the early development of academic careers dedicated to stimulating the discovery process in which the excitement of research is enhanced by inspired teaching and enthusiastic learning. Effective integration of research and education generates a synergy in which the process of discovery stimulates learning, and assures that the findings and methods of research and education are quickly and effectively communicated in a broader context and to a larger audience….Successful Principal Investigators will propose creative, integrative and effective research and education plans, developed within the context of the mission, goals, and resources of their organizations, while building a firm foundation for a lifetime of contributions to research, education and their integration.

Key takeaways:

- CAREER proposals focus on the PI.
- CAREER requires true integration of research and education; the education element must be well thought out, robust, and well integrated with the research plan.
- The education plan must have its own intellectual merit: It should improve STEM education in the discipline, and be novel, well researched, and evidence-based.

KEYS TO A COMPETITIVE CAREER:

INDEPENDENCE FROM MENTOR'S WORK

POTENTIALLY TRANSFORMATIVE WORK IN RESEARCH AND EDUCATION

STRONG BROADER IMPACTS INTEGRATED WITH INSTITUTIONAL MISSION

NSF MRI: Overview.

With MRI, NSF aims to:

1. Increase access to shared scientific and engineering instruments for research and research training in our Nation's institutions of higher education, not-for-profit museums, science centers and scientific/engineering research organizations.
2. Provide organizations with opportunities to acquire major instrumentation that supports the research and research training goals of the organization and that may be used by other researchers regionally or nationally.

MRI awards grants for:

1. Acquisition (Track 1) of a shared-use instrument: *An MRI acquisition proposal is characterized by a demonstrated need for the purchase or upgrade of a generally available, yet sophisticated, instrument with little or no modification.*
2. Development (Track 2) of a shared-use instrument: *A development proposal should include a demonstration of the need for a new or extensively upgraded instrument that can provide enhanced or potentially transformative use and performance, open up new areas of research and research training, and/or have potential as a commercial product.*

NSF MRI: Requirements.

MRI assists with the acquisition or development of a shared research instrument that is too costly and/or not appropriate for support through other NSF programs.

Key considerations

- No support for research
- No ongoing support for operating or maintaining facilities
- Instrument should be operational for regular research use by the end of the award period
- Must be a single well-integrated instrument, rather than a suite of instruments (must not be able to conduct independent research activities simultaneously)
- Awards usually $100,000–$4 million (costs must be reasonable)
- Cost-sharing of precisely 30% of the total project cost required for Ph.D.-granting institutions

NSF MRI: Key elements.

When considering MRI proposals, NSF evaluates the project's impact as well as the institution's preparation for and commitment to the project.

Impact

- Diversity and quality of research to be enabled
- Instrument's specific role in the research
- Impact on the institution
- Impact on the region
- Broadening participation

Preparation and Commitment

- Institutional commitment
- Detailed management plans

KEYS TO A COMPETITIVE MRI:

CLEAR DETAIL ON HOW THE INSTRUMENT ENABLES THE RESEARCH

STRONG INSTITUTIONAL AND RESEARCH IMPACT

EVIDENCE THAT THE INSTITUTION IS PREPARED AND COMMITTED

Know Your Funder: NSF

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- The NSF Grant Development Process: From Idea to Award
- How to Survive the Process and Improve
- Questions and Discussion

Lay the Groundwork: Know your field.

How does your work relate to other work in the field?

The answer to this question should guide the grantseeking process.

Ask yourself:

- What gap in knowledge or services will this work fill?
- Does this work build on previous work? Which work?
- Does this work solve a fundamental challenge facing the field?
- Does this work duplicate other work?
- How does this work relate to other work currently in process?
- How will this work contribute to the field in the short and long term?
- Is this work a priority for the field?

Lay the Groundwork: Develop a project.

1. Develop a concept.

- Define goals, objectives, and activities.
- A high-level logic model may be helpful at this stage. (Note that we will cover logic models later in this presentation.)
- Articulate the concept in a short concept paper.

2. Get feedback from mentors and colleagues.

- Ask: What would strengthen this project?
- Do not skip this step!

3. Refine your project concept based on the feedback you receive.

Lay the Groundwork: Where does the project fit?

1. Identify potential NSF Directorates, Divisions, Clusters, and Programs.

- Review each website, noting current funding opportunities and stated priorities.
- Prioritize opportunities based on fit.

2. Review previously funded projects for priority programs.

- Note key awards.
- Identify trends.

3. Identify Program Officers / contacts for priority programs.

- Look into each PO's background and interests.
- Note relevant interests or potential connections.

Lay the Groundwork: Contact Program Officers.

Discuss your work with identified Program Officers.

For most NSF opportunities, it is not worth applying for a grant without first contacting a Program Officer to discuss your proposal.

Email your concept paper to the Program Officer, and ask:

- Is your division/program currently interested in this type of work?
- If so, do you have any guidance on how best to approach a proposal?

Key points:

- If a Program Officer prefers to speak on the phone, *speak to them on the phone.*
- Take Program Officer guidance seriously: they are in the best position to know what will be competitive.

Program Officers are there to help you.

Exercise: Selling your project to NSF.

1. Take a moment to think of a potential project concept that you might "shop" to NSF.

2. Find a partner and each take 3-5 minutes to summarize your project in terms of NSF's review criteria. How will it advance knowledge and benefit society?

3. Share feedback with the group. What was challenging? What was interesting?

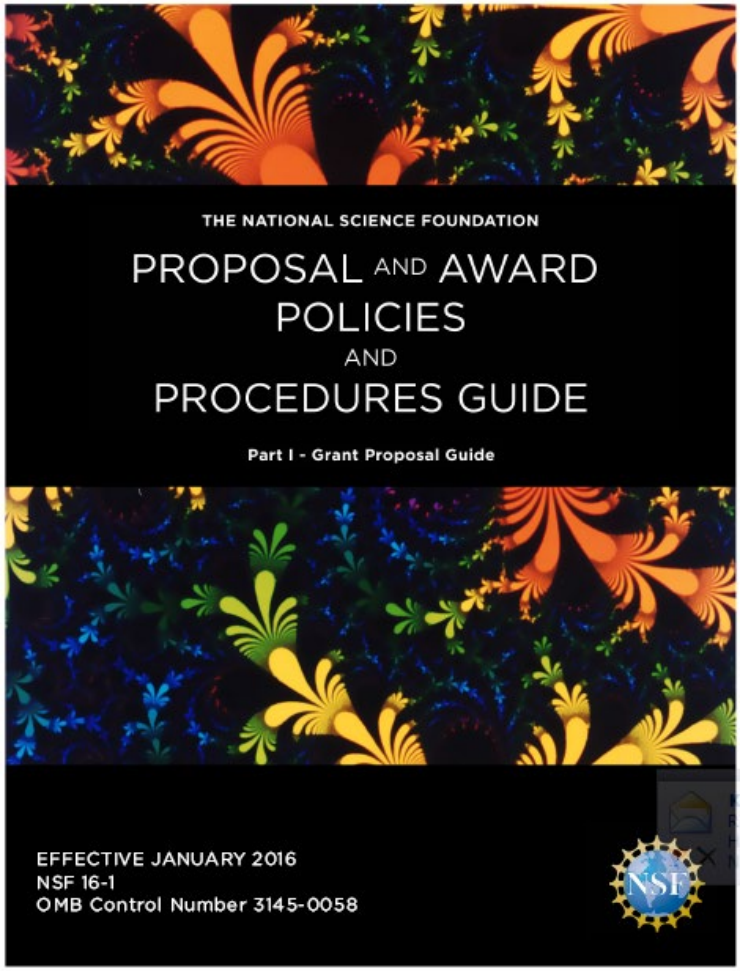
NSF Review Criteria

Intellectual Merit — the potential to **advance knowledge**.

Broader Impacts — the potential to **benefit society** and contribute to the achievement of **specific, desired societal outcomes**, including:

- Increased **economic competitiveness**
- Development of a **globally competitive work force** in science, technology, engineering, and mathematics
- Increased participation of **women** and members of **underrepresented minority groups** in these fields
- Improved **education** and teacher development in these fields in **elementary and secondary schools**
- Improved **undergraduate education** in these fields
- Increased **partnerships** between academe and industry
- Increased public **scientific literacy**
- Increased **national security**

Build a Competitive Proposal: Know the rules.



The Grant Proposal Guide (GPG) is the applicant's best friend (or worst enemy).

Part of the *Proposal and Award Policies and Procedures Guide* (PAPPG), the GPG contains application guidelines, from font sizes to information requested.

The PAPPG also contains post-award information.

Investigators are responsible for knowing the contents of the PAPPG.

Note that not all important information is contained in NSF Program Solicitations.

When in doubt, consult the GPG.

Build a Competitive Proposal: Understand NSF solicitations.

Anatomy of an NSF Solicitation

Important Information and Revision Notes

Summary of Program Requirements

I. Introduction

II. Program Description

III. Award Information

IV. Eligibility Information

V. Proposal Preparation and Submission Instructions

VI. NSF Proposal Processing And Review Procedures

VII. Award Administration Information

VIII. Agency Contacts

IX. Other Information

Note that not all opportunities have a formal solicitation—sometimes they just say "use the GPG."

Build a Competitive Proposal: Basic elements.

A. Cover Sheet
B. Table of Contents
C. Project Summary
D. Project Description
E. References Cited
F. Biographical Sketch(es)
G. Budget and Budget Justification
H. Current and Pending Support
I. Facilities, Equipment and Other Resources
J. Special Information and Supplementary Documentation, as applicable (e.g., Data Management Plan, CAREER Departmental Letter)

Build a Competitive Proposal: Make a plan.

Map out your strategy to develop and submit the proposal on time.

Create:

- **Checklist** of all required proposal elements
- **Timeline** for proposal development, including key dates
  - Note deadline for Letter of Intent or pre-proposal, as well as full proposal deadline.
  - Allow time to get internal approval before submission (completed proposals must be submitted to the Grants Office through Cayuse **at least 7 days before the deadline**).
- **Templates** of the Project Narrative, Project Summary, and other key documents
  - Note all page limits and formatting requirements from the Solicitation and GPG.

Always allow time for derailments: plan to submit well before the deadline.

Build a Competitive Proposal: The Project Description.

The Project Description provides the following information to NSF:

- **What** the PI wants to do
- **Why** they want to do it
- How they **plan** to do it
- How they will know if they **succeed**
- What **benefits** could accrue if the project is successful

Tips for a successful Project Description:

- Provide reviewers with a clear organizational structure, including consistent headings.
- Provide clear and easy-to-read formatting, following the GPG requirements.
- Provide consistent internal references and number tables and figures sequentially.
- Remember that reviewers are very busy, and have many, many documents to read; make their lives easier.
- Provide enough detail so the reviewer knows what you want to do, but not so much that they get lost.
- Edit and proofread carefully; good writing matters to NSF.
- The structure of the Project Description is flexible, but it must contain a separate section titled "Broader Impacts of the Proposed Work."
- The Project Description is usually limited to 15 pages, of which up to 5 may describe the results of prior NSF support.

Build a Competitive Proposal: Sample PD Outline.

I. Introduction
II. Objectives
III. Rationale
    A. Review of the Literature
    B. Contribution to the Field (Intellectual Merit)
IV. Research Plan
    A. Methods
    B. Resources
    C. Project Management Plan
    D. Timeline
V. Education Plan
    A. Rationale
    B. Methods
    C. Evaluation
VI. Broader Impacts of the Proposed Work

Build a Competitive Proposal: Structure and focus.

A successful NSF grant:

- Has clear objectives, research questions and/or hypotheses. (NSF does not appreciate “fishing expeditions.”)
- Is tightly structured, with all elements supporting the project objectives.
- Clearly describes exactly what is going to be done, why, how, and by whom.
- Is directly relevant to current problems in the field.
- Is bold or transformative, yet practical.

NSF has limited funding. Make sure the project looks like a good investment.

Build a Competitive Proposal: Know your audience.

Peer Reviewers and **NSF Program Officers** are the primary audience for NSF grant proposals.

- PIs can expect these individuals to be broadly familiar with the scientific field.
- PIs should not assume, however, that readers will be familiar with the details of the field in question. All terms should be defined, and all work should be placed in scientific context.

The Broader Impacts section also has a **broader audience**.

- Congress and the public make up the ultimate audience for the Broader Impacts of the Proposed Work section.
- The language in this section can be used by NSF to justify funding from Congress.
- This section should be accessible and compelling to readers from outside the scientific community.

Build a Competitive Proposal: The Project Summary.

The one-page NSF Project Summary contains three sections.

Overview: A summary of activities, objectives, and methods.

Intellectual Merit: A statement of how the project advances knowledge.

Broader Impacts: A statement of how the project benefits society and contributes to NSF's specific desired outcomes.

Tips for a successful Project Summary:

- Write it last, after all the details of the proposal are in place.
- Write it in the third person (though the Project Description is usually written in the first person).
- The three sections may not total more than 4,600 characters, including spaces.
- Normally, the Project Summary is copied and pasted into the appropriate sections in FastLane.
- If the Project Summary contains special characters (e.g., mathematical notation), it may be uploaded as a PDF Supplementary document.
- If uploaded as a PDF, the Project Summary must contain the three separate required sections with individual headers.

Build a Competitive Proposal: Budget.

Key considerations for standard NSF budget lines

A. SENIOR PERSONNEL: NSF funds no more that two person months per year (from all grants).

B. OTHER PERSONNEL: These should work directly to accomplish the objectives.

C. FRINGE BENEFITS: Use standard rate or actual costs.

D. EQUIPMENT: Defined as durable, long-lasting (more than a year), more than $5,000 each.

E. TRAVEL: Must be necessary to accomplish the objectives.

F. PARTICIPANT SUPPORT: Must be well-justified.

G. OTHER DIRECT COSTS

1. MATERIALS AND SUPPLIES: Items costing less than $5,000 Including computing devices.
2. PUBLICATION/DOCUMENTATION/DISSEMINATION: For project results.
3. CONSULTANT SERVICES: Professional services, must be able to justify rate.
4. COMPUTER SERVICES: Must be justified based on institutional rates and policies.
5. SUBAWARDS: Must include a separate budget and budget justification.
6. OTHER: Use only if necessary, provide ample detail and justification.

When in doubt, read the GPG!

Build a Competitive Proposal: Budget Justification.

The Budget Justification must be consistent with the Project Description.

Tips for Budget Justification development

- Show a clear method of calculation for each item. Be very specific!
- Demonstrate that each item is necessary to accomplish project objectives.
- Use the same terminology that you used in the Project Description.
- The Budget Justification is limited to three pages.

Budget pitfalls to avoid

- Items that are specifically disallowed by the GPG or the solicitation.
- Items that are not well justified or directly related to the project.

Make sure the reviewer sees you as a responsible steward of federal funds!

Build a Competitive Proposal: References Cited.

Provide citations for all sources used in preparing the proposal.

Key considerations for References Cited

- Follow accepted scholarly practices.
- Include citations only — this section may not be used for parenthetical information.
- Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication.
- Include URLs where available (they are not required, but they are appreciated).

Make things easy for your reviewers!

Build a Competitive Proposal: Biographical Sketches.

Biosketch structure *(see example provided)*

(a) Professional Preparation

Undergraduate Institution(s) Location Major Degree & Year

Graduate Institution(s) Location Major Degree & Year

Postdoctoral Institution(s) Location Area Inclusive Dates (years)

(b) Appointments (Reverse chronological order, beginning with the current appointment.)

(c) Products (Must be citable and accessible, and include full citation information.)

(i) Up to five products most closely related to the proposed project

(ii) Up to five other significant products.

(d) Synergistic Activities (Up to 5, demonstrate the broader impact of professional and scholarly activities).

(e) Collaborators & Other Affiliations

Key considerations for biosketches

- Provide biosketches for all senior personnel.
- Limit to two pages, and do not include personal information (e.g., home address).
- Qualifications for other personnel may be included in a separate document.

Build a Competitive Proposal: Current & Pending Support.

Current and Pending Support should include:

- All current and pending support for ongoing projects and proposals, **including this project**.
- Support from Federal, State, local or foreign government agencies, public or private foundations, industrial or other commercial organizations, or internal funds allocated toward specific projects.
- The proposed project and all other projects or activities requiring a portion of time of the PI and other senior personnel **must be included**, even if they receive no salary support from the project(s).
- Provide the total award amount for the entire award period covered (including indirect costs), and the number of person-months per year to be devoted to the project.
- If the current project has been funded previously by a source other than NSF, provide information for the last period of funding.

Show NSF that others are supporting your work, but you are not overcommitted.

Build a Competitive Proposal: Facilities & Equipment.

Facilities, Equipment, and Other Resources should include:

- Internal and external resources (both physical and personnel) that the organization and its collaborators will provide to the project, should it be funded.
- This is not official cost-sharing, though it is a commitment to provide the resources.
- Only include resources that are directly applicable to the project.
- Do not include any quantifiable financial information.

This section should demonstrate that you have the resources necessary to accomplish the project objectives.

Build a Competitive Proposal: Supplementary documents.

Only specified supplementary documents may be included.

Examples:

Postdoctoral Researcher Mentoring Plan

- Each proposal that requests funding to support postdocs must include a description of the mentoring activities that will be provided for such individuals.

Data Management Plan

- Limited to two pages, the Data Management Plan should include:
  1. The types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project.
  2. The standards to be used for data and metadata format and content.
  3. Policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements.
  4. Policies and provisions for re-use, re-distribution, and the production of derivatives.
  5. Plans for archiving data, samples, and other research products, and for preservation of access to them.

Do not include appendices unless specifically authorized, and do not use supplementary documents to circumvent page limits!

Review and Submission: Review the final package.

Before submitting the final package to the Grants Office for review:

- Review the package as a whole. Are all required elements included? Is it internally consistent?
- Review formatting: does it follow the GPG and solicitation?
- Look at the package from the perspective of a reviewer. Will s/he be able to find everything necessary to evaluate the proposal?

Avoid common pitfalls

- Make sure the Project Description contains a clear logical structure and the right level of detail.
- Make sure the scientific contribution and broader impacts are clearly articulated.
- Make sure all formatting is consistent and easy to follow.
- Make sure all budget items are directly related to objectives.

Clarity, precision, and consistency are important to NSF!

Know Your Funder: NSF

- The NSF Landscape
- The NSF Grant Development Process: From Idea to Award
- How to Survive the Process and Improve
- Questions and Discussion

Survive and Improve: Perspective.

Grantseeking is a competitive, iterative process.

- Many grants aren't funded on the first submission.
  - For some opportunities, the expectation of resubmission is built in.
- Remember: a grant decline is not a reflection of the value of your work.
- Learn as much as you can from each grantseeking process.

Survive and Improve: Practical tips.

To survive and thrive in the NSF grant process:

- Start early.
- Keep checklists and refer to them often.
- Stay connected with the Grants Office.
- Stay connected with Program Officers.
- Get outside feedback from peers and professionals.
- Remember: your skills and savvy will improve with each grant.

Survive and Improve: Learn from reviewer comments.

Reviewer comments are extremely valuable.

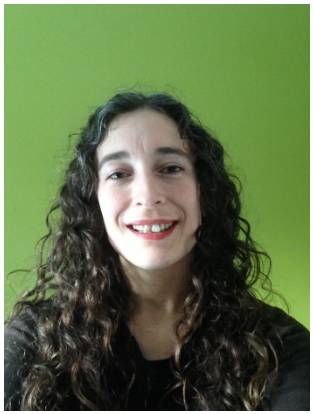
- Review comments show how your proposal came across.
- Read them multiple times.
- Give yourself a break to blow off steam if necessary, then come back.
- Look critically at the proposal from the perspective of that reviewer.
- If there is a misunderstanding, consider how it could be avoided in the future.
- Are there structural or language changes that would help reviewers understand your project?
- If all your reviewers point to the same issues, pay attention!

The best way to understand reviewers, review comments, and the review process, is to serve as a reviewer yourself.

QUESTIONS?

Rebecca Huenink

Grants Consultant



Rebecca has more than a dozen years of experience successfully guiding grantseekers through the funding process, from concept design and development to grant award and stewardship. Over the course of her grant development career, Rebecca has raised nearly $25 million to support research and programs at universities, hospitals, municipalities, and nonprofit organizations nationwide. She is especially experienced with NSF, HHS, ED, DOJ, HUD, and private foundation grants. Rebecca enjoys helping institutions and individuals strategically build and cultivate fruitful relationships with funders. She also enjoys teaching the finer points of grant development, from writing style to pre-proposal networking, to position applicants for long-term funding success.

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