

Submitting Proposals to the National Science Foundation (NSF)



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Match your research to funding source.



BILL & MELINDA
GATES foundation

THE MCKNIGHT FOUNDATION



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



What is the National Science Foundation?

- Independent Federal Executive Branch agency
- Established in 1950
- Mission: **Advance the progress of science, to advance national health, prosperity and welfare, and secure the national defense.**
- FY2019 funding: \$8.1 billion
- Funds basic science (and maintains some specific research facilities)
- All fields of (non-medical) basic science and engineering: Math and Physical Science, Biological Science, Engineering, Computer and Information Science and Engineering, Geoscience, Social, Behavioral and Economic Science, Education and Human Resources.




NSF funds basic science research.


Basic scientific research is grounded in a broader theoretical framework.



It focuses on one or a few research questions grounded in that broader framework.

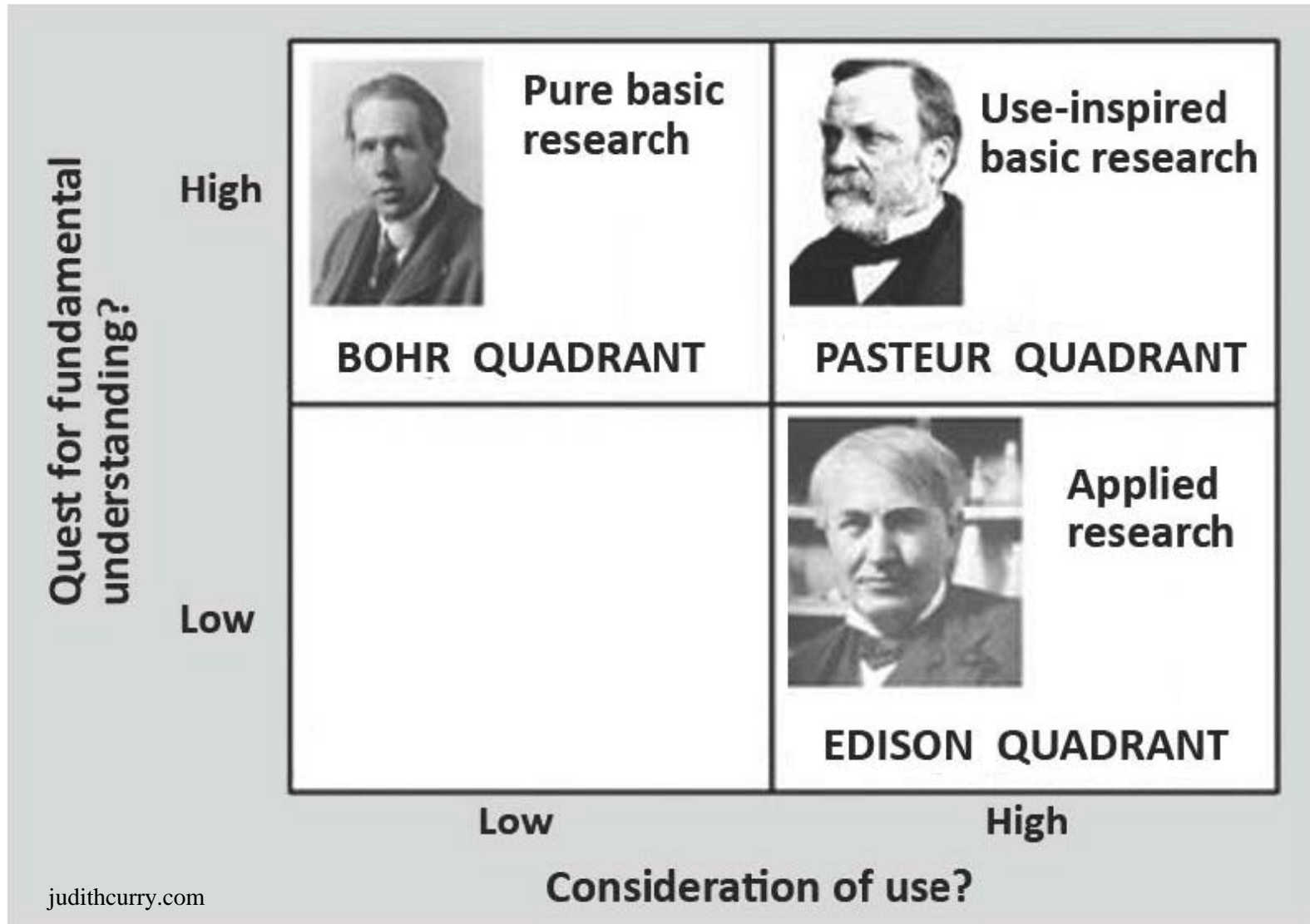


It uses scientifically sound approaches to assess the viability of answers to those questions.



Its focused results contribute to enhancement of broader theoretical knowledge.

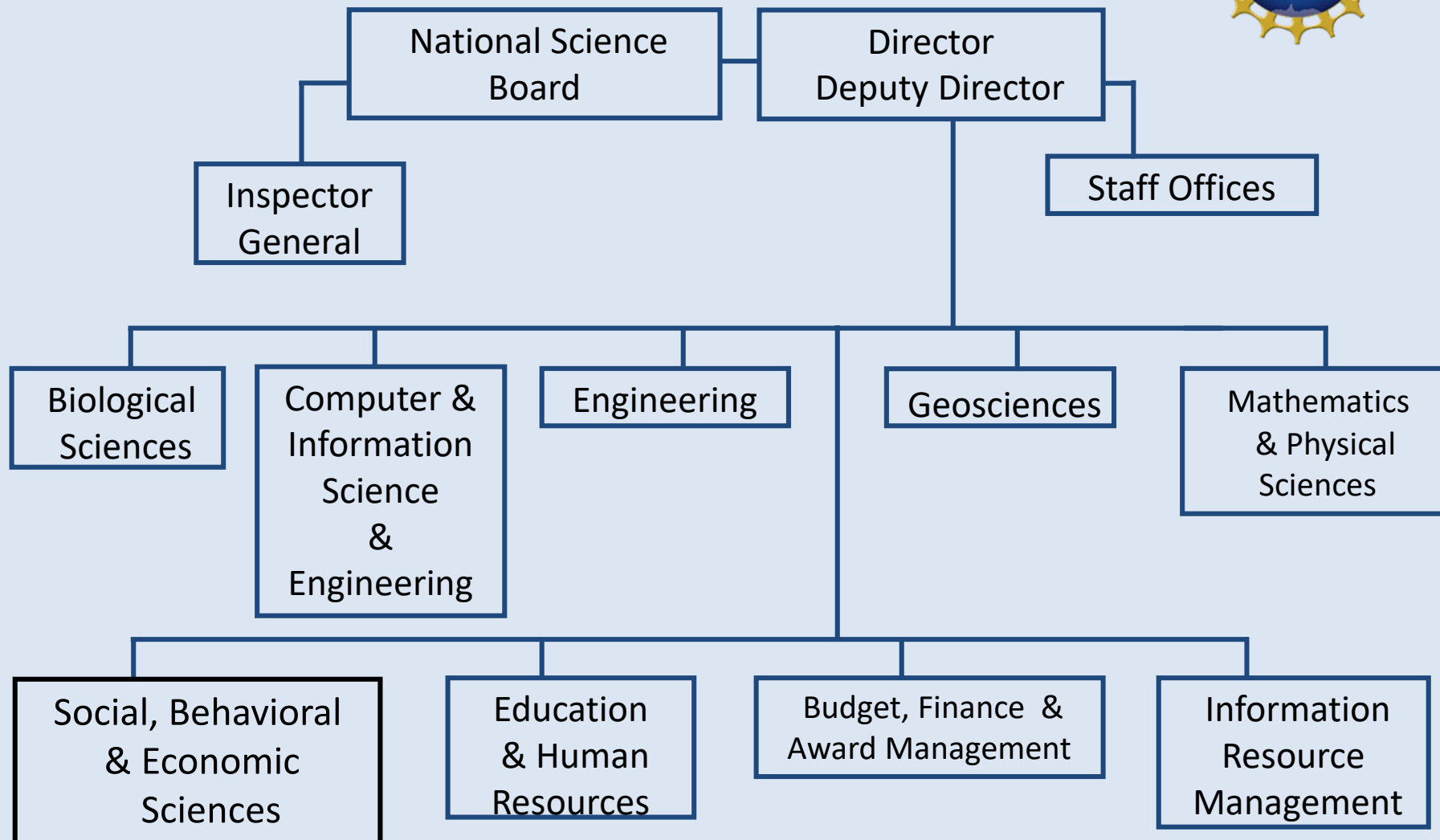
NSF is moving more towards use-inspired research.



What does NSF (not) do?

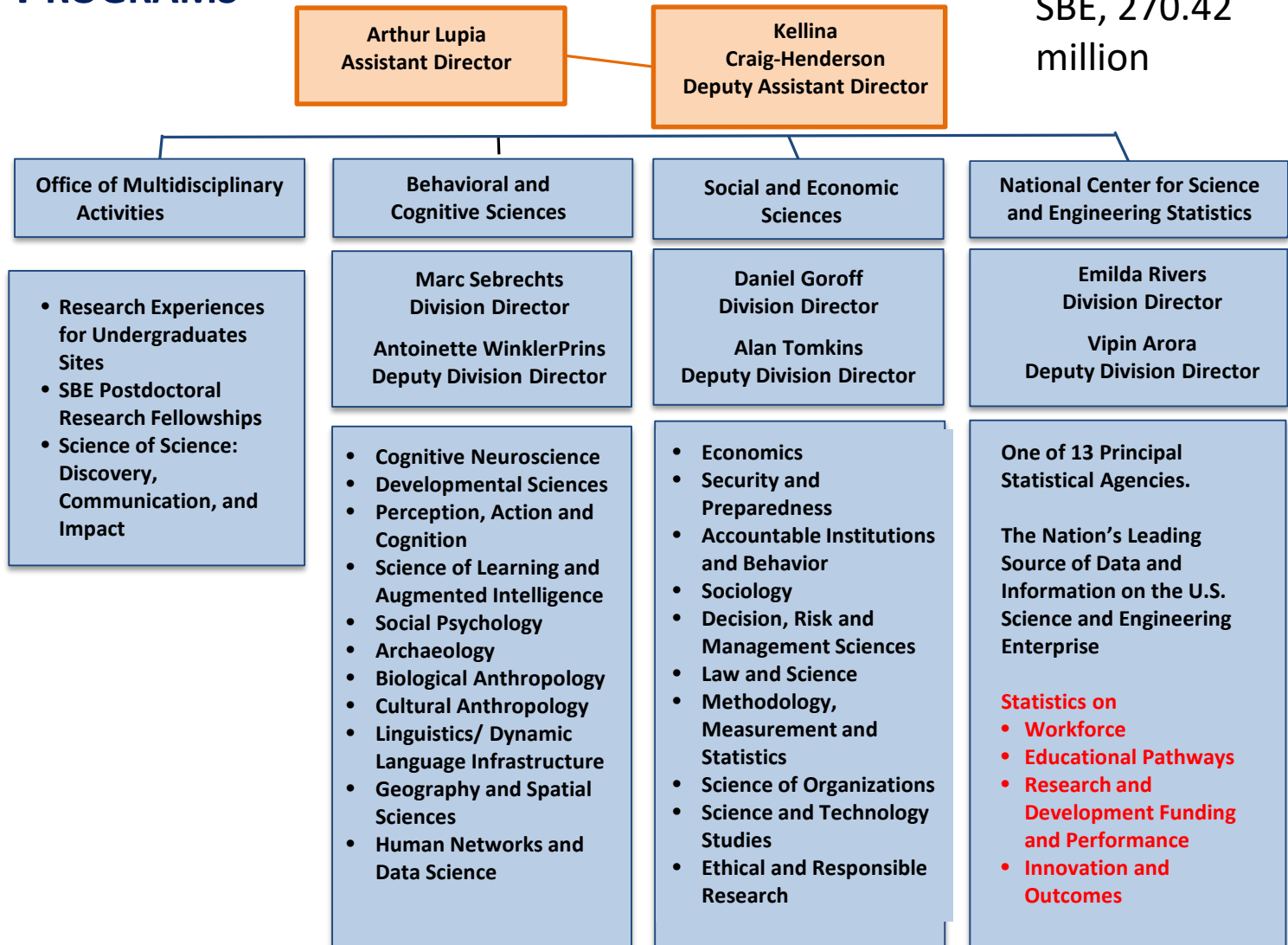
- It does:
 - Announce funding opportunities
 - Program Descriptions
 - Solicitations
 - Dear Colleague Letters
 - Receive and review research proposals
 - Fund transformative basic research
 - Manage awards
 - Provide data on science and engineering
- It does *not*:
 - Set policy (except for its own operations)
 - Have in-house labs
 - Advise other federal agencies on science.
 - Lobby Congress for more research funding.

The NSF is organized into 7 directorates.



SBE ORGANIZATIONAL CHART AND PROGRAMS

FY19 budget for SBE, 270.42 million





NCSES is ... A division in the National Science Foundation's
SBE Directorate

One of 13 principal statistical agencies:





NCSES, What we do...

- NCSES is the world's premier source for information on:
 - Research and Development
 - The science and engineering workforce
 - U.S. competitiveness in science, engineering, technology, and R&D
 - The condition and progress of STEM education in the United States



Tools and Resources

- As part of our mandate to provide information useful to practitioners, researchers, policymakers, and the public, NCSES prepares about 30 reports a year.
- Two of these reports are Congressionally mandated:
 - [Science and Engineering Indicators](#) for the National Science Board
 - [Women, Minorities, and Persons with Disabilities in Science and Engineering](#)
- NCSES also makes data available to the public through data tools and other resources
 - [Formal Reports](#)
 - [Data and Tools](#)
- NCSES has launched a new [interactive tool](#) for exploring data related to science and engineering in the United States.



What **types** of grants are available?

For faculty

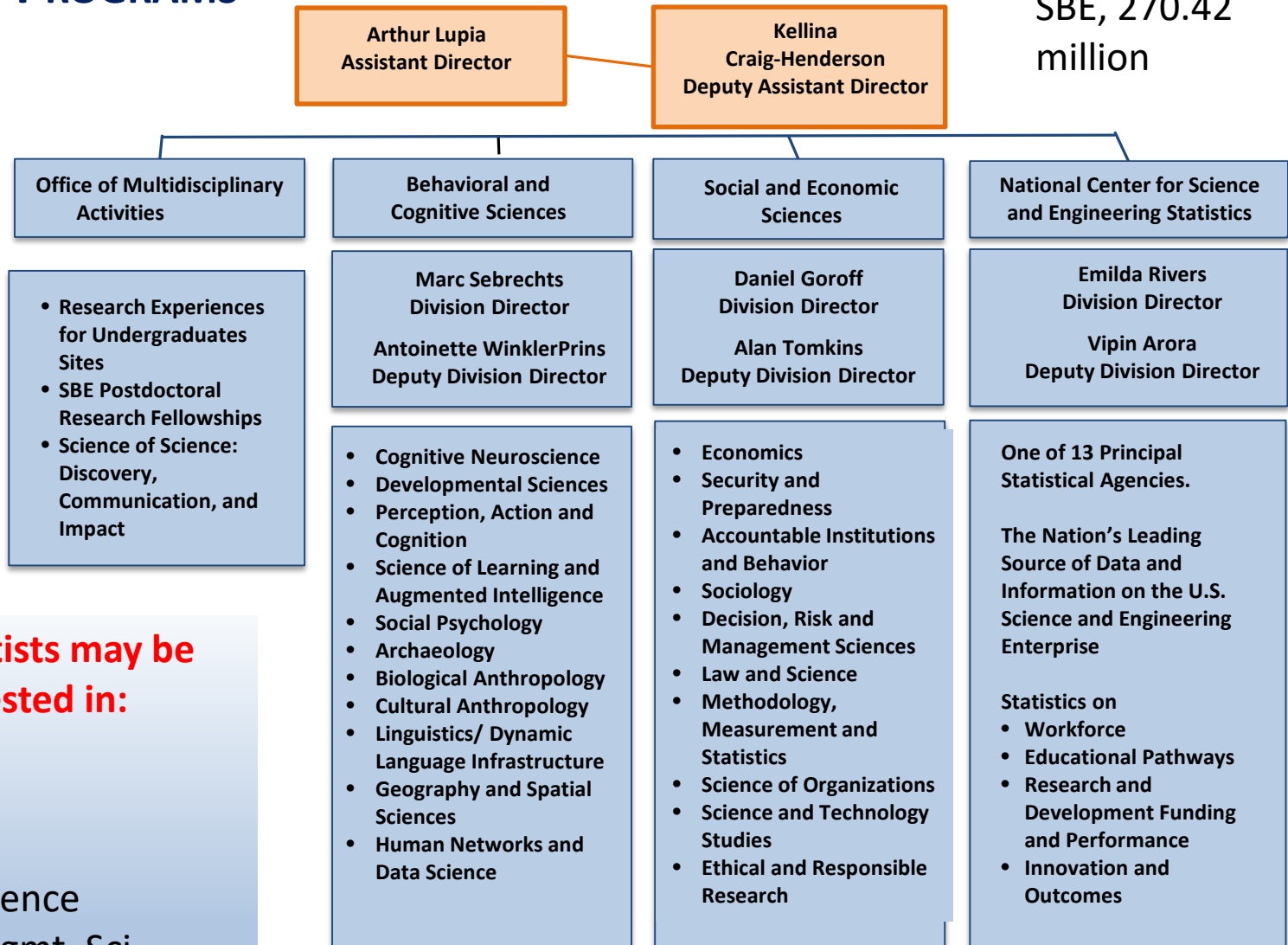
- Core program research grants
- CAREER grants
- Research Coordination Network (RCN) grants
- Interdisciplinary research grants
- Research Networks/ Centers
- Infrastructure grants

For students/ post-docs

- Graduate Research Fellowship Program (GRFP)
- REU/REG supplements
- Grad assistant on faculty research grant
- Doctoral Dissertation Research Improvement Grants (DDRIG)
- Post-doctoral fellowships

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ACSP scientists may be most interested in:

- Sociology
- Economics
- Law and Science
- Dec. Risk Mgmt. Sci.
- Geog. and Spat. Sci.



Interdisciplinary Programs

[Dynamics of Integrated Socio-Environmental Systems \(CNH2\)](#)

[General page on urban systems](#)

- [Smart and Connected Cities \(SCC\)](#)
- Sustainable Urban Systems (SUS)
- Coastlines and People (CoPe)



Ten Big Ideas



Navigating the New Arctic

Build a cyber-enabled observing system to document the rapid changes throughout the Arctic region that have profound impacts on the global climate.

HARNESSING THE DATA REVOLUTION

Harnessing Data for 21st Century Science and Engineering

Generate a world-wide data-enabled future for the U.S. through fundamental research and education in data science and systems.



Work at the Human-Technology Frontier: Shaping the Future

Understand how constantly evolving technologies are actively shaping our lives and how we in turn can shape those technologies, especially in the world of work.

RESEARCH IDEAS

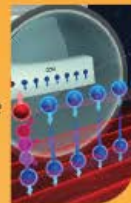


Understanding the Rules of Life: Predicting Phenotype

Bridge the biggest gap in biological science by determining how an organism's genes interacting with the environment influences its unique characteristics.

The Quantum Leap: Leading the Next Quantum Revolution

Develop ways to understand and manipulate the fundamental behavior of matter and energy to create the technologies of the future.



Windows on the Universe: The Era of Multi-messenger Astrophysics

Extend our understanding of the cosmos by using NSF's unique facilities to observe the universe in previously impossible detail.

PROCESS IDEAS



Growing Convergent Research at NSF

Integrate knowledge, tools, techniques, and modes of thinking from widely diverse fields to address pressing societal problems and profound research questions.



NSF-INCLUDES: Enhancing Science and Engineering through Diversity

Tap the innovation inherent in America's diversity to strengthen the U.S. science and engineering enterprise.



Mid-scale Research Infrastructure

Develop a nimble process to fund crucial scientific infrastructure projects that fall between traditional funding boundaries.



NSF 2050

Cultivate bold, forward-thinking research that transcends traditional approaches and pushes the frontiers of discovery and innovation for years to come.



How does NSF make decisions?

- Bottom-up researcher lead process: starts with proposals.
- Merit review process that involves the research community:
 - NSF wide policy: at least 3 written ‘external’ reviews
 - Exceptions: Workshops < \$50k, EAGER awards, RAPID awards.
 - Ad-hoc reviews: like referee’s reports.
 - Panel review: Panel meets, looks at all proposals: written individual and panel reviews and a priority recommendation.
 - YOUR involvement is what makes NSF’s work possible.
- Program directors make recommendations (about award size as well as whether or not to fund).
- Division Director reviews the recommendation and decides whether to “concur.”
- Division of Grants and Agreements considers the paperwork, does a technical review, and makes the award.



Familiarizing yourself with NSF's Review Criteria improves the competitiveness of your proposal.

- **Intellectual Merit:** The intellectual Merit criterion encompasses the potential to advance knowledge.
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.
 - This is where policy impacts are part of the evaluation.
 - Remember, NSF is not a 'mission' agency: we don't have specific targeted policy areas.



There are many parts to an NSF proposal.

- Cover sheet (listing all PIs)
- Project Summary (one page; specifically addressing Intellectual Merit & Broader Impacts)
- Table of Contents
- Project Description (regular proposals 15 pgs)*
- References cited
- Biographical Sketches (for all PIs and collaborators)*
- Collaborators and Other Affiliations *
- Budget (direct and indirect costs)
- Budget Justification
- Current & Pending Support (for all PIs)
- Facilities, Equipment, & Other Resources
- Data Management Plan
- Special Information & Supplementary Documentation*
(includes ltrs of collab.)

* Most compliance problems



In crafting your proposal, work towards a focused, clear research design.

Background and literature for theoretical background and lacuna.

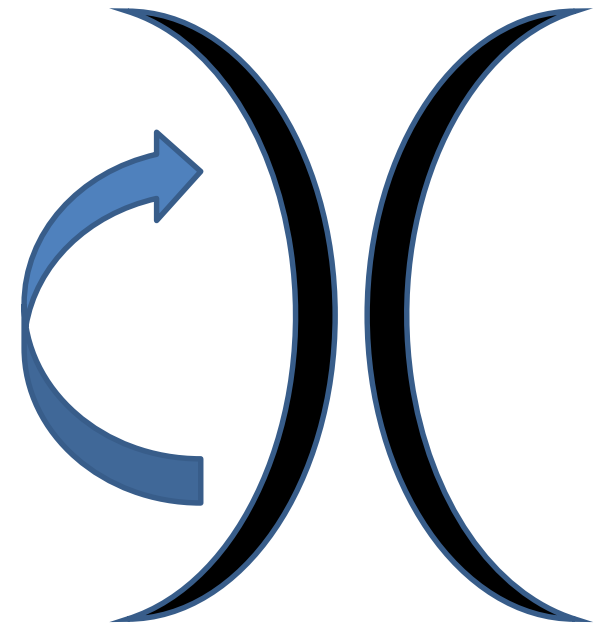
Pose research questions and/ or define hypotheses to be tested.

Select methods to answer questions or test hypotheses.

Analysis of data.

Answer the questions and/or test hypotheses.

New information and contributions to theories and literatures.





What are the ingredients of a successful proposal?

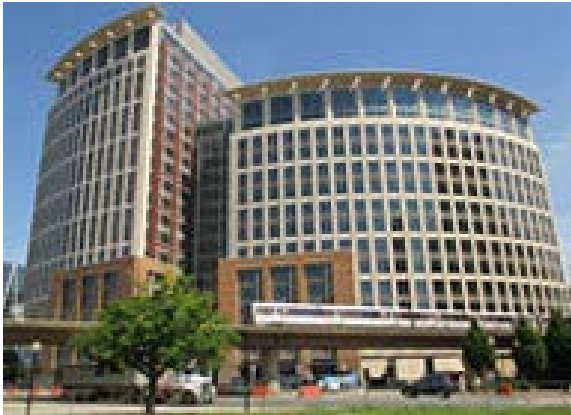
- A compelling idea that is intellectually potentially transformative and has a high potential to benefit US society.
- Clear writing and organization! Be explicit!
 - Range of reviewer types
- Attention to detail – methods, analysis. This is very important for NSF proposals.
- Writing a successful proposals is a craft, a genre, harder than manuscripts!



I have an idea, what do I do?

- Read the Proposal & Award Policies and Procedures Guide for the rules/procedures.
- Read the program solicitation or description.
- Review the Program's recent awards.
- Email the program directors a ~1 page prospectus to obtain feedback regarding fit.
- Write at the right time in the project's lifecycle.
- Professional writing ALWAYS matters.

NSF is an institution with real people who welcome inquiries and communication, ***start with email!***



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Thank you!
Any questions?
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