NSF 101

November 8, 2022

COE/COS/Khoury RD Teams for the NU community

- Mariah Nobrega, Assistant Dean for Research and Faculty Development, COE
- Andrea Stith, Director of Research Development, Khoury
- Vance Blankers, Associate Director of Research Development, COS

NORTHEASTERN

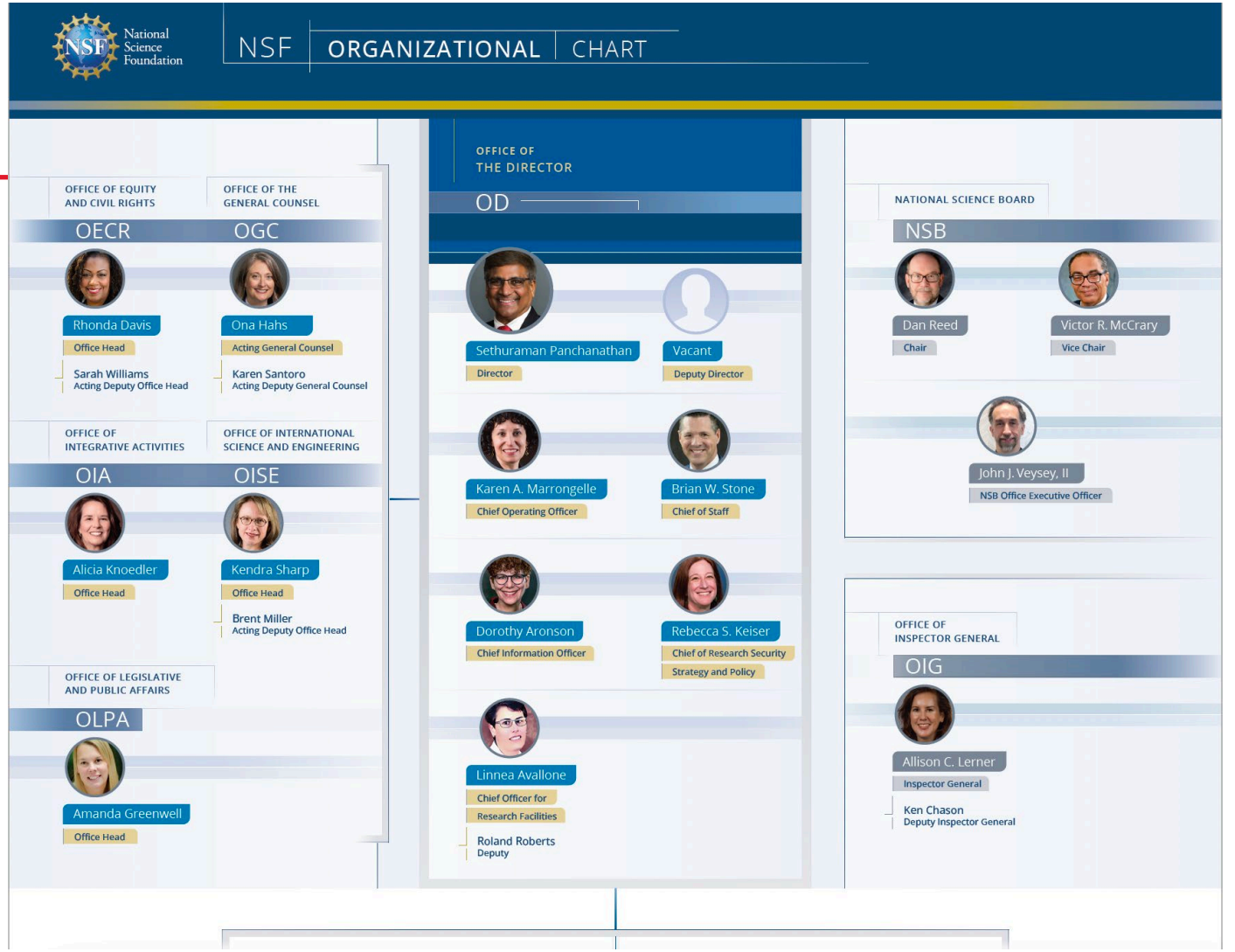
Agenda

- 20” – Overview
- 15” – Panel presentation
- 25” – Open Q&A

NSF Overview

NSF Director

Sethuraman Panchanathan



8 Science Directorates

BIO, CISE, EHR, SBE, ENG, MPS, GEO, TIP

each led by an Assistant Director and Deputy AD

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NSF 10 Big Ideas

- Future of Work
- Harnessing the Data Revolution
- Growing Research Convergence
- Mid-scale Research Infrastructure
- Navigating the New Arctic
- NSF Includes
- Quantum Leap
- Understanding the Rules of Life
- Windows on the Universe
- NSF 2026

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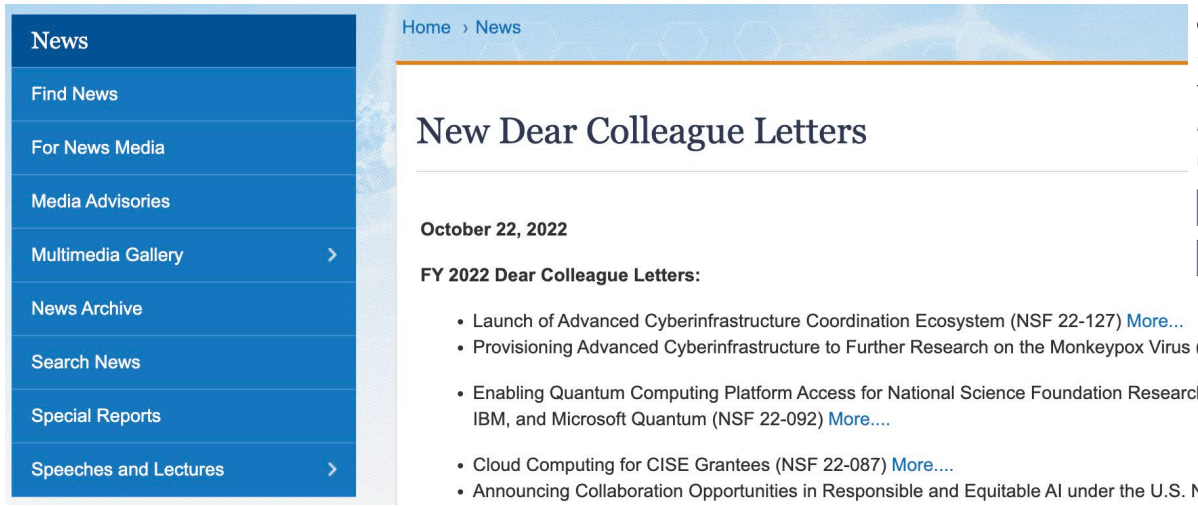
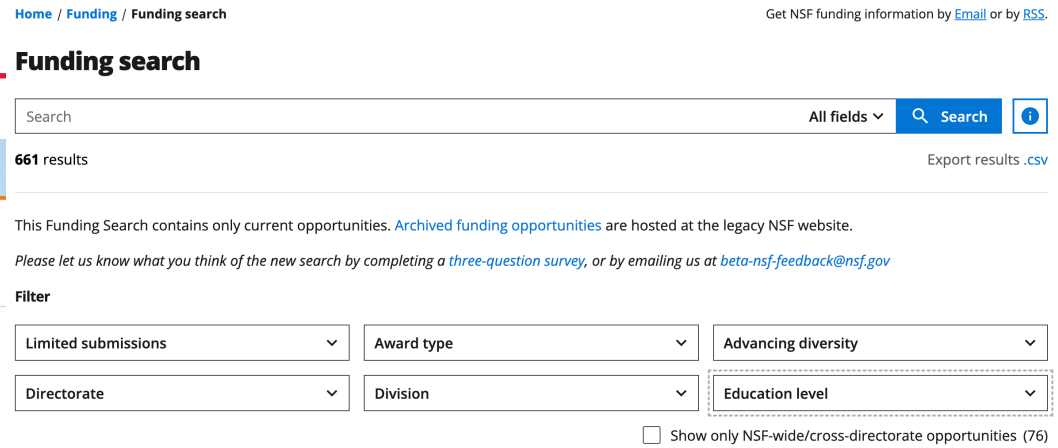
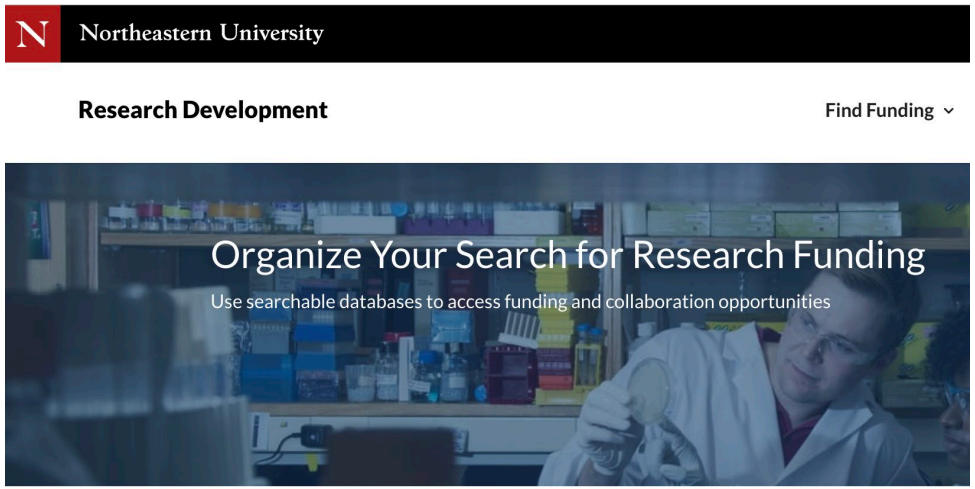
How to find funding





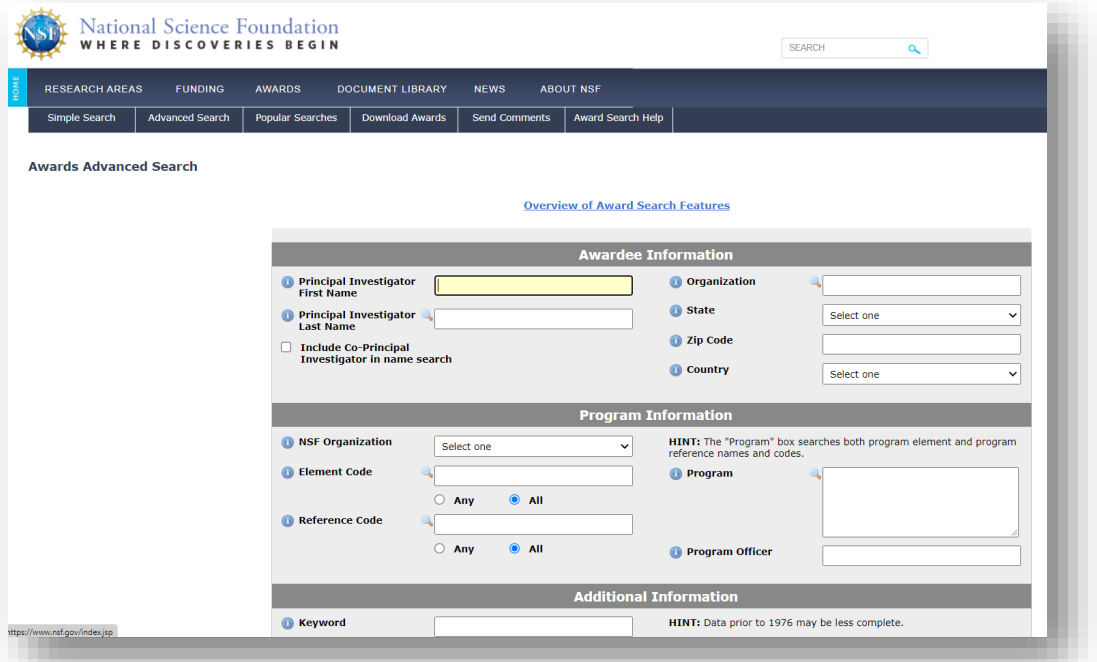
- Sign up for solicitation emails
- Dear Colleague Letters
- Reading RD emails
- Unsolicited proposals
- Supplements



NSF Signature Programs

Program	Full Name	Overview
CAREER	Faculty Early Career Development Program	Significant support for early career (pre-tenure) investigators
STC	Science and Technology Centers	Development of bold, paradigm-shifting centers, requiring significant outside partnership
ERC	Engineering Research Centers	Convergent research and innovation through inclusive partnerships and workforce development (+ planning grants)
MRSEC	Materials Research Science and Engineering Centers	Centers that collaborate with industry and other sectors on multidisciplinary materials research and education
MRI	Major Research Instrumentation	Instrument acquisition or development up to $4M
MidScale	Mid-Scale Research Infrastructure-1&-2	Research infrastructure above the level of an MRI ($4M < Type1 < $20M < Type2 < $100M)
NRT	NSF Research Traineeship	Interdisciplinary, evidence-based traineeships that advance ways for graduate students in research-based master's and doctoral degree programs to pursue a range of STEM careers
REU	Research Experience for Undergraduates	Summer research by undergraduate students (+ sites and supplements grants)
RET	Research Experience for Teachers	Summer research experiences for K-14 educators

Extremely useful tool – advanced search!

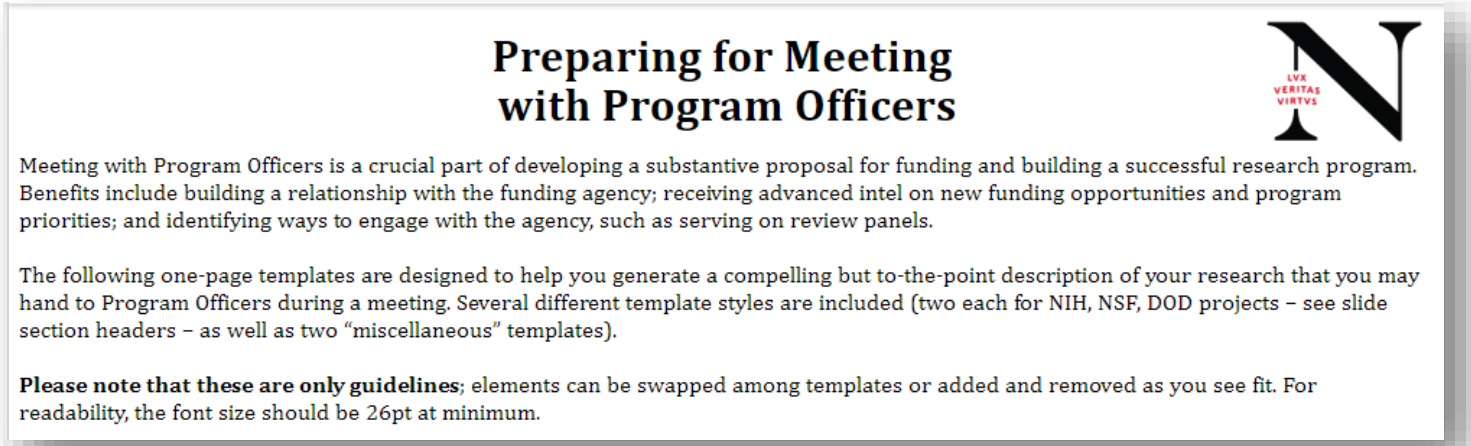


https://www.nsf.gov/awardsearch/advancedSearch.jsp

- By PROGRAM/TITLE: What has been funded by a program recently (to assess fit, request examples of proposals from people who have won)
- By KEYWORD: what work is being funded where
- Active awards is default; consider looking at expired awards as well

Talking to PMs is key!

- Connecting with researchers is their job and most really enjoy it!
- Sign up to be a reviewer
- Visit (still a work-in-progress with NSF)

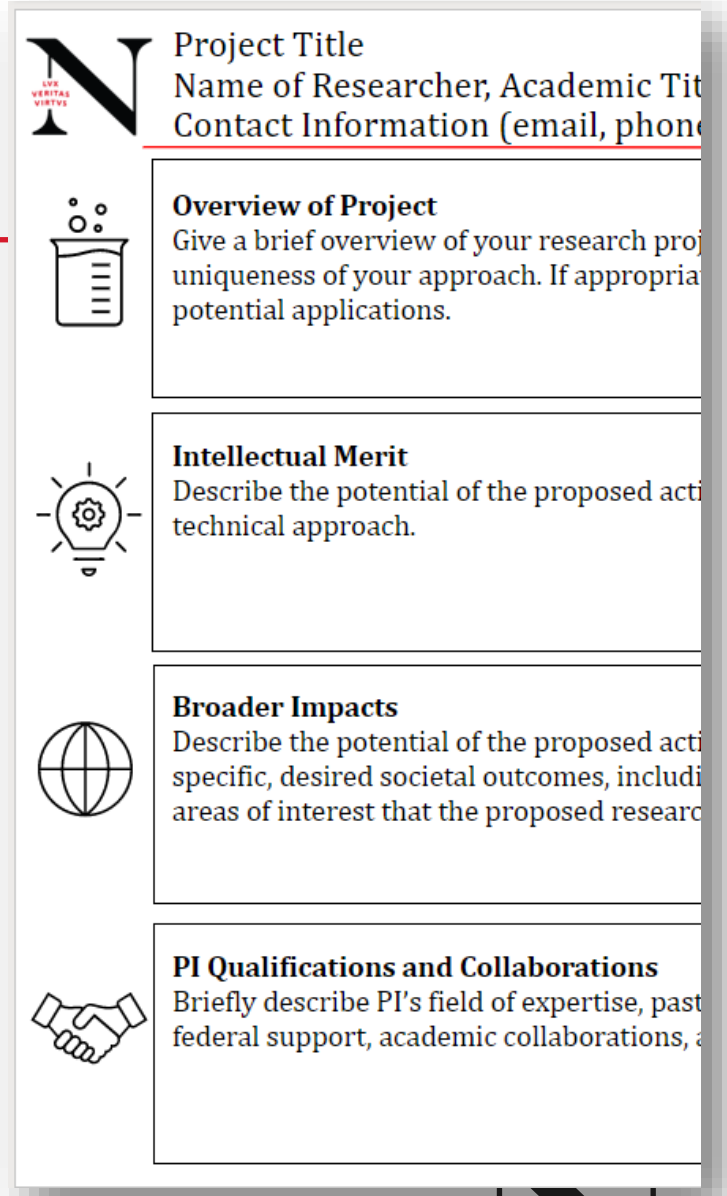


Preparing for Meeting with Program Officers

Meeting with Program Officers is a crucial part of developing a substantive proposal for funding and building a successful research program. Benefits include building a relationship with the funding agency; receiving advanced intel on new funding opportunities and program priorities; and identifying ways to engage with the agency, such as serving on review panels.

The following one-page templates are designed to help you generate a compelling but to-the-point description of your research that you may hand to Program Officers during a meeting. Several different template styles are included (two each for NIH, NSF, DOD projects – see slide section headers – as well as two "miscellaneous" templates).

Please note that these are only guidelines; elements can be swapped among templates or added and removed as you see fit. For readability, the font size should be 26pt at minimum.



Project Title
Name of Researcher, Academic Tit
Contact Information (email, phone

Overview of Project
Give a brief overview of your research proj
uniqueness of your approach. If appropria
potential applications.

Intellectual Merit
Describe the potential of the proposed acti
technical approach.

Broader Impacts
Describe the potential of the proposed acti
specific, desired societal outcomes, includi
areas of interest that the proposed researc

PI Qualifications and Collaborations
Briefly describe PI's field of expertise, past
federal support, academic collaborations,

Templates-for-Handouts-to-Funders-and-Program-Managers.pptx

NSF uses NSB Merit Review Criteria

The following elements should be considered in the review for both criteria:

- What is the potential for the proposed activity to:
  - Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
  - Benefit society or advance desired societal outcomes (Broader Impacts)?
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- 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?
- How well qualified is the individual, team, or organization to conduct the proposed activities?
- Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Your job: explicitly address all five criteria in the context of telling the reader the exciting things that you wanted to tell them anyway.

Don't forget to look for solicitation-specific criteria in addition to these

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Example: Proposing to eradicate cancer

Intellectual merit	Broader impact
I will advance knowledge in Exciting Area A in order to eradicate cancer.	Society will benefit from my eradicating cancer. In the process of eradicating cancer, I'm going to engage in related outreach/education/increasing STEM participation among underrepresented groups.
My use of Exciting Approach B makes my technical approach particularly original and transformative.	My outreach is really creative and original.
My efforts to eradicate cancer are well-organized and based on valid planning in that... I've incorporated plans to measure success.	My outreach has a great plan, including a great plan for assessment.
I'm super-well qualified to do this – I'm definitely the right person for the job.	See the great outreach I've done before? I'll definitely knock this ball out of the park.
My great expertise and resources mean that I'm well equipped to eradicate cancer.	I'll be building off of existing outreach/collaboration/NU Center for STEM.

NSF proposal components

- Establish research.gov credentials https://www.research.gov/accountmgmt/#/registration
- PAPPG https://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp
- Broad Agency Announcement Management (BAAM) https://baam.nsf.gov/s/
- Program Suitability & Proposal Concept Tool (PROSPECT) https://suitability.nsf.gov/s/

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NSF Dos and Don’ts

- Do follow the PAPPG and any solicitation-specific guidance
- Do address all NSF Merit Criteria as well as solicitation-specific criteria
- Do take an interdisciplinary approach (particularly for larger programs)
- Do elevate broader impacts and quantify the number of students or others served by the program
- Do emphasize any ongoing collaborations in your Broader Impacts
- Do cite potential reviewers – everyone likes to be noticed

- Don't assume that everyone reviewing your proposal is an expert or even more than passingly familiar with your research. Particularly at NSF, reviewers are chosen for a variety of reasons.
- Don’t put too many technical details in Intellectual Merit; stick to what is truly novel.
- Don’t prepare a background/literature review/state of the art that doesn’t include/take into account the NSF program’s recently funded work
- Don't expect an official decision in less than 6 months.
- Don’t forget that Broader Impacts should include the societal impact of your work and can include service to the community (e.g. standards development, open-source software, dataset generation, etc)

NSF submission support team

- Research Development
  - College specific (COE, COS, Khoury, Bouvé, CAMD, CSSH)
  - Other units connect with Central RD
  - Reach out EARLY
- Pre-award
  - College/unit specific teams
  - NU-RES
  - Reach out EARLY

Panelists

- Amal Ahmed, Professor of Computer Science
- Neel Joshi, Associate Professor, Chemistry & Chemical Biology
- Mohsen Moghaddam, Assistant Professor, Mechanical and Industrial Engineering

Prompts for individual introduction (5” each):

- Talk about your earlier NSF awards – how did you start to win?
- What do you find most challenging in the process and how do you deal with that?
- Best tip you have ever been given or like to give others?