

# Grant Proposals

## ICERM Professional Development Program



# Broad topics

- Research dollars and sources of funding
- Solicited vs. rolling
- Sample programs/award-type within the funding agencies
- Eligibility
- Understanding the review process
- Proposal writing and tips
- Understanding budgeting and the role of the SRO at your institution

# Research Dollars

Quotes from the American Association for the Advancement of Science<sup>1</sup>:

- federal share of university R&D remains around 60 percent.
- industry's share of total support has increased from less than 3 percent of all university R&D in the 1960s to 6 percent today.
- Academic institutions themselves are also paying for a greater share, accounting for ... more than 20 percent today.
- total university-performed R&D now surpasses \$55 billion a year in inflation-adjusted dollars, with universities themselves accounting for roughly \$12 billion.

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<sup>1</sup>From <https://www.aaas.org/programs/r-d-budget-and-policy/rd-colleges-and-universities>

# Research Funding Sources

- Simons Foundation
- Department of Defense

AFOSR	DARPA	ARO
ONR	IARPA	NSA <sup>2</sup>

- Department of Energy
- NIH
- NSF
- Special solicitations from foundations
- Institution specific (e.g. seed grants)
- Companies

Also, professional societies (e.g. AWM, SIAM) offer travel grants.

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<sup>2</sup>Workshops/conferences

# Examples of Opportunities

AMS-Simons Travel Grants: two years duration Provides \$2.5K per year to early-career mathematicians for research-related travel

Eligibility:

- PhD completed within the last four years
- Employed by US institution or be US citizen working abroad
- Not currently in residence at an NSF Mathematics Institute, and not receiving external funds with substantial support for research or travel
- Application deadline in late March

# Examples of Opportunities

Simons Collaboration Grants for Mathematicians: five year duration

- \$6K per year for collaboration, travel, and research expenses
- \$1K per year in discretionary funds for the awardee's department to enhance the research atmosphere within the department, plus \$1.4K per year in indirect costs

Eligibility:

- Must have a tenure-track or tenured position at a US institution
- Current record of active research and publication in high-quality journals
- Not hold any other grants of over \$3K per year that include support for travel or visitors during the Collaboration Grant award period
- Application deadline in late January

# Examples of Opportunities

## AWM Mentoring Travel grants:

- Provides up to \$5K
- Goal: Funds travel and accommodation for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month.

## Eligibility:

- Work address in the US
- Applications due February 1

# Examples of Opportunities

DoD Early Career awards:

- ONR [Young Investigator Program](#)
- DARPA [Young Faculty Award](#)
- AFOSR Young Investigator Research Program
- ARO Young Investigator Program



# NSF

## NSF Division of Mathematical Sciences

Many opportunities, some repeat annually, some special RFPs:

- NSF Postdoctoral Fellowships
- Standard PI grants in disciplinary programs: Algebra and Number Theory, Analysis, Applied Mathematics, Computational Mathematics, ...
- CAREER grants
- Conference grants up to large multi-institution grants
- Collaborative vs. subcontracts

Most universities require that proposals are submitted internally to the Office of Sponsored Projects some time before the NSF deadline: at Brown, 6 business days before the deadline!

# Reviews

Two kinds of reviews:

- “mail” reviews
- panel reviews: reviewers may not be in your immediate or even broader field!

People involved:

- Reviewers and panels make recommendations to program officers
- Program officers make recommendations to the Division of Mathematical Sciences
- At NSF, Grants and Agreements Division actually awards grants

# Review Criteria

Two review criteria:

- Intellectual merit: Scientific merits and your qualifications as researcher
- Broader impacts: (must now be addressed in separate section in proposal narrative)
  - ▶ Integration of research and education/training/mentoring
  - ▶ Plans to broaden participation of underrepresented groups?
  - ▶ Plans for broad dissemination, benefits to society, impact beyond the discipline?

It takes 6-8 months before you might hear from your program officer with a tentative decision

# Executive Summary

Very succinct, 1 page summary of

- Goal and Significance
- Intellectual Merit
- Broader Impacts

# Project Narrative

- Introduction
  - ▶ motivation, goals
  - ▶ intellectual merit and significance
  - ▶ broader impacts
  - ▶ team research credentials
- Background/state of the art (so your contribution can be placed within this context), literature review
- Research Plan:
  - ▶ subtopics
  - ▶ prelim results
  - ▶ figures are often worth a thousand words
- Timeline and coordination
- Previous research (check the Grant Proposal Guide for rules)
- Bibliography (separate page numbering)

# Budget

- Understanding academic year and summer salary
- Travel
- Students: tuition, fees, stipend
- Fringe rates
- Indirect vs. direct costs and institution rates
- Cost sharing (often not allowed)
- Equipment, participant support
- Justification
- Changing rates and impact on your budget

## Other paperwork

Look at the GPG to see what else is required

- Data Management Plan
- Facilities statement
- Conflict of Interest
- Budget and Justification
- Biosketch (new rules)

and any additional internal forms needed by your institution.

# Tips

- Grant writing workshops
- Talking with the program manager
- Ask a trusted colleague to review your proposal
- Ask to see a copy of a successful proposal
- Get to know your sponsored research office personnel in advance
  - ▶ They submit, not you
  - ▶ Learn the internal approval process and timelines
  - ▶ Connect personnel if collaborative proposal
- Check the GPG for requirements (and changes!)



# The Wait

- Be prepared to wait – can be 6 months or more.
- Timeline can fluctuate.
- Time from “recommendation” email to official award.
- Sometimes request for a rebudget/rescope.
- Late annual/final reports can delay consideration of other proposals!