Proposal Preparation and Opportunities for Early Career Scientists and Graduate Students

December 17, 2014

Sponsored by: AGU, The National Science Foundation, and the Earth Science Women’s Network (ESWN)

Part 1: NSF proposal preparation and merit review

Part 2: Some early career opportunities

Part 3: Connecting with NSF (meet a Program Officer)
Part 1: NSF proposal preparation and merit review

1) Finding information
2) Proposal Preparation
3) Merit Review and proposal tips
Programs available in each DIVISION (links to solicitations, contacts, recently funded awards)
Part 1: NSF proposal preparation and merit review

1) Finding information

2) Proposal Preparation
Two Policy Documents:
1) Grant Proposal Guide (GPG)
   Policy on Proposal Preparation and Submission
2) Award & Administration Guide (AAG)
   Policy on responsibilities of awardees once an award is made

The GPG = The Grant Proposal Guide
Provides guidance for preparation and submission of proposals to NSF
- Who can submit proposals?
- What is allowed in the budget?
- Format and required documents
Describes process – and criteria – by which proposals will be reviewed
Outlines reasons why a proposal may be returned without review
The Program Solicitation

Provides additional guidance for preparation of proposals to a specific call. The GPG still applies for all other issues.

Solicitations generally contain a deadline, target date, or window of submission

Proposals submitted to a specific solicitation can be returned without review if they do not meet the GPG and/or the solicitation guidelines!

Deadlines/Target Dates

Changes, if any

Does your project belong in this Program?

When in doubt – ask the PO
Points of Contact

How much money, and how many awards are expected?

Eligibility of institution and PI

Do you need Letters of Intent or Pre-Proposals?

Remember your two essential documents
Part 1: NSF proposal preparation and merit review

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The Merit Review Process

Note that this varies between Divisions!

Deadline/Target Date

↓

ad hoc review and/or

↓

panel

↓

PO makes recommendation
Merit Review Criteria

• 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

Five Review Elements

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 it incorporate a mechanism to assess success?

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

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

Broader Impact Categories (examples from EAR)

<table>
<thead>
<tr>
<th>Broader Impact Categories</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance discovery and understanding while promoting teaching, training, and learning</td>
<td>curriculum students REU educational teachers K-12 RET mentoring postdoc</td>
</tr>
<tr>
<td>Broaden participation of underrepresented groups</td>
<td>community college HBCU disability female latino HSI LSAMP minority Native</td>
</tr>
<tr>
<td>Benefits to society</td>
<td>hazards economy policy environmental local state agencies safety risk society</td>
</tr>
<tr>
<td>Enhance infrastructure for research and education</td>
<td>collaboration equipment industry infrastructure instruments international</td>
</tr>
<tr>
<td>Broad dissemination to enhance scientific and technological understanding</td>
<td>blogs community exhibits citizen-science database media museum public</td>
</tr>
</tbody>
</table>
Who are the *ad hoc* reviewers and panelists?

- Accomplished
- Dedicated
- Knowledgeable
- Conscientious
- Fair

- Over-committed and overworked
- Underpaid for their efforts (or not at all)
- Inherently skeptical
- Varied in critical style
- Human

What are the reviewers looking for?

- Novel Idea /Research Question
- Well written
- Well justified – others care about it
- Research plan that can answer the question in a more definitive way
- Demonstration that you and your team can do the work with the resources available to you
The Winning Formula

• Ask yourself and convince reviewers
  – What do you intend to do that others want to know?
  – Why is the work important, innovative and exciting?
  – What has already been done and why is your way better?
  – How are you going to do the work to answer the question uniquely?

• Prepare yourself and demonstrate knowledge
  – Literature survey and discussions with others
  – Get preliminary data for research and education components
  – If you do not have access to the best facilities, who will you collaborate/partner with to make it happen.

Common Mistakes (IM)

• Work is too close to what has been done before - i.e., Incremental advance
• Techniques and methodology are not cutting edge
• Project has too large a scope or is too narrowly focused to be exciting
• Proposed methods/research plan are not likely to yield results that will address the stated goals of the project
• The experiment/theoretical/analytical design is flawed
• Resources not available or PI does not have demonstrated expertise in it
Common Mistakes (BI)

- No details of the BI in the Project Description
- No results from prior support (if applicable)
- Not highlighting which aspects of the project will be carried by students
- Not explaining how the project could impact other fields
- No statement regarding how the data will be shared with the broader community (Data Management Plan)
- Post-doctoral mentoring plan is weak
- Partnerships are one-sided and not synergistic
- Regurgitating of the same BI paragraph written in the Project Summary

The other side of the coin: being declined

- It happens to everyone, except those who don’t submit
- Learn from it; Interpret reviews thoughtfully; don’t take them personally
- Identify common themes across different reviews (weaknesses AND strengths)
- Don’t fixate on minutia + cranky comments
- Ask a friend/collleague to read the reviews objectively
- Know that NSF receives very few poor proposals – most are good, competitive science. Several factors go into each decision
Basis for the decision (1)

• Peer Review
  – Content of the review is more important than rating
  – Program Officer analyzes: Fairness and substance of the reviews; any technical issues raised (can they be resolved swiftly and easily); reviewer’s enthusiasm for the project; any additional feedback from reviewers/panels or other program officers; sometimes also clarification from the PI if needed

Basis for the decision (2)

• Portfolio Balance
  – Research and education topics and their integration; potential for transformative impact in both; priority or timeliness of the area of research and systems; demographics of the PI population and diversity of institution types; stage of the career development of the PI; international partnerships
Questions about:

Finding information,
Proposal Preparation, or
Merit Review and proposal tips?

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Part 3: Connecting with NSF (meet a Program Officer)
Part 2: Some Early Career Opportunities

1) IUSE: GEOPATHS
2) Graduate Research Fellowship Program
3) New Initiatives in Graduate Education National Science Foundation Research Traineeship (NRT)
4) Post-Doctoral Fellowship Program
5) OCE Research Initiation Grants (RIG)
6) Faculty Early-Career Development Program (CAREER)

IUSE: GEOPATHS
Improving Undergraduate STEM Education: Pathways into Geoscience

Track 1: GEOPATHS-EXTRA
Engaging students in geoscience through cohort-based extra-curricular experiences and training

Track 2: GEOPATHS-IMPACT
Improving the pathways into geoscience through institutional collaborations
- facilitates transitions at critical points, e.g. HS > undergrad geoscience programs, 2 year > 4 year colleges
IUSE: GEOPATHS
Improving Undergraduate STEM Education: Pathways into Geoscience

Up to $500,000 – Up to 3 years

Letters of intent (Required) January 5 / Full Proposals March 16

Letters of intent (Required) August 14 / Full Proposals October 5

Information: geopaths@nsf.gov

NSF Graduate Research Fellowship

SUPPORT
3 years of support
$32,000 Stipend per year
$12,000 Educational allowance to institution
International research opportunity: GROW
Supercomputer access: XSEDE

ELIGIBILITY
US citizen, national, or permanent resident
Early-career graduate students
Pursuing research-based MS + PhD
Enrolled in accredited US institution

nsfgrfp.org
New Initiatives in Graduate Education
National Science Foundation Research Traineeship (NRT)

- a new 2014 initiative designed to promote the development of innovative, evidence-based models for graduate education while catalyzing cutting-edge research in high priority research areas

- first NRT solicitation was released on March 24, 2014; data-enabled science and engineering (DESE) was the priority research theme

- 258 NRT proposals received, 65% DESE and 25% on other interdisciplinary themes

- next solicitation is expected to be released shortly; it will include a $7M Innovations in Graduate Education Track dedicated solely to piloting, testing, and evaluating innovative, new approaches to graduate education

How is NRT different from IGERT (Integrative Graduate Education and Research Traineeship)?

- Trainees are more broadly defined as ALL students who benefit from the training elements, not just those funded on the NRT grant via stipends

- Traineeships can be for MS or PhD students (or both)

- Students must receive professional development/training that includes preparation for careers outside of academia.
**GEO Postdoctoral Fellowships**

**Details vary by Division**

**SUPPORT**
- 24 months
- ~$174k directly to the fellow
- some $ for expenses and benefits

**GOALS**
- Recognize investigators with significant potential
- Provide research experience and broaden perspective
- Enable and establish leaders within the community

**ELIGIBILITY**
- US citizen, national, or permanent resident
- Within 3 years of PhD
- Have or will receive PhD by start of fellowship
- Not have worked more than 18 or 24 FTE months in positions requiring PhD

OCE has 2 Tracks:
- Track 1: Broadening Participation
- Track 2: Intellectual collaboration with foreign scientists

**DEADLINES**
- OCE: December
- AGS: January
- EAR: July

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**GEO OCE Research Initiation Grants**

**SUPPORT**
- 12-24 months
- $100k total (direct + indirect)
- No PI or other senior salary

**GOALS**
- Provide startup funding for researchers who have recently been appointed to tenure-track (or equivalent) positions
- Enhance those PI’s research careers, and broaden participation of under-represented groups in ocean sciences

**ELIGIBILITY**
- US citizen, national, or permanent resident
- Have accepted or be in tenure track Assistant Professor or equivalent position, and have been in position no more than 3 FTE years
- Have not received salary support as PI/co-PI on new federal research grant since starting position

**TARGET DATE:** January 12, 2015
CAREER
Faculty Early-Career Development Program

Designed to be a prestigious program to help a junior faculty member develop activities that can effectively integrate research and education within the context of his/her organization.

www.nsf.gov/career

- 5 year duration
- minimum $400,000 total ($500K in BIO + PLR)
- PI needs to be on a tenure-track (or equivalent) appointment at the rank of assistant professor
- In GEO, CAREER proposals are reviewed and funded primarily by the Research Programs

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Motivation to contact a Program Director?

- Learn about existing and new programs
- Volunteer to review
- Administrative questions
- Determine the appropriateness of a proposal
- Gain program insights, learn about priorities

An NSF Program Director is:

- A scholar in your field who knows and works for your scientific community
- A facilitator of the scholarship of your profession
- A coordinator of the review process
- A recommender of proposals for support
- An overseer of grants, budgets, and projects