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Access this presentation at:
http://www.research.psu.edu/offices/siro/siro-forms-resources

Note: Some material from “Finding funding and basics” section slides adapted from Keith R. Aronson, Ph.D., Associate Director, Social Science Research Institute. Thank you Keith.
“Two-way Street of Matching”

a) Who would fund the work I do (or at least some version of it)?

b) What opportunities are out there that can shape my grant idea(s)?

Often it’s a combination of both!
Apply to the "Right" Place

1. Need to submit to the "right" place
2. Need "options" – more than one place can be "right"
3. Need to search, won’t fall in your lap.

The "right" funder is the one that wants to pay you to do your research!
Finding External Funding...

with your research project/idea in hand...

- Step 1: Search Funding Opportunity Databases
- Step 2: See What is Already Being Funded
- Step 3: Set up Funding Alerts
College Research Offices:
Information About Funding Agencies
Budget and Management Planning
Final Proposal Preparation & Associated Technical Assistance
Proposal Submission and Grants Management

College-based Research Centers:
Programmatic Research Development in Theme Areas
Interdisciplinary Partnerships & Resources
Information about Funding Opportunities within Theme Areas

Interdisciplinary Institutes: SSRI, PSIEE, EESI, HILS, etc
Complete list at http://www.research.psu.edu/

Office of Sponsored Programs
Soup to Nuts Service from Seeking Funds to Getting Award
Funding Searches Through Penn State Office of Sponsored Programs

&

All about Preparing Proposals

http://www.research.psu.edu/osp/find-funding/
Subscribe to NSF Updates for Automatic Funding Alerts

https://service.govdelivery.com/accounts/USNSF/subscriber/new

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- Discoveries - All NSF Discoveries
- Discoveries by Program Area (Do not select if you chose All NSF Discoveries above)
- Events - All NSF Events
- Events by Program Area (Do not select if you chose All NSF Events above)
- Funding Opportunities: All NSF Program Announcements and Information
- Funding Opportunities - Program Announcements and Information by Program Area (Do not select if you chose All NSF Program Announcements and Information above)
  - Program Announcements and Information - Biology (BIO), including NSF-wide
  - Program Announcements and Information - Computer/Information Sciences (CISE), including NSF-wide
  - Program Announcements and Information - Crosscutting Programs
  - Program Announcements and Information - Cyberinfrastructure (OCI), including NSF-wide
  - Program Announcements and Information - Education (EHR), including NSF-wide
  - Program Announcements and Information - Engineering (ENG), including NSF-wide
  - Program Announcements and Information - Environmental Research (ERE), including NSF-wide
  - Program Announcements and Information - FastLane Announcements
  - Program Announcements and Information - Geosciences (GEO), including NSF-wide
  - Program Announcements and Information - International (OISE), including NSF-wide
  - Program Announcements and Information - Math/Physical Sciences (MPS), including NSF-wide
  - Program Announcements and Information - NSF-wide
  - Program Announcements and Information - National Science Board (NSB)
  - Program Announcements and Information - Polar Programs (OPP), including NSF-wide
  - Program Announcements and Information - Social/Behavioral Sciences (SBE), including NSF-wide
  - NSF-wide
Just one example from the Fogarty International Center, the international arm of the NIH [http://www.fic.nih.gov/FUNDING/NONNIH/Pages/postdoctoral.aspx](http://www.fic.nih.gov/FUNDING/NONNIH/Pages/postdoctoral.aspx)

Currently 85 international opportunities for postdocs in biomedical and behavioral research
Example - http://www.spo.berkeley.edu/ Fund/ newfaculty.html

Federal Agencies

- Department of Agriculture
- Department of Defense
- Department of Energy
- NASA
- National Institutes of Health
- National Science Foundation

Nonfederal Agencies

Examples:
1. NSF, NIH, USDA, & Foundation Doctoral Dissertation Improvement Grant
2. EPA STAR Fellowships
2. NSF CAREER
3. New/Young Investigator Programs of NASA, ONR, Air Force, Army, USDA NI FA, NIH, DOE, DARPA, DHS, etc
NSF PROPOSALS
HOW DO I WIN?

1. Know your field - Do your homework
2. Apply the Hook – High risk, high reward
3. Remember the Buddy System – Mentoring and Review
BASIC COMPONENTS OF AN NSF PROPOSAL

- Cover page
- Project summary/Abstract
- Project Description
- References
- Current and Pending Support
- Budget
- Budget Justification
- Biographical Info
- Facilities, Equipment & Other Resources
- Data Management Plan
- Suggested referees
Main body of proposal – it must describe what you want to get done in enough detail to be understood (too much detail is not necessarily a good thing)

Usual Content
- Background/previous work
- Research Plan
- Educational Component
- Timeline (sometimes required)

Must follow agency’s length guidelines

A separate Broader Impacts section as part of the narrative must now be included
How to write a successful NSF proposal

The best things you can do to prepare:

- Be a proposal reviewer/panelist yourself.
- Meet with the NSF program director in your area.
- Read successful (and unsuccessful) proposals and their reviews.
- Ask a knowledgeable colleague to critique your proposal before you submit it.
Reviewers are typically busy academics like you. They appreciate *good basic science*. Some will have intimate knowledge of the problem you are researching, *most will not*. A clear, well-written proposal helps the second group appreciate the value of your ideas. You will need to convince them *early* that the problem is important and that your idea is great.
Outline of a 15-page NSF proposal

- **1-2 pp. of broad context and background**
  - Why is the problem important?
  - What is already known about it? (It’s important to do your homework thoroughly here!! – shoot for 100+ references)
  - What are the major goals for 5-10 years?

- **2-3 pp. of prior work/your current research on the problem**
  - Be explicit about the key contributions you have made (high profile, published papers are very useful here)
  - This is a good place for the required “results from prior NSF support,” if applicable.

- **5-7 pp. of proposed work, well illustrated and focused on basic science questions. OK to intersperse some current work here.**
Outline of a 15-page NSF proposal (cont’d)

1-2 pp. of broader impacts
- Integrating education and research
- Preparing students for careers in STEM
- Outreach beyond the university community

1 p. summary, timeline, human resources (optional)
- Briefly summarize key elements of the proposal
- Who will perform which tasks (both research and education/outreach)

Final 1-2 paragraphs, a conclusion about why this research is important, and what long-term benefit it will bring to the scientific community.
Graphics are important: 1-2 per page
• Even small figures convey a lot of visual information, and help break up the text for the reviewer.
Bulleted questions are useful for the reviewer.
NSF supports transformative research but reviewers are very conservative. One bad score can kill your proposal.

Use the 1/3 – 1/3 – 1/3 formula:

- 1/3 of the research plan is devoted to ideas that you are 90% sure will work.
- 1/3 is more exploratory (with contingency plans). This is where you convince the reviewers you are doing something novel.
- Final 1/3 can be really creative, but must acknowledge the risk.
What to propose

- NSF supports *basic scientific research* but is responding to pressure to be more relevant/applied.

  - If you can articulate your ideas in the form of *questions*, you are proposing to do basic science.

  - A good strategy is to use a list of *questions* as the outline in your proposed research section.

  - Ask yourself (as the reviewer’s will ask): Is what I am proposing at the intellectual forefront of the field?

- **Knowledge vs. widgets:**
  - What will we learn that we don’t know now?
  - **Not:** What will we *have* that we don’t have now?
Not: We will develop a system that will diagnose cancer early, to the great benefit of humankind.

Instead:
- It is important to diagnose cancer early because...
- It can’t be done now because...
- We are going to make it possible by solving the following fundamental problems...
- We will then demonstrate what we have learned in the following model system...
The most common reasons for negative reviews

- The proposed work is not novel ("it’s already been done")
- The ideas are not exciting or significant
- No track record in the area, lack of preliminary data
- Not enough detail about what is being proposed
- Poor balance of proposed research/outreach
- The plan is too ambitious/not realistic
  Avoid laundry lists of tasks and ideas!
- The proposal is poorly written
  It should provide a concise review & road map for the work
  Anticipate problems and their solutions
  Spell check!
  Print the proposal out and check it over carefully
Framing Phase – Weeks 1-4
Identify appropriate mentors (i.e., who will be at the institution where you plan to be conducting the research)
Interpret solicitation - ask any clarification questions you have of a cognizant officer
Define outline (Vision, Goals*, Themes)
Develop writing timeline
Identify graphics
Estimate budget and refine aims to fit the budget (common mistake of young investigators is being too ambitious in aims or goals)
Get mentor input

Collaboration Phase – Weeks 5-8
Identify any collaborators and resources (e.g., data management, equipment, analyses) needed
Identify any commitment letters needed and develop template drafts
Refine budget according to resources
Develop graphics
Create a level zero draft of proposal content including project summary and project description
Map Level Zero draft against solicitation requirement and review criteria and start 2nd draft
Solicit potential pre-submission reviewers (2 or 3 senior faculty and mentors)
Form data management plan
Draft Biosketch and other support documents such as current and pending support

Refinement Phase – Weeks 9-12
Second level draft – review ready
Receive review from peers and mentors
Third draft – near final
Final polished draft – one last read (out loud)
Finalize commitment letters
Finalize budget
Finalize CV and C&P
Questions?
Additional NSF Information
Throughout the proposal and captured in the one page summary, National Science Board merit review criteria focus on intellectual merit and broader impacts, as minimum. If more considerations are to be made they are shown in the solicitation.

- What is the intellectual merit of the proposed activity?
- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.)
- To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources?
Proposers must address both intellectual merit and broader impacts, but reviewers will be asked to address only those considerations relevant to the proposal being considered and for which the reviewer is qualified to opine.

- What are the broader impacts of the proposed activity?
- How well does the activity advance discovery and understanding while promoting teaching, training and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc)?
- To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks and partnerships?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the activity to society?