Funding Opportunities at the National Science Foundation

Strategies for Success

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Presentation

- Overview of NSF
- Competitive Proposals and the Review Process
- Programs of Interest
NSF in a Nutshell

- Established as an independent agency (NSF Act of 1950)
- National Science Board
- Supports basic science and education
- Organized into discipline-based Directorates and Offices
- Special responsibilities: US Antarctic Program, Science and Engineering Indicators, International
- Budget: 5.6 billion (FY06); ~6 billion
- Makes 11,000 new awards from > 40,000 submissions with approx 23% success rate
- Supports ~200,000 faculty, researchers, fellows, students
- Uses rotators, visiting scientists, IPAs
Division of Molecular and Cellular Biosciences (MCB)

Supports research and related activities that contribute to a fundamental understanding of life processes at the molecular, sub-cellular, and cellular levels

- Biomolecular Systems Cluster
- Cellular Systems Cluster
- Genes and Genomes Systems Cluster
Division of Integrative Organismal Systems (IOS)

Emphasizes systems critical to the form, function, development, and evolution of organisms

- Behavioral Systems Cluster
- Developmental Systems Cluster
- Environmental & Structural Systems Cluster
- Functional & Regulatory Systems Cluster
Division of Environmental Biology (DEB)

Supports fundamental research on populations, species, communities, and ecosystems

- Ecological Biology Cluster
- Ecosystem Science Cluster
- Population and Evolutionary Processes Cluster
- Systematic Biology and Biodiversity Inventories Cluster
Division of Biological Infrastructure (DBI)

supports varied activities that provide infrastructure for contemporary research in biology including research resources and human resources

- **Human Resources Cluster**
- **Research Resources Cluster**
- **Plant Genome Research Program**
- **National Ecological Observatory Network**
Emerging Frontiers (Cross Directorate)

- **Frontiers in Integrative Biological Research (FIBR)**
  Large-scale integrative projects - up to $5 Million for up to five years

- **Research Coordination Networks (RCN)**
  Research efforts across disciplinary, organizational, institutional, and geographical boundaries

- **Nanoscale Science & Engineering (NANO)**
  Exploitation of physical, chemical, and biological properties of systems in the range of 0.1 - 100 nanometers; nanobiosensors

- **Other Programs – See EF homepage**
Types of Proposal Submission

Solicited vs. Unsolicited

- No deadlines
  (e.g. workshops, SGERs)

- Deadlines

- Target dates

- Submission Windows

- Preliminary proposals

• Solicited proposals have a published Program Solicitation / Program Announcement

• Unsolicited proposals are associated with regular research programs (check websites and GTP)
Where do you submit your ideas?

http://www.nsf.gov

Directorate → Division → Programs → Information on NSF contacts, award abstract, program description, deadlines

Guide to Programs (GTP)
Grant Proposal Guide (GPG)
Sign up for “My NSF”
Preparing a *Competitive Proposal*

and

The Review Process
A Good Proposal

A good proposal is a good idea, well expressed, with a clear indication of methods for pursuing the idea, evaluating the findings, and making them known to all who need to know.

A *Competitive* Proposal is…

- All of the above
- Appropriate for the Program
- Responsive to the Program Announcement
What to Look for in a Program Announcement

Read the Program Announcement Carefully

Pay special attention to:

- Goal of program
- Eligibility
- Special requirements

For any questions…

call your Program Officer
NSF Review Criteria

- Criterion 1 - What is the *intellectual merit* of the proposed activity?

  This criterion addresses the overall quality of the proposed activity to advance science and engineering through research and education.

- Criterion 2 - What are the *broader impacts* of the proposed activity?

  This criterion addresses the overall impact of the proposed activity.

*Obtain a copy of a successful proposal. Check Award Abstracts search page. Things change, get a recent award.*
Getting Started

- Take your best research ideas for which you have some preliminary data
- Develop hypotheses and experiments to take the next step(s).
- Consider feasibility in a 36 to 60 month window
- Consider what assistance you will need given teaching and other time commitments
- Prepare a plan of attack
Getting Started

- Communicate with a program officer
  - Assist in program selection
  - Provide advice about how to proceed
- Examine prior NSF awards in similar areas
  - Link to award information through BIO Award Search
    - Search by subject, institution, PI name
Grant Proposal Guide (GPG)

- **GUIDANCE AND REGULATIONS** - Preparing and submitting proposals

- **DESCRIBES PROCESS** - for declinations, returns withdrawals, and awards; significant grant administrative highlights.
NSF Decision-making for Unsolicited Proposals

INSTITUTION

Proposal Submission via Fastlane

Assignment To Program

Merit Review Process

Returned Without Review

Mail reviews

Panel review

Program Officer Recommendation

Division of Grants and Agreements

Division Director Review

AWARD

DECLINE
What does 'Merit Review' really mean?
NSF invests in the great ideas from capable people as determined by competitive merit review.

**Criterion 1:** What is the intellectual merit of the proposed activity?

**Criterion 2:** What are the broader impacts of the proposed activity?
Criterion 1: Intellectual Merit

- Potential to *advance knowledge* and understanding within and across fields
- *Creativity and originality* of ideas
- Conceptualization and *organization*
- *Qualifications* of investigators
- Access to *resources*
- Established *expertise* or expert *collaborations*
Criterion 2: Broader Impacts

- Advancement of discovery and understanding while promoting teaching, training and learning
- Participation of underrepresented groups
- Enhancement of infrastructure for research and education
- Dissemination of results to enhance scientific and technological understanding
- Benefits to society
How can I be successful in obtaining funding?
Tips for Success

- Review proposals that have been funded
  - Contact PI’s
- Have more than one person read your proposal prior to submission
  - Peers AND scientists not in your area.
- If Rejected - Try Again
  - Talk with the Program Officer
  - Pay attention to Reviewer’s comments
  - Attend a Grant-writing workshop
Understand Review Process

- Proposals may be reviewed in panel, using mail review (ad hocs), or a combination of both

- The review process usually takes about six months to a decision
NSF Panel Review (most research divisions)

- The panel is an advisory committee composed of ~10-20 people depending on # of proposals
- Each proposal must receive at least 3 reviews
- In panel, each reviewer describes his/her views of the proposal to the rest of the panel
- The panel as a whole then discusses the proposal
- The proposal is then placed in a funding recommendation category (e.g. Fund, Fund if Possible, Do not fund)
Proposal Funding
Recommendations

The Program Director makes funding recommendations to the Division Director based on:

- The advice of the panel
- Budgetary constraints
- Other programmatic considerations (geographic distribution, type of institution, PI demographics, potential high payoff, etc.)
Getting on a Panel

- Contact your program director
- E-mail your CV to your program director
- Include your contact information
- Indicate your areas of expertise
- Follow up with a phone call
- Be polite, pleasant, and persistent (don’t give up)
Additional Funding Strategies

Determine if the main emphasis of the proposed work is *research* or *teaching*.

Consult the NSF website and *Guide to Programs* to locate a likely program ("home" for your project).

Call the Program Director to determine if your project is appropriate.
Programs of Interest

B I O
E H R

Cross-Cutting Foundation-Wide
Emphasis on 2-yr college
Supports curriculum development, faculty development
Pathways from secondary schools to 2-yr colleges, and 2-yr to 4-yr institutions
Improvement of instruction and better preparation of students for entry into high-tech jobs and into 4-yr institutions
EHR Directorate
Division of Undergraduate Education

Course, Curriculum, and Laboratory Improvement (CCLI)
NSF 07-543 Due Jan 10, 2008

- Improve the quality of STEM education
- Supports creation of new learning materials and teaching strategies
- Supports development of faculty expertise
- Conduct research on STEM teaching and learning
- Three types of projects
  - Small exploratory projects → large comprehensive projects
Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences

NSF 07-539 past Apr 4, 2007

“enhance undergraduate education and training at the intersection of the biological and mathematical sciences and to better prepare undergraduate biology or mathematics students to pursue graduate study and careers in fields that integrate the mathematical and biological sciences”
EHR Directorate
Human Resource Development (HRD)

- Historically Black Colleges and Universities Undergraduate Program (HBCU UP)
- Centers of Research Excellence in Science and Technology (CREST)
- Tribal Colleges and Universities (TCUP)
- Alliances for Broadening Participation in STEM (ABP)
- Louis Stokes Alliances for Minority Participation (LSAMP)
- Model Institutions for Excellence (MIE)
Research Initiation Grants (RIG) In Biological Sciences

- Broaden the Participation of Scientists from Under-represented Groups
- Assist members to become actively engaged in research as independent investigators
- Estimated Awards (15 - 25) - about $3 Million annually

Solicitation 07-560
Due Date: 2nd Monday in Jan
Career Advancement Awards (CAA) In Biological Sciences

- Broaden the Participation of Scientists from Under-represented Groups

- Targets Scientists other than Beginning Investigators to Enhance Career Development
  - Improve Competitiveness for Research Funds
  - Acquire New Skills/Tools for Contemporary Research

- Estimated Awards (15 - 25) - about $3 Million annually

Solicitation 07-560
Due Date: 2nd Monday in Jan
Research Opportunity Awards (ROA)

- Provide support for faculty from PUIs to participate in ongoing, NSF-funded research projects for limited periods, usually a summer.

- Goal -- Provide research experience for faculty to enhance research at home institution and host lab, improve research & teaching.

- Funded as supplements to active NSF grants:
  - Salary or stipend for undergraduate faculty
  - Travel to host lab and/or to attend a meeting
  - Research supplies

- Making connections with an NSF grantee:
  - Network at scientific meetings
  - Consult NSF FastLane list of awards in relevant program
  - Contact NSF Program Director in your area of interest (Consult the NSF web site for contact information)
Research at Undergraduate Institutions (RUI)

- Designed to support Research in Predominantly Undergraduate Institutions (PUI)
- RUI is a mechanism, not a separate funding stream
- ~10% of proposals submitted to BIO research programs are RUIs
- “RUI” should be designated in the title of the proposal
- Five page (max) “RUI impact statement” must accompany proposal
Research at Undergraduate Institutions (RUI)

- Supports research by faculty with active involvement of undergraduate students
- Strengthens the research environment in departments that are oriented primarily toward undergraduate instruction
- Integrates research and education at predominantly undergraduate institutions

Target Dates in January and July
Undergraduate Research and Mentoring in the Biological Sciences (URM)

- Research training program for under-represented minority students
- **Goal:** increase the ethnic diversity of graduate students in PhD programs
- Year-round mentoring and enhancement activities
- **Five-year awards, up to $1 million**

Solicitation 06-591
Due Date: Prelim 9/13/07 Full 3/04/08
Faculty Early Career Development Program (CAREER)

- Supports teacher-scholars who will become the academic leaders of the 21st century
- Supports plans that effectively integrate research and education
- Funding approx $100,000/year for 5 years

Solicitation 05-579
Due Date: July 19, 2005
Major Research Instrumentation (MRI)

- Acquisition or development of major research instrumentation
- Maintenance and technical support associated with these instruments
- Proposals may be for a single instrument, a large system of instruments, or multiple instruments that share a common research focus
- Coordinated thru the Office of Integrative Activities (NSF-wide)
- Emphasis must be on research

Deadline Date: Fourth Thursday in January
Program Solicitation: NSF 07-510
Research Experiences for Undergraduates (REU)

- Two mechanisms: Sites and Supplements
- Research training program for undergrads
- Sites: Usually 10 weeks in summer for 10 students
- Hands-on participation in research leading to presentations and publications

Solicitation NSF 07-569
Due Date: Sep 13, 2007; Aug 18, 2008
Small Grants for Exploratory Research (SGER)

- Small-scale, exploratory, high-risk/high-impact
- Contact the NSF program officer(s) most germane to the proposal topic before submitting a SGER proposal
- Project description 2 to 5 pages, $200,000 budget maximum
Opportunities for Supplementing Ongoing Awards

- **Research Experiences for Undergraduates (REU)** supports undergraduate researchers
- **Research Opportunity Award (ROA)** for faculty at predominantly undergraduate institutions to participate in NSF-supported projects
- **Research Experiences for Teachers (RET)** builds long term collaborative relationships between K-12 teachers of science and mathematics and the NSF research community
- **Research Apprenticeship for High School Students (RAHSS)** supports HS student research
Funding Strategies
Visit NSF

- Types of people that visit NSF
  - Researchers/Science Educators
  - Office of sponsored research personnel
  - Deans/Administrators

- If you anticipate being in the DC area, call your Program Director(s) and make an appointment(s)

- Investigate setting up a special group visit
Getting Support

- NSF Publications
  - Program Announcements
  - Grant Proposal Guide
  - Web Pages
  - Funded Project Abstracts
  - Reports, Special Publications

- Successful Colleagues - on campus or at similar institution
  - Mentors on Campus
  - Previous Panelists
  - Serve As Reviewer
  - Sponsored Research Office
  - Successful Proposals
  - Program Officers
    - Incumbent
    - Former Rotators
A Declination
How to Gain from the Experience
Success rate for most programs is ~25%

**Read the written Reviews and the Panel Summary**
- What guidance was provided for improvements?
- Did reviewers misunderstand your intentions?
- Were reviewers from outside your field confused?
- Was proposal submitted to the wrong NSF program?
- Remember reviews were tempered by panel discussion
- Your Program Director or faculty mentors can help you interpret the reviews

**Call the Program Director for guidance and interpretation**
Summary

- Start early – give yourself enough time
- **Read the PA** and follow rules in GPG
- **Get feedback on your proposal from your colleagues**
- Proposals should be cogent, appropriate, and justified
- Study reviews carefully (award or declination)
- Anticipate criticisms (better – *invite criticism*)
- Anticipate some frustration (and remember 3Ps)
- If declined - **Call your Program Director** after reading your reviews (take some time to think about them)
- If awarded - follow up on reporting and find out about supplemental funding (stay in touch with PD)
Keeping Abreast of NSF Opportunities

“My NSF” Custom News
(set your own profile – weekly email update)

http://www.nsf.gov/mynsf/