



# Funding Opportunities for Young Scientists and Engineers at the National Science Foundation

NIEHS Webinar

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National Science Foundation



# National Science Foundation

National Science Board

Office of the Director  
France A. Córdova



Biological Sciences



Computer and  
Information Science  
and Engineering



Engineering



Geosciences



Mathematical and  
Physical Sciences



Social, Behavioral, and  
Economic Sciences



Education and Human  
Resources

# General Advice for NSF Applicants

- Proposed research or education must be in a field supported by NSF.
- READ THE SOLICITATION
- Call the program officer for clarification
- Know the review criteria
  - Intellectual merit
  - Broader impacts
- Panels rank proposals in broad categories
- Program officers have the discretion to balance a program's portfolio.

# What Research Fields Does NSF Support?

- Statement in the Grant Proposal Guide:
- NSF does not normally support technical assistance, pilot plant efforts, research requiring security classification, the development of products for commercial marketing, or market research for a particular project or invention.
- Research with disease-related goals, including work on the etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals, is normally not supported. Animal models of such conditions or the development or testing of drugs or other procedures for their treatment also are not eligible for support.
- However, research in bioengineering, with diagnosis- or treatment-related goals, that applies engineering principles to problems in biology and medicine while advancing engineering knowledge is eligible for support. Bioengineering research to aid persons with disabilities also is eligible.

# How Grant Proposals are Reviewed at NSF

- Proposals responding to a solicitation are grouped into panels.
- Panelists/reviewers write and submit reviews based on Intellectual Merit and Broader Impacts, rating each proposal as Excellent, Very Good, Good, Fair, or Poor.
- At panel (in-person or virtual) proposals are discussed and ranked
  - Categories such as High, Medium, and Low Priority
  - No numbers are assigned. There is no “cut line.”
- The program officer selects the awards, with final approval by the Division Director.

# How to Search for Awards

- On the NSF homepage go to Awards and then Search Awards.
- Use Advanced Search
- Enter a key word or words
- Check either Active or Expired Awards
- Choose award date if desired.
- Results will include the NSF division and program officer making the award, and a link to the abstract.

# Information for graduate students

- Federal portal
  - <http://stemgradstudents.science.gov/>
- NSF opportunities
  - [http://www.nsf.gov/funding/education.jsp?org=NSF&fund\\_type=2](http://www.nsf.gov/funding/education.jsp?org=NSF&fund_type=2)
- Graduate students apply to NSF for:
  - Graduate Research Fellowship program
  - Doctoral Dissertation improvement Grants
  - East Asia and Pacific Summer Institutes for U.S. Graduate Students (EAPSI)

# Graduate Research Fellowship program

- Must be U.S. citizen, national, or permanent resident.
- Must not have completed more than 12 months of graduate study.
- May be currently enrolled.
- Read the solicitation for an explanation of other complexities in eligibility.



# Doctoral Dissertation Improvement grants

- Offered only by some programs/directorates.
- Most subject areas covered are in the social behavioral and economic sciences, biological sciences, and mathematical sciences.
- Typically cover about \$10K-\$15K research expenses (not stipends).
- Each solicitation specifies what costs are eligible.

# EAPSI

- Research experiences for graduate students in Australia, China, Japan, Korea, New Zealand, Singapore or Taiwan.
- An introduction to the science, science policy, and scientific infrastructure of the respective location.
- An orientation to the science, culture, and language.
- NSF summer stipend of \$5K plus orientation and roundtrip airplane ticket to the location.

# Indirect Graduate Student Funding

- Awards to institutions for the purpose of graduate student funding:
  - CyberCorps: Scholarship for Service
  - National Science Foundation Research Traineeship Program
  - Robert Noyce Teacher Scholarship Program

# Information for Postdocs

- NSF has programs that fund postdocs directly or indirectly

[http://nsf.gov/funding/education.jsp?fund\\_type=3](http://nsf.gov/funding/education.jsp?fund_type=3)

- Each postdoc program has specific goals.
- Read the solicitation to see whether your field and circumstances fit a specific postdoc program.

# Postdoctoral Fellowship Programs

- Atmospheric and Geospace Sciences Postdoctoral Research Fellowships
- Mathematical Sciences Postdoctoral Research Fellowships
- NSF Astronomy and Astrophysics Postdoctoral Fellowships
- NSF Earth Sciences Postdoctoral Fellowships
- Postdoctoral Research Fellowships in Biology
- SBE Postdoctoral Research Fellowships
- ASEE/NSF Corporate Postdoctoral Fellowship for Engineers
- Intelligence Community (IC) Postdoctoral Research Fellowship Program

# Information for Junior Faculty

- Faculty Early Career Program (CAREER)  
<http://www.nsf.gov/pubs/2015/nsf15555/nsf15555.pdf>
- Involves excellent research, education, and the integration of research and education
- Requires doctoral degree in NSF-supported field, tenure-track (or equivalent) Assistant Professor
- Applications reviewed in research panels
- Provides support for 5 years of about \$400K-\$500K, depending on directorate

QUESTIONS?

# My Experience and Perspective on NSF Funding

Prof. Staci L. Simonich

Environmental & Molecular Toxicology and Department of Chemistry

College of Agricultural Sciences

Oregon State University





# My Record of NSF Funding

- Continuous NSF funding in Atmospheric Chemistry since 2003
- NSF funding started with CAREER as a new Assistant Professor (second submission) after having spent 6 years working in the consumer product industry
- NSF funding level has been approximately \$100,000/year (total costs)
- With each new grant I have requested supplemental funding (up to 20%) of original grant to start a new or next line of research (including new collaborators) for the next proposal
- I have always included international collaboration and students in my proposals

# My Observations on NSF Funding

- Less preliminary data is needed compared to NIEHS if the idea is novel, sound, and doable in the timeframe and funding requested
- Avoid research questions and wording that “sound like” USEPA, NIH, etc.
- NSF likes to fund graduate and undergraduate students
- Funding is less about who you know than your promise and research idea
- Do not take “Broader Impacts” lightly and seek knowledgeable collaborators to implement and measure Broader Impacts
- Letters of support from key collaborators are essential
- Communicate with (and meet) your program officer
- International collaboration is encouraged (although international collaborator may not be funded)

• Consider requesting supplemental funds after year 1

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- Try, try again....after talking with program officer

# Advice on the NSF Proposal Process

*David Kaeli*

*Dept. of Electrical and Computer Engineering*

*Northeastern University*

*Boston, MA*

*kaeli@ece.neu.edu*

# My Record of NSF Funding

- Continuous NSF funding from CISE/ENG since 1995 (24 grants)
- NSF funding started with CAREER as a new Assistant Professor
- Research thrust lead in a 10-year NSF Engineering Research Center (CENSSIS)
- Presently serve as PI or co-PI on 11 active NSF grants
- I am the PI on an NSF REU Site targeting Data Driven Discovery
- I am the PI on an NSF I/UCRC Planning Grant
- I have received multiple major research instrumentation (MRI) grants
- I have been funded by CISE, ENG, CHE, DGE and DUE

# Dave's top 10 ways to increase your chances of receiving NSF funding

10. Make sure you are submitting to the **right** program!
9. Consider **interdisciplinary** programs – exciting research is many times at the boundaries
8. Avoid recycling old proposals - **learn** from rejects, but start **afresh**
7. Avoid **cramming** too many ideas into a single proposal
6. Submit **multiple** strong proposals each year – you have to be both **good** and **lucky** to be funded

# Dave's top 10 ways to increase your chances of receiving NSF funding

5. Read **successful** NSF proposals from your colleagues
4. Clearly identify the “**Intellectual Merit**” early in your proposal
3. Develop a real “**Broader Impacts**” plan that includes tangible elements of **broadening participation and education**
2. Submit your **CAREER proposal** as many times as permitted - hopefully you receive it early on 😊
1. **Volunteer** to serve on an NSF panel – see the process from the other side