

# Tips & Tricks for Applying to the NSF Graduate Research Fellowship Program

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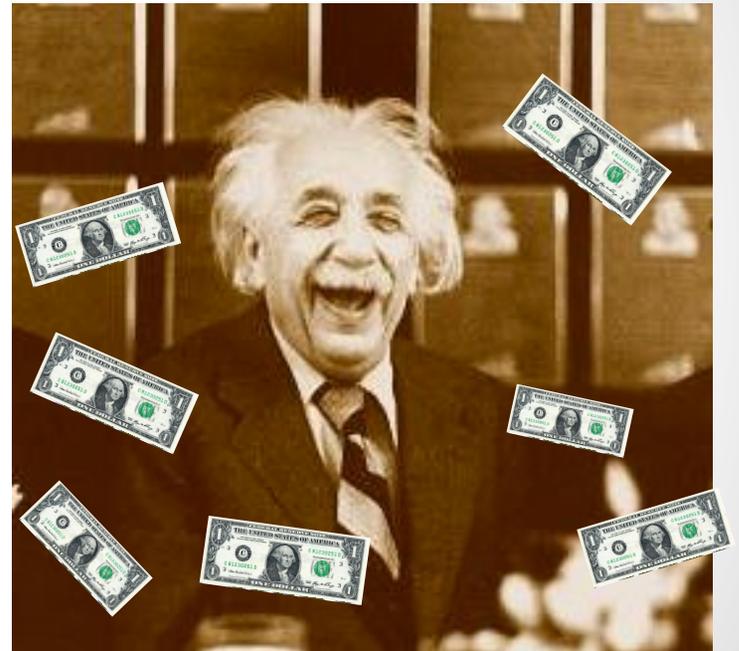
Math 589 - October 2, 2017

# Main Questions

- Why apply?
- Who can apply?
- What is needed to submit an application?
- How can you maximize your chances of being selected?

# Benefits of the NSF GRFP

- 5-year fellowship with 3 years of funding
- Generous stipend
  - \$34,000 Stipend per year
  - \$12,000 Educational allowance to institution
- Tuition waiver
- Travel allowance
- Family leave



# GRFP Unique Features

- **Flexible:** choice of project, advisor & program
- **Unrestrictive:** No service requirement
- Access to supercomputing
- Professional development opportunities



*The IBM Blue Gene/P supercomputer  
"Intrepid" at Argonne National Laboratory*

# Professional Development Opportunities

- GROW – Research abroad in a partner institution (South America, European countries, Asia...)
- GRIP – Internship in a federal institution (Department of Homeland Security, USDA, Office of Naval Research, FBI...)
- Networking events with other fellows

# Benefits even if you are not selected

- Honorable mention
- NSF Funds ~20% of all federally supported basic research conducted by America's colleges and universities
  - *good experience for learning how to write grants*
- Can help you focus your research ideas on paper

**2010 -2016: 2,000 fellowships/year**  
**2016: ~16,800 Applications**  
**~12% success rate**

# Who can apply?

- U.S. citizens, nationals, and permanent residents
- Early-career: undergraduate & graduate students
  - First-year graduate students
  - Second-year graduate students who have completed less than 12 months of graduate study by August
- Pursuing research-based MS or PhD
- Science and Engineering
- Enrolled in accredited institution in US by Fall

*Only 1 time in graduate  
School, in 1<sup>st</sup> or 2<sup>nd</sup> year*

# Timeline

**October 24:** Computer & Information Science and Engineering,  
Engineering

**October 26:** Social Sciences, STEM Education

**October 27:** Chemistry Physics, Math

**November 2:** reference letters due

→ Early April - Awards Announced

→ Early May - Fellows Acceptance Deadline

# What do you need to submit an application?

1. Personal information, education & work experience, proposed field of study, academic honors, publications
1. Personal, Relevant Background, & Future Goals Statement (3 pages)
2. Graduate Research Statement (2 pages)
3. Transcripts (uploaded electronically)
4. Minimum 3 and up to 5 letters of recommendation

**Start as early as possible!**  
Ask your friends, family, colleagues, and professors to read and comment on your statements.

# Personal, Relevant Background, and Future Goals Statement

“NSF Fellows are expected to become **globally engaged knowledge experts and leaders** who can contribute significantly to research, education, and innovation in science and engineering.

The purpose of the statement is to **demonstrate your potential** for **STEM research with broad societal impacts.**”

**Personal & Professional Experiences** motivating you to pursue a STEM career and your preparation for it.

- *What use have you made of the resources available to you?*

**Previous research experiences**

**Career aspirations and goals**

- *How will grad school prepare you for this career?*

# Research Statement

- Describe your Research Plan
- Motivate research question(s)
- Demonstrate understanding of the research question(s) and methods for addressing them (*include citations*)
- Communicate original research idea and approach

**TRANSFORMATIVE**

**Be sure to include sections explaining both intellectual merit and broader impacts.**

Maximizing your chances  
of being selected  
...



# GRFP Goals

- To select, recognize, and financially support individuals who have **demonstrated the potential** to be **high achieving scientists** and engineers, early in their careers.
- To **broaden participation** in science and engineering of underrepresented groups, including women, minorities, persons with disabilities, and veterans.

Source: Dr. Joerg Schlatter, NSF Program Officer,  
lecture at University of Illinois-Chicago,

# Merit Review Criteria

## INTELLECTUAL MERIT

- How important is the proposed activity to **advancing knowledge** within its own field or across different fields?

AND

## BROADER IMPACTS

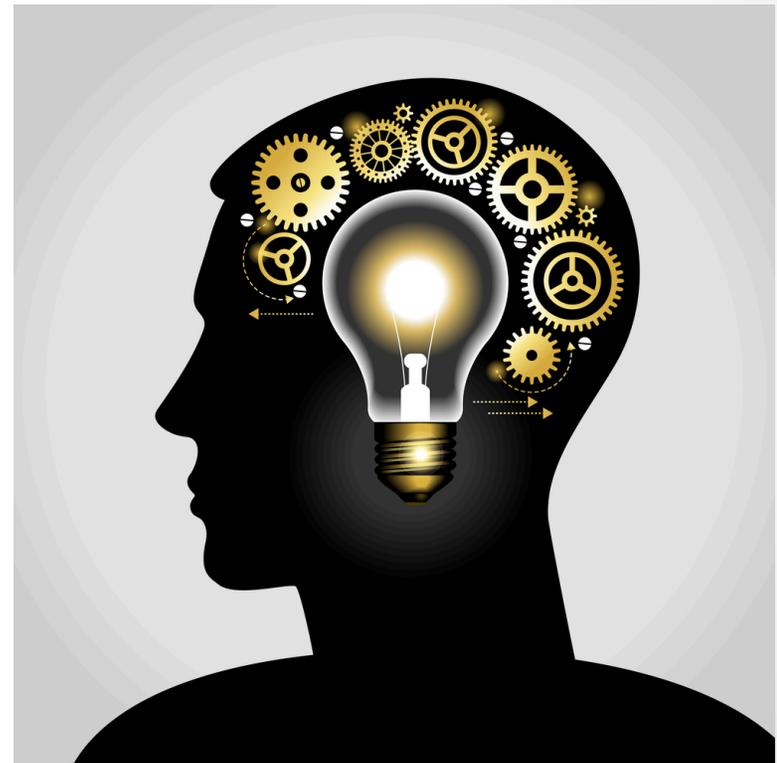
- How well does the proposed activity **benefit society** or advance desired societal outcomes?

**Separate sections for Intellectual Merit and Broader Impacts.**  
Provide the criteria to reviewers.

# Intellectual Merit

Demonstrated intellectual ability and other accepted requisites for scholarly scientific study, such as the ability to:

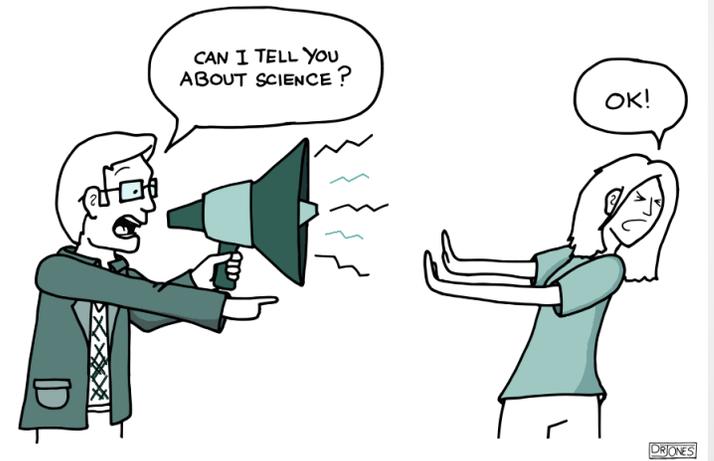
- Plan and conduct research
- Work as a member of a team as well as independently
- Interpret and communicate research



# Broader Impacts

Societal benefits include:

- Impact of project or individual student on society
- Increased participation of underrepresented groups
- Improved STEM education
- Impact on society : Increased public scientific literacy; increased public engagement with science and technology
- Community outreach: science clubs, radio, TV, newspaper
- Potential to impact diverse, globally competitive workforce
- Increased partnerships between academia, industry and others
- Leadership potential



# Examples of Broader Impacts

- **Student at University of Chicago:** developed a program where high-school students visit a lab to learn that research is often collaborative and a lot of it is conducted by graduate students, not just professors
- **Student at University of Chicago:** His research was on microbiology, but he founded an institute on the South Side of Chicago for high-school students to learn about science
- **Psychology student at Northwestern:** When he found out that about 40% of psychology studies were not replicable, he started looking at methods to improve psychology studies
- **Geology student at Northwestern:** She often goes to Greenland to study climate change and tries to find ways to educate the public about climate change

# Examples of Broader Impacts

- **Northwestern student:** Is interested in how we communicate science to the public. Is a member of the ComSciCon board and started a podcast called PhDrinking where she invited a graduate student for an informal podcast about their research.
- **University of Chicago mathematics student:** Talked about initiatives with the Association for Women in Mathematics (AWM)
- **Ecology student at UIC:** His disability prevents him from being a field ecologist, but he does complex modeling to study the evolution of species.

# Some examples from my application

## **Personal Statement**

- International background and dual interest in math and international relations
- Experience as a woman in mathematics
- Two research experiences as an undergraduate
- Involvement with the Malta Conferences Foundation
- Organizing an interfaith event after the Paris, Beirut, and Baghdad terrorist attacks in November 2016
- Overcoming challenges

## **Research proposal**

- Using game theory to study what factors contribute to the success of science diplomacy in the Middle East
- Example of the Malta Conferences (the only platform in the world where scientists from 16 Middle East countries can meet face-to-face with 5 Nobel Laureates and develop collaborations and friendships)
- Potential for policy impacts.

# Additional resources

- Program solicitation (a.k.a. your Bible)  
<https://www.nsf.gov/pubs/2016/nsf16588/nsf16588.htm#toc>
- Blog post from an NSF fellow with tips  
<http://www.alexhunterlang.com/nsf-fellowship>
- Experienced GRFP resource people

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Good luck!