What is the NSF GRFP?
The National Science Foundation

• Federal agency created in 1950 to “to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense”

• >$7 billion annual budget for research and education in Science, Technology, Engineering and Math (STEM) disciplines- all fields but clinical biomedical (NIH)
NSF Graduate Research Fellowship Program

• Initiated in 1952 - oldest NSF program

• Goals are to:
  – select, recognize, and financially support individuals early in their careers with the **demonstrated potential** to be high achieving scientists and engineers.
  – **Broaden participation** in science and engineering of underrepresented groups, including women, minorities, persons with disabilities and veterans.

• NSF expects to award 1,000 compared to 2,000 (if implemented)
  – success rate increased from 13% to 16% from 2016 to 2017
  – 50% reduction in the number of new fellowship awards
Program Benefits

- **Three years of support** over five year graduate enrollment period
- **$34,000** annual cost of living stipend
  - Often supplemented by PI, ask your department about this
- **$12,000 cost-of-education allowance** paid to institution (tuition typically waived)
- **International opportunities**—fellows will receive announcements about opportunities to apply for GRFP support for their participation in international opportunities
- **TeraGrid supercomputer access** for both fellows and honorable mentions
Benefits Continued

- Clarify your educational goals
- Provide research independence
- Enhance your career (very prestigious)
- Portable to graduate institutions in US or abroad
- Flexible- your choice of project, advisor, department
- No service requirement
GRFP Eligibility

- U.S. citizens and permanent residents
- Senior undergrad or 1st or 2nd year graduate students
  - Can only apply once as a grad student
- Pursuing research-based MS and PhD
- NSF supported fields
- Plan to enroll in accredited US institution

Academic Levels

1: Seniors/baccalaureates; no graduate study
2: First-year graduate students
3: Second-year graduate students
  - ≤ 12 months of graduate study by August 1, 2018
4: >12 months graduate study (Extenuating circumstance)
  - Interruption in graduate study of 2+ years
What is NSF looking for in successful applicants?

Individuals who demonstrate potential to complete graduate degree programs and become future leaders in disciplines relevant to NSF’s mission.

GRFP Supported Disciplines

- Chemistry
- Computer and Information Science and Engineering
- Engineering
- Geosciences
- Life Sciences
- Mathematical Sciences
- Physics and Astronomy
- Psychology
- Social Sciences
- Science Education
Reviewer Criteria & Finding Success
GRFP Application

- Personal profile, education, and work experience
  - Load this up, this is the first part reviewers see
  - This heavily influences how reviewers examine the rest of your packet
- Personal, Relevant Background and Future Goals statement (3 pages)
- Graduate research statement (2 pages)
- Three letters of reference
  - Pick people that will write you an excellent letter
  - Help them prepare the letters
- Transcripts

- Extenuating circumstance essay
Who will read your application?

- Applications are assigned to panels based on the primary field of study designated by applicant
- Applications reviewed in disciplinary virtual panels
- Online review of applications by panelists
- Virtual panel review
• Two National Science Board-approved criteria
  – Intellectual Merit
  – Broader Impacts
NSF Intellectual Merit

• Potential to advance knowledge within field and across fields based on a holistic analysis of the complete application

• Considerations include:
  – Ability to plan and conduct research (include in letter and personal statement)
  – Ability to work independently and as a member of a team (include in letter and personal statement)
  – Proposed activities are well-reasoned and based on sound rationale
  – Interpret and communicate research
Intellectual Merit Assessment

• Academic performance
  – Grades, curricula, etc.
• Awards/honors
• Research experience/other professional experience
• Communication skills
• Independence/creativity
• Publications/presentations
• Research plan
• Reference letters
NSF Broader Impacts

Contributions and achievements that have broader impacts on society, including:

- Enhance STEM education at all levels (K-16)
- Integrate research and education
- Enhance public scientific literacy of society - blogs, newspapers, radio, TV, etc.
- Enhance participation of all citizens, esp. women, underrepresented minorities, persons with disabilities and veterans
- Share your science with the broader public – community outreach
- Participation in museums, national parks,
- Participation in the global STEM enterprise
Broader Impacts Assessment

- Prior accomplishments
- Future plans
- Individual experiences
- Integration of research and education
- Potential to reach diverse audiences
- Impact on society and connectivity
- Community outreach
- Leadership potential
<table>
<thead>
<tr>
<th>Intellectual Merit Rating *</th>
<th>○ Excellent ○ Very Good ○ Good ○ Fair ○ Poor</th>
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<th>Summary Statement *</th>
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<th>Overall Score *</th>
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<td>Score must be a whole integer between 1 – 50</td>
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### Quality Groups (QG) Ratings

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<th>Quality Groups (QG)</th>
<th>Ratings (E – P)</th>
<th>Score (1-50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>QG 1: Highly Meritorious</strong>&lt;br&gt;Recommended for Fellowship</td>
<td>Excellent</td>
<td>50 - 40</td>
</tr>
<tr>
<td><strong>QG 2: Meritorious</strong>&lt;br&gt;Recommended for Fellowship&lt;br&gt;/Honorable Mention</td>
<td>Very Good</td>
<td>39 - 30</td>
</tr>
<tr>
<td><strong>QG 3: Not Recommended</strong>&lt;br&gt;Not eligible to receive Fellowships/Honorable Mention</td>
<td>Good</td>
<td>29 - 20</td>
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<td></td>
<td>Fair</td>
<td>19 – 10</td>
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<tr>
<td></td>
<td>Poor</td>
<td>9 – 1</td>
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Charge to Panels

• Maintain integrity of the panel review process
  – Merit review criteria
  – Conflict-of-interests rules
  – Confidentiality
• Reconcile differences early
• Thorough and efficient review
• Provide feedback to enhance program effectiveness
Application Review Process

Virtual Panel Activities

- Day 1 Panel Deliberations
  - Day 1 Ranking Report
  - Discrepancies resolution
  - Quality Group placement
  - Panelists review and revise evaluations, if necessary

- Day 2 Panel Deliberations
  - Day 2 Ranking Report

- Final Ranking Report produced
Reviewers are very tired at this time of year. Classes just ended. We take a week or two to “catch up”. It's now the week of Christmas and I have to read ~30 of these applications. How much time do you think I will devote to each application? Make it easy for me to read your application.
How to Apply
GRFP Application

- Personal profile, education, and work experience
- Personal, Relevant Background and Future Goals statement (3 pages)
- Graduate research statement (2 pages)
- Three letters of reference
- Transcripts

- Extenuating circumstance essay
Formatting Instructions

- Required font and size: Times New Roman 12
- References, footnotes and figure captions may be Times New Roman 10
- Required margins: 1” margins all sides
- Page formatting: Standard 8.5” x 11” paper; single spaced
Planning Timeline - September through First Week of October

- Discuss the grant with your Graduate Advisor and/or Mentor and start clarifying your ideas (If not applying this year, go ahead and start preparing your personal statement and research statement now)

- Personal Profile - Table within Fastlane

- Education and Work Experience - Tables within Fastlane

- Planned Graduate Program - Table within Fastlane

- Request all transcripts - Load to Fastlane upon receipt

- Obtain agreement from three reference writers
  - Give them a draft of your goals & research statement, CV, and instructions for reference writers
  - Draft a version of the letter for them, this helps you receive an amazing letter
  - Once agreement is confirmed, input contact information into Fastlane
  - Deadline for reference writers is November 2, 5 pm

- Personal, Relevant Background and Future Goals statement - (3 pages)
Planning Timeline -
Second Week of October - Deadline

- Finalize graduate research statement - 2 pages
- Print a draft version of all forms, narrative (with references) and have your Graduate Advisor/Mentor review
- Print out a hard copy and begin to proof
- Enlist proofreading help from peers, advisors, family
- Proofread it again and find someone who hasn’t seen it before to proof
- Submit!!
- Remind reference writers to submit by deadline
Writing the essays

Organize your narrative
• Make a list of all the information that makes you a good candidate

• List all of your research and project experiences

• List all your extra-curricular activities, particularly those involving STEM

• Make a rough draft of the argument of your application

• Allocate each idea on your list to an element of your application; that is one of the essays or to one of the letters of recommendation
Writing Style Counts

• Write in the active voice
  (Whether you use 1st or 3rd person depends on your field)

• Avoid technical jargon when possible

• Use proper grammar

• Avoid phrases like....It is obvious. It is apparent. As previously stated.

• Take out every “very,” “pretty,” actually in your narrative.
Personal, Relevant Background and Future Goals statement (3 pages)

• **Introduction & Future Goals**
  • Tell them about yourself
    • Why did you study what you did as an undergrad
    • Why are you getting a PhD
    • What are your long term goals
      • Not only career but scientific
      • What problems will you be addressing in your career

• **Intellectual Merit**
  • Tell them your research experiences, what you discovered, and put your results in context (who cares?)
  • Describe what intellectual merit you will provide in the future

• **Broader Impacts**
  • Tell them activities you have already participated in
  • Tell them what activities you plan to do during your PhD to meet this criteria
  • Tell them what activities you will do throughout your career
    • Integrate research and education
    • Increase diversity in STEM
    • Inform community about research (everyone pays for this)
Research Statement (2 Pages)
Complete in 3 years or so (Example)

- **Background & Hypothesis (1/2 page)**
  - Use a long-standing, important problem with no solution as your motivation
  - Present a hypothesis/technology of how to solve this problem
  - Use results from existing literature or your research to support your hypothesis
  - Give a brief overview of how you will test it, what the anticipated results are, and how it will impact society (intellectual merit and broader impacts)
  - Include a figure/schematic/cartoon that shows what you will be testing

- **Objectives (1 paragraph)**
  - Provide a list of objectives (THIS IS NOT A LIST OF EXPERIMENTS)
  - This is 2 or 3 objectives to test your hypothesis

- **Experimental Design (1 page)**
  - Describe in detail what experiments you will be perform to achieve your objectives and test your hypothesis
  - Provide another small figure if possible.
  - This is not a materials and methods section of a paper

- **Summary (1 short paragraph)**
  - Summarize what your anticipated results will be, the intellectual merit developed and the broader impacts of your research.

- **References** (you are out of room now, bunch together in paragraph format)
How to prepare a proposal

~ Educate yourself on a topic or chose a topic you are very familiar with
  ~ Read lots of literature
~ Develop a hypothesis based on holes or data in literature or your own results
~ While doing above, think about the potential impact if your hypothesis/hypotheses is/are correct
~ Research the literature and make sure you hypotheses have not been tested
~ Brainstorm on exactly what experiments would need to be performed, with proper controls, to test your hypothesis
  ~ Outline on paper what figures would be produced, be very detailed
  ~ Determine what techniques will let you measure what you want to measure and what the flaws are
~ You now have the basic parts needed to write your proposal
Resources

University of Delaware – GRFP Resource Hub
LINK

University of Missouri- GRFP Essay Insights
http://grfpessayinsights.missouri.edu/resources.php

Leigh Botner – lbotner@udel.edu

UD Recipients

Hannah Clipp – hclipp@udel.edu
Talisa Carter – tjcarter@udel.edu
Rebekah Houser- rlhouser@udel.edu
Advice from a Previous Recipient

Margot Farnham (Biomedical Engineering)