NSF GRADUATE RESEARCH FELLOWSHIP

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How to write a winning fellowship
Only 5 minutes to convince a tired reviewer, who’s not an expert in your field, that your proposal is worth funding.
WHY SHOULD YOU APPLY?

- Fully funded – by a nicely sized stipend + tuition
- Develops writing skills – important skill set required during and after PhD
- Develops skills planning a series of experiments
- Provides best opportunity to attend #1 graduate school choice
“NSF funds the researcher, not the research”

- Former NSF Reviewer

Translation: They look at your potential to be a researcher
Personal Statement/Experience/Future Goals

- Opening memorable paragraph demonstrating your potential to have a long lasting impression on your field

- Why should they fund you specifically?
  - Distinguish yourself from 20,000 other applicants (most will have a strong GPA)

- Summarize all your research/internship experiences
  - Be detailed and specific (Intellectual Merit)
  - Examples of leadership, teamwork, outreach, dissemination

- How will receiving the fellowship contribute to your career goals?
  - What are your future career goals?
Previous Research: Key Points

- Why was the research important (Intellectual Merit)?
- What were the Broader Impacts?
  - Within your field
  - Did you mentor anyone, why does the average person care about your work
- What did you set out to accomplish?
- What was your role?
- What did you learn (overcome any obstacles)?
- Provide examples of teamwork and independent work
- List achievements, valuable contributions, dissemination of results...
REQUIRED MATERIALS:

Proposed Research

- SHORT introduction and background – only to show why your work is significant and/or novel
- Hypothesis
- Objectives
- Research Plan/methodology
  - Make sure plan is feasible (time, resources...)
- Intellectual Merit
- Broader Impacts
  - How will your research contribute to the “big picture” outside of academia
  - Inclusion of underrepresented students
- Contingency
- NO JARGON!
Letters of Recommendation

- **Who to ask?**
  - Research advisor (past and present)
  - Industry/internship – if supervisor has a PhD. If not, please see next page.
  - New to UF?
    - 2:1 vs. 1:2
    - Aunt Ginny?

- **Title?**
  - Pedigree – MIT is viewed positively
  - Dean, Department Chair, Professor
  - Assistant Professor
Letters of Recommendation

What should they say?

- Potential to conduct research is outstanding
- Intellectual Merit of research
  - Novelty
  - Impact on the field
- Broader Impacts
  - Application to the field
  - Incorporation of underrepresented students
KNOW YOUR AUDIENCE!
A reviewer has 40 applications!

Each application has 3 reviewers
- Given your essays, transcripts, letters of recommendation, and application forms

Rated based on “Intellectual Merit” and “Broader Impacts”
- Review Criteria listed for each on NSF’s website
STAND OUT!

- Clearly organized – easy to find key information
  - Title the background, plan, methods, intellectual merit, broader impacts...

- Use **bold**, *italics*, and *underline* for key information
  - Goals, hypothesis, broader impacts...

- Use pictures!
  - Worth 1000 words
  - Schematics explain a lot while taking up little room
<table>
<thead>
<tr>
<th>Intellectual Merit</th>
<th>Broader Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to plan/conduct research</td>
<td>Integrate research and education to all levels, broad context</td>
</tr>
<tr>
<td>To work as a member of team as well as independently</td>
<td>Encourage diversity, broaden opportunities in science/research</td>
</tr>
<tr>
<td>To interpret and communicate research findings</td>
<td>Enhance scientific understanding</td>
</tr>
<tr>
<td></td>
<td>Benefit society</td>
</tr>
</tbody>
</table>
INTELLECTUAL MERIT

Research/Internship experience

1. What did you do?
2. What did you learn?
3. Did you work in a team?
4. Did you conduct independent work?
5. Did you mentor anyone during the work?
6. Did you publish or disseminate?
7. Did anything fail where you had to overcome any adversity?
BROADER IMPACTS

- Mentor undergrad and graduate students
  - Assistance in lab, help them develop posters...

- Be a guest lecturer for your college/department or local community colleges

- Work with summer camps that tour campus and lead lab activities and lectures that explain your research

- Incorporate interdisciplinary studies to widen the impact
BROADER IMPACTS (CONT’D)

- Develop teaching materials regarding your research
  - Work with a professor for a specific class

- Demonstrate link between your research and how it benefits society
  - Specific examples: health benefits, social aid, economic advantage...

- Publish results!
  - Be specific

- Present at conferences!
  - Be specific

"Results will be disseminated in the literature"
GETTING STARTED

- Understand what application materials are required

- Set a timeline for accomplishing small tasks one at a time
  - Start early!
  - Different disciplines have different deadlines

- Keep NSF’s rating sheet close by when writing your essays

- Give copies of essays to professors, peers, friends, family, etc., to proofread – as many people as possible!
TIME LINE

- August
  - Outline the personal essay
    - decide how the paper will flow and find your style
  - choose a research topic
  - contact recommendation letter writers
- September
  - write your first draft (try to 25-50% more than needed)
  - ask friends for comments and revise multiple times a week
  - Pay attention to Intellectual merit and Broader Impacts
- October
  - make final cuts to the paper
  - begin to scrutinize the wording in every sentence
OUTLINE

- Try to figure out your story
  - Reason you became an engineer
  - Struggles you have had along the way
  - What you want to do after you get that PhD

- make a list of all your accomplishments
  - awards
  - grades
  - presentations
  - papers
  - metals from sports
  - etc. be exhaustive (you never know how we will use something)

- make a list of all your
  - mentorship experiences
  - research experiences (be thorough here)
Write multiple versions of your opening paragraph with various themes

- The overachiever
  - These are all the things I have done, and the trend will continue

- The dreamer
  - I’ve wanted to do ‘whatever’ all my life because of ‘some event’

- The struggle is real
  - I’ve been through ‘some life changing event’ that gave you ‘some outlook’

- Uplifting motivation
  - ‘Something’ could be used to inspire an audience of incoming freshmen

- Pity party
  - I’ve had a hard time getting to this point, but I’ve still managed to kill it
COMMON POSITIVE REVIEWS

- “Demonstrates ability to plan and conduct research”
- “Well written proposal with clear hypothesis”
- “Potential to have a real impact”
- “Publications and presentations show effective communication”
- “Original research idea”
- “Demonstrates leadership ability”
- “Shows desire and ability to communicate science through outreach activities”
COMMON NEGATIVE REVIEWS

- “Benefit to society not well expressed”
- “Methods and research plan are not clearly explained”
- “Unclear of the significance of this work”
- “No mention of how research will be disseminated to the public”
- “Limited research experience”
- “Research did not result in any presentations or scientific publications”
- “Lacks Broader Impacts”