

NSF GRADUATE RESEARCH FELLOWSHIP

Dr. David W. Mazyck
Professor
Environmental Engineering
Sciences

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**

REQUIRED MATERIALS:

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?

REQUIRED MATERIALS:

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!**

REQUIRED MATERIALS:

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

REQUIRED MATERIALS:

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!

THE REVIEW PROCESS

- 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



DIRECTLY FROM RATING SHEET:

Intellectual Merit

- Ability to plan/conduct research
- To work as a member of team as well as independently
- To interpret and communicate research findings

Broader Impacts

- Integrate research and education to all levels, broad context
- Encourage diversity, broaden opportunities in science/research
- Enhance scientific understanding
- Benefit society

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?

7 QUESTIONS

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

EXAMPLES

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



EXAMPLES

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)

OPENER

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”**