

# 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
- Develops skills in communicating your research
- Develops skills planning a series of experiments
- Provides understanding as to where the gaps in knowledge are in your field
- Makes writing your dissertation proposal a LOT easier

# “NSF funds the researcher, not the research”

-Former NSF Reviewer

Translation: They look at your potential to be a researcher

- Limited data – OK!
- First-year graduate student – OK!
- Change your research topic – OK!

# REQUIRED MATERIALS:

## Personal Statement, Previous Research, Future Goals (3 pages)

### ■ Opening Paragraph

- What will set you apart from 20,000 applicants
- Distance travelled
  - How did you get to where you are?
  - Tell a story of how you developed your passion, skills as a researcher, a student, research interest...
- Show your passion!

# REQUIRED MATERIALS:

## Personal Statement, Previous Research, Future Goals (3 pages)

### ■ Previous Experience

- (Undergraduate Research, Internship)
  - What did you work on
  - Intellectual merit, Broader Impact
  - Independent work vs Team (leadership, mentoring)
  - What if any obstacles did you overcome
- Overall what did you learn and how you will apply lessons learned in the future
- Did you publish, present, disseminate your work

# REQUIRED MATERIALS:

## Personal Statement, Previous Research, Future Goals (3 pages)

### ■ Future goals

- Brief glimpse into the first few years post PhD
- Be specific!!
- State why one path or another
- How will receiving the fellowship contribute to your career goals?

# REQUIRED MATERIALS:

## Personal Statement, Previous Research, Future Goals (3 pages)

- How did you get to where you are?
- Tell a story of how you developed your passion, skills as a researcher, a student, research interest...
- List achievements, valuable contributions, communication of results...
- List all applicable experiences
- What did you learn from each experience?
- How will you pay it forward (i.e. mentorship, volunteering)



# REQUIRED MATERIALS:

## Proposed Research (2 Pages)

- **Background**
  - Why is your work is significant?
- **Hypothesis**
  - Scientific Method
- **Objectives**
  - What do you plan to accomplish
- **Work plan**
  - Detailed and organized
- **Intellectual merit**
- **Broader impacts**

# REQUIRED MATERIALS:

## Proposed Research (2 Pages)

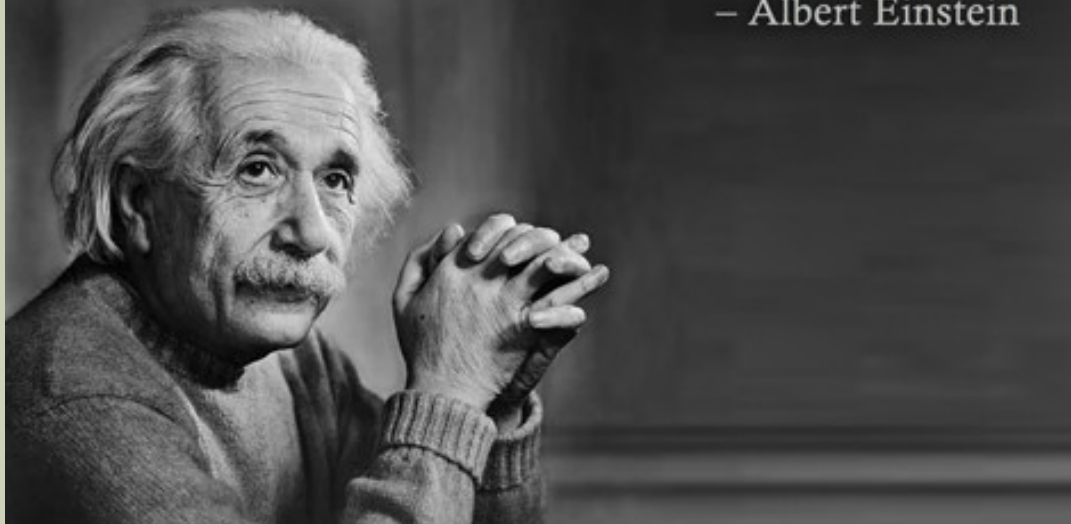
- Make sure plan is feasible (time, resources...)
- How will your research contribute to the “big picture” outside of academia
- Novelty? Impact?
- Contingency
- NO JARGON!

# REQUIRED MATERIALS:

## Proposed Research

If you can't explain it **simply**, you  
don't understand it well enough.

– Albert Einstein



# REQUIRED MATERIALS:

## Letters of Recommendation (3)

- **Potential Candidates**
  - Current or previous research advisor
  - Professor
  - Internship Supervisor\*\*\*
- **Need to understand the student's career goals and objective**
- **Place student in context of others mentored/worked with**
- **Be able to separate the student from the crowd**

# REQUIRED MATERIALS:

## Letters of Recommendation (3)

- Confirm and support the work presented in personal statement and proposed research
- Speak to the research conducted (if applicable)
  - Skills, ability to organize and lead
  - Provide specific examples
- Speak to the teaching assistantship (if applicable)
- Evidence of Intellectual Merit
- Comments on how the student will be successful in graduate research and later academia

# 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

- Explain how your proposal is new and different than others
- Show when your team excelled and list your contribution
- Most important: well written and clear proposal!!!

Shorter ~~amounts of time spent~~  
~~writing and editing~~ sentences  
may deliver ~~disappointing~~  
~~results for business owners~~  
~~whose intent was to be~~ clearer  
~~but their~~ messages. ~~were lost in~~  
~~unnecessary verbiage.~~

EXAMPLES

# ***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**

**KNOW YOUR AUDIENCE!**

# THE REVIEW PROCESS

- Each application has 2 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
- If scores are high enough, reviewed by 3<sup>rd</sup> and final reviewer

# 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

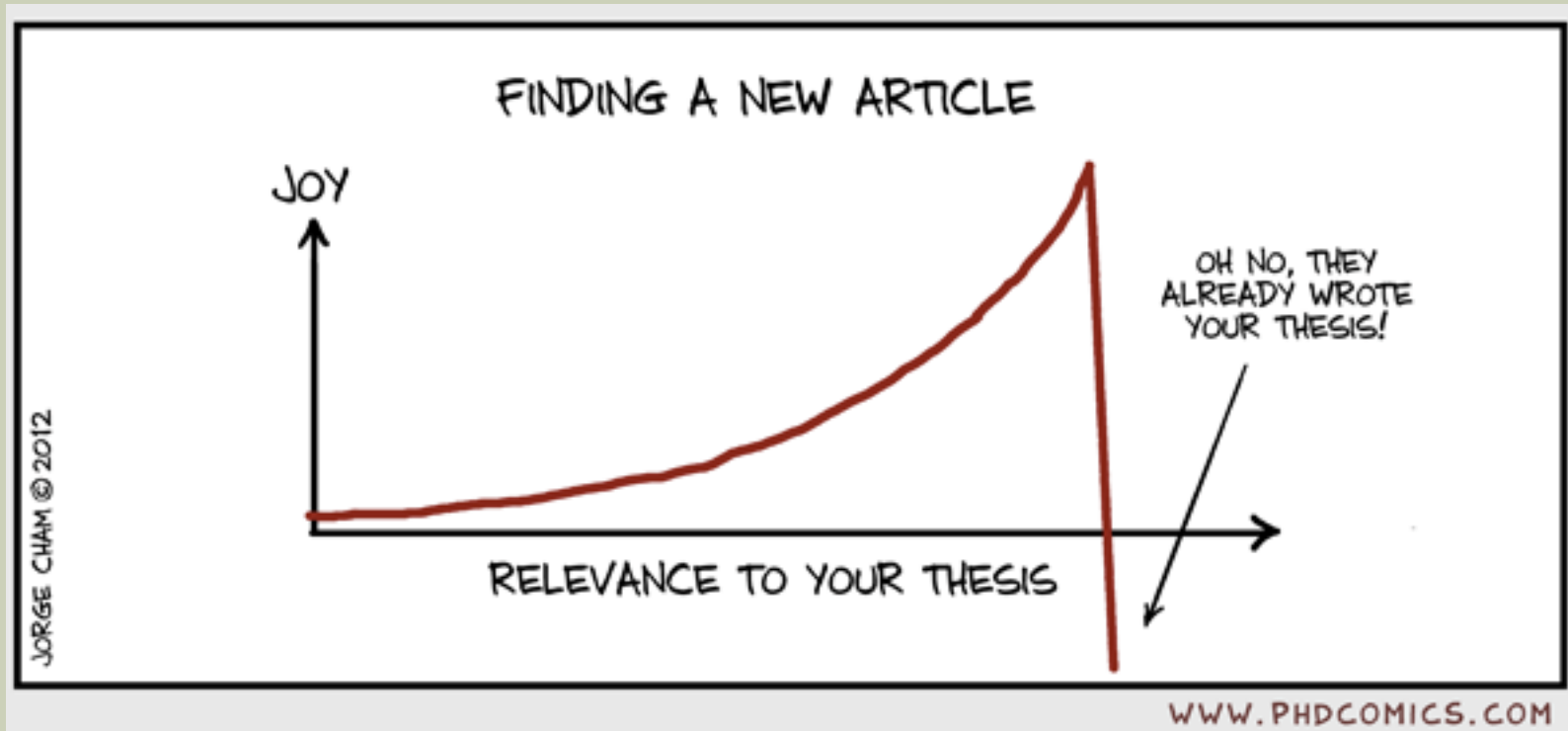


# GETTING STARTED

- 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!

# GETTING STARTED (CONT'D)

- Read... Read... and Read...
  - Important in order to know where the knowledge gaps need to be filled in!



# 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”
- ***“Lacks Broader Impacts”***



# WHAT CAN YOU DO **NOW** TO BETTER YOUR WINNING CHANCES!!

- Undergraduate Research!!!
  - UF McNair Scholar- January 29<sup>th</sup>
    - <http://mcnair.ua.ufl.edu>
  - University Scholars Program- February 12<sup>th</sup>
    - <https://www.eng.ufl.edu/students/programs/undergraduate-research/university-scholars/>
- Mentoring
  - Mentor UF
    - <http://www.leadershipandservice.ufl.edu/programs/mentoruf/>
- Present & Publish your work
  - Department and College Symposiums
  - Regional and National Conferences

# OTHER FELLOWSHIPS

## ■ NASA

- <http://science.nasa.gov/researchers/sara/student-programs/#grad>

## ■ Ford Fellowship

- [http://sites.nationalacademies.org/PGA/FordFellowships/PGA\\_166320](http://sites.nationalacademies.org/PGA/FordFellowships/PGA_166320)

## ■ National Academies of Science

- <http://sites.nationalacademies.org/pga/rap/>

## ■ National Institution of Health

- <https://researchtraining.nih.gov/programs/fellowships>

# ADDITIONAL RESOURCES

- <http://ufdc.ufl.edu/ufirgrants/all>
  - UF's grant repository of winning applications
- <http://guides.uflib.ufl.edu/>
  - UF's videos/slides of past grant workshops
- <http://www.alexhunterlang.com/>
  - Essay examples
- <http://www.rachelcsmith.com/>
  - Essay examples

