Applying for the NSF Graduate Fellowship

A workshop for prospective applicants

September 5, 2019
LSU NSF GRFP workshop team

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Workshop overview

• Basic information on the Fellowship
• How the selection process works
• The ideal candidate for the NSF Graduate Fellowship
• How to prepare the best application
  • Important dates
  • Process details
  • Advice
• Next steps
Basic information on the Fellowship

http://www.nsfgrfp.org/

Fellows receive
Three years of support

$34,000 annual stipend

$12,000 cost-of-education allowance to your school

Your university must exempt you from all tuition and fees!
Eligibility requirements

Applicants must be United States citizens or nationals*, or permanent resident aliens of the United States

*a native resident of a commonwealth or territory of the United States, such as American Samoa, Guam, Puerto Rico, United States Virgin Islands, or the Northern Mariana Islands. It does not refer to a citizen of another country who has applied for United States citizenship.
Eligibility: undergraduate and post-baccalaureate

Individuals may apply

as an **undergraduate senior** or as a **post-baccalaureate**, before beginning graduate training

**Graduate students are limited to only one application to the GRFP**, submitted either in the first or second year of graduate school

**Special circumstances** for breaks in your grad career

*Questions on eligibility: info@nsfgrfp.org*
You are not eligible if

You completed the requirements for any graduate or professional degree by August 1, 2019, unless

• You completed a joint baccalaureate-master's (BS/MS) program and have not completed any further graduate study outside this joint program unless the graduate coursework was required to establish or maintain credentials in a profession such as teaching

• You have had an interruption in graduate study of at least two consecutive years prior to November 1, 2019 and have completed no additional graduate study as of August 1, 2019.
How the selection process works

After submission, your application will be reviewed by a panel of experts, usually professors in your field of study.

The panelists will review your application with respect to two criteria:

- **Intellectual merit**: the potential to advance knowledge

- **Broader impacts**: the potential to benefit society and contribute to the achievement of specific, desired societal outcomes
How the selection process works

After review, applicants are placed in groups indicating their likelihood of being funded
NSF makes final award selections
Awards are announced in the spring (by early April)
The ideal candidate for the NSF Graduate Fellowship

I have taught more than 25 NSF graduate fellows from LSU

Undergraduate GPAs ranged from 3.1 to 4.0
Most completed undergraduate research
All had some form of extracurricular activity
All worked very hard on their applications
   At least 6 drafts of each essay was common

About half the students were funded the subsequent time(s) they applied (use the reviewer comments to improve your next application)
The ideal candidate for the NSF graduate Fellowship

Is a Renaissance scholar
Has fully addressed intellectual merit and broader impacts criteria in their application
Is a reflective practitioner or scholar
   Everyone applying has good grades and excellent personal character; you must set yourself apart from the other applicants
How to Prepare a Successful Application

Due Dates
The Application Process
More Details

Intellectual Merit
Broader Impacts
Due Dates

All applications must be submitted through Research.gov by 5:00 local time (CST for us)
Due Dates

October 21, 2019 (Monday):
   Geosciences
   Life Sciences

October 22, 2019 (Tuesday):
   Computer and Information Science and Engineering
   Engineering
   Materials Research

October 24, 2019 (Thursday):
   Psychology
   Social Sciences
   STEM Education and Learning
Due Dates

October 25, 2019 (Friday):
  Chemistry
  Mathematical Sciences
  Physics and Astronomy

November 1, 2019 (Friday), 5:00 EST!
  Reference letters due for all fields of study
The Application Process

Register online in Research.gov (NSF’s platform for electronic submission of your application)

Input in “the basics” of the application
  Personal information
  Education and other experience
  Field(s) of study
  Graduate school information
  Academic transcripts
The Application Process

3 letters of recommendation from faculty (must be submitted on time)

2 essays:

- Personal, Relevant Background and Future Goals Statement -- 3-page limit
- Graduate Research Statement (proposed research) -- 2-page limit
  References, figures, and citations are included in page limit
Statement Requirements: the weeds

Standard 8.5" x 11" page size
12-point, Times New Roman font or Computer Modem (LaTeX) font. 10-point font may be used for references, footnotes, figure captions and text within figures
1" margins on all sides
Single spaced or greater line spacing
Normal character spacing (no condensing)
Figures in black & white
Images, footnotes, endnotes, and other citations are included in the page limit
For both statements, reviewers will be evaluating your application with these thoughts in mind:

What is the potential for the proposed activity to
- Advance knowledge and understanding within its own field or across different fields (Intellectual Merit);
- Benefit society or advance desired societal outcomes (Broader Impacts)?

To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
For both statements, reviewers will be evaluating your application with these thoughts in mind:

Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?

How well qualified is the individual, team, or organization to conduct the proposed activities?

Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?
The potential of the applicant to advance knowledge based on a holistic analysis of the complete application, including:

- The personal, relevant background, future goals statement
- Graduate research plan statement
- Strength of the academic record
- Publication/presentations
- References

Panelists will **not** consider your GRE score!
Broader Impacts Criterion

Broader impacts may be accomplished through the research itself through the activities that are directly related to specific research projects through activities that are supported by, but are complementary to, the project.

NSF values the advancement of scientific knowledge and activities that contribute to achieving societally relevant outcomes.
Broader Impacts Criterion

The potential of the applicant for future broader impacts as indicated by

- Personal experiences
- Professional experiences
- Educational experiences
- Future plans

See the National Alliance for Broader Impacts (NABI) for more details, https://broaderimpacts.net

Short NABI report on tips for developing BI in proposals at https://osf.io/jveb7/
Broader Impacts: societally relevant outcomes

full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM);

improved STEM education and educator development at any level

increased public scientific literacy and public engagement with science and technology

improved well-being of individuals in society
Broader Impacts: societally relevant outcomes

development of a diverse, globally competitive STEM workforce

increased partnerships between academia, industry, and others

improved national security

increased economic competitiveness of the US

and enhanced infrastructure for research and education.
Advice: be a reflective practitioner

• We tend to focus on the what (concrete experience)
• Go beyond “the what” in both your statements
• Answer: What, so what, now what?
  • What: describe your experience
  • So what: Talk about what you learned as a result (as a scholar and a person)
  • Now what: Be explicit about how your experience and what you learned from it brings you to where you are now, and where you plan to go
Reflection prompts for the proposed research statement

<table>
<thead>
<tr>
<th>Reflection Prompt</th>
<th>Topic Statements or Ideas to Address Prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What?</strong></td>
<td>• The objectives of this research are...</td>
</tr>
<tr>
<td></td>
<td>• The hypothesis of this project is...</td>
</tr>
<tr>
<td><strong>So what?</strong></td>
<td>• The anticipated results of this study are...</td>
</tr>
<tr>
<td></td>
<td>• I believe that my hypothesis will be proved true because...</td>
</tr>
<tr>
<td><strong>Now what?</strong></td>
<td>• In the proposed project, I anticipate potential problems with xxx (measurement limitations, interactions, etc.). If I encounter these problems, I will (explain how you would solve the problem).</td>
</tr>
<tr>
<td></td>
<td>• The implication of this study is...</td>
</tr>
</tbody>
</table>
Reflection prompts for the personal, relevant background, and future goals statement

<table>
<thead>
<tr>
<th>Reflection Prompt</th>
<th>Topic Statements or Ideas to Address Prompts</th>
</tr>
</thead>
</table>
| **What?**         | • Tell the story of how you became interested in your discipline.  
                   | • I conducted research on (describe)         |
| **So what?**      | • Through my experience, I learned...(state what you learned about research, practice, yourself, and/or society)  
                   | • Based on these experiences, my next step is... |
| **Now what?**     | • My research philosophy is...  
                   | • My future plans are and they are critical to my discipline and/or society because... |
Advice: How to prepare the best application

Start NOW

Choose your recommendation letter writers carefully
Provide a full resume, copies of your essays, and directions (see next slide) to reference letter writers
Make sure that the reference knows you well
Ask at least four people to contribute letters!
You will use three of them
Help your references help you

Give them this link:
http://www.nsfgrfp.org/reference_writers/requirements

- 2-page limit
- On letterhead and signed
- Explain nature of the relationship to the applicant
- Address the NSF Merit Review Criteria of Intellectual Merit and Broader Impacts of candidate
- Assess applicant's potential for contributing to a globally-engaged United States STEM workforce
- Evaluate applicant's academic potential and prior research experiences
- Evaluate applicant's proposed research
How to prepare the best application

The **graduate research essay (proposed research)** is the **most important**: focus on intellectual merit

You are trying to prove that you know how to do research!

This statement should be on a research project that you come up with yourself
Suggested sections, graduate research statement

Title

Keywords

Introduction/background information, including a testable hypothesis and/or research objectives or aims

Materials and methods (for testing your hypothesis and/or research objectives)

Expected results and potential pitfalls

Intellectual merit statement

Broader impacts statement
How to prepare the best application

The most common mistakes in the proposed research essay:

Spending too much space on the introduction

Skipping over or glossing over expected results

In research, results are the name of the game, so make sure that you focus on this portion of the essay

Be a reflective practitioner! Can you take your expected results a step further?

How do the expected results tie back to your objectives or hypothesis?
How to prepare the best application

The most common mistakes in the proposed research essay:

Not explicitly mentioning intellectual merit or broader impacts

What are the overall implications of your proposed work?

Before you begin to write: Gather your data
Analyze, interpret your data
Gather your data

Before starting the essay, write out answers to these questions:
   Why are you fascinated by your research area?
   What examples of leadership skills and unique characteristics do you bring to your chosen field?
   What personal and individual strengths make you a qualified applicant?
Gather your data

What are all of your applicable (research) experiences? For each experience, what were the key questions, methodology, findings, and conclusions?
Did you work in a team and/or independently?
How did you assist in the analysis of results?
How did your activities address the Intellectual Merit and Broader Impacts criteria?
Analyze, interpret your data

It’s not enough for a statement to relate personal information about your background or future goals. You need to interpret what the facts says about you.

Consider these traits called “Habits of Mind.”*

How does your narrative reflect one or more of them? Your readers are likely to recognize them as key intellectual and practical characteristics of a successful researcher.

Persistence
Curiosity
Ability to collaborate
Responsible risk taking
Problem-solving abilities
Ability to draw connections

Openness
Responsibility
Flexibility
Engagement
Metacognition
Creativity

* From “Framework for Success in Postsecondary Writing,” a publication of NCTE and WPA.
How to prepare the best application

Personal, Relevant Background and Future Goals Statement

Share your personal character and experiences in the context of your passion to do research.
Don’t just talk about what you have done--be a reflective practitioner.

- Philosophy?
- Impact on science, the public, society, culture?

If you have not completed a formal undergraduate research experience, you must frame your prior work in terms of discovery; prove that you know how to do research through your experiences.
How to prepare the best application

For both essays

Don’t just “mark the dots” with your words, connect them too—in this context, nuance is everything

The intellectual merit of this proposed research is…
The broader impacts of this research are…

Don’t overdo it—but at the same time, you want your reviewers to think that you can change the world
Connecting the dots; example

My career path was inspired through my personal experiences with the Muscular Dystrophy Association (MDA). I became involved with MDA at the age of eight when I was diagnosed with Charcot-Marie-Tooth (CMT) Disease. CMT is a neuromuscular disease that affects the peripheral nerves and causes muscle weakness and atrophy, tightness in muscles and joints, and some loss in sensation of the feet and hands. Through the generosity of others’ time and monetary gifts, I was able to attend summer camp for one week every year. I remember my first year at camp, and realizing how lucky I was as I got to know other campers. I had a lot of pain and wore leg braces, but I was not in a wheelchair. My goal is to design and create assistive medical devices, particularly orthotics and prosthetics, that will allow those with physical limitations to lead a life free of confinement and ultimately result in children being active participants in activities instead of watching from the sidelines.
Connecting the dots; example

• My career path was inspired through my personal experiences with the Muscular Dystrophy Association (MDA). I became involved with MDA at the age of eight when I was diagnosed with Charcot-Marie-Tooth (CMT) Disease. CMT is a neuromuscular disease that affects the peripheral nerves and causes muscle weakness and atrophy, tightness in muscles and joints, and some loss in sensation of the feet and hands. Through the generosity of others’ time and monetary gifts, I was able to attend summer camp for one week every year. I remember my first year at camp, and realizing how lucky I was as I got to know other campers. I had a lot of pain and wore leg braces, but I was not in a wheelchair.

Camp made me more aware of what I could do, but also more aware of what some of my peers could not. This knowledge fired my career goal: to design and create assistive medical devices, particularly orthotics and prosthetics, that will allow those with physical limitations to lead a life free of confinement and ultimately result in children being active participants in activities instead of watching from the sidelines.
How to prepare the best application

Enlist the assistance of a mentor(s) who will critique your essays

Your research mentor and/or one or more of your references

The NSF GRFP co-directors

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Social Science, Emily Elliott, eelliott@lsu.edu

CxC labs, https://www.lsu.edu/academicaffairs/cxc/index.php
How to prepare the best application

Self-critique as if you were a reviewer; also give to a friend to review

Use all the space allotted to you for each essay
  Fitting your essays into two or three pages should be agonizing

Co-authorship on a refereed journal article is a real “feather in your cap”

Multiple drafts are recommended
How to prepare the best application

Get guidance from successful applications: Google “example NSF graduate fellowship” and see what comes up!

University of Cincinnati site
University of Illinois site

Don’t forget that example applications might have 3 essays (old format)—the format you are doing has two essays (personal statement essay and previous experience essay are now combined)

The Fellowship is worth about $28,000 per page of essay that you write! Put in that kind of effort!

If you have already applied, address the comments from NSF proposal reviewers
Resources on writing

• Guide to Proposal Writing from the NSF

• General writing advice, see especially writing for the sciences

• Advice on writing personal statements--Purdue OWL
Next steps

Wednesday, September 18, 5:00-6:30 pm  Student Panel

You will hear from LSU graduate students who received the NSF Graduate Fellowship as they share their experiences from the application process, provide advice, and answer your questions.

You can ask informal questions of the faculty workshop presenters between 4:30 and 5:00!
Next steps

Monday, September 23, 4:30-6:00 pm -- Optional Hands-On Workshop, Room 152 Coates Hall

Focused workshop on developing the broader impacts, intellectual merit, or narrative part of your application

We will send you a link to sign up for this workshop
Next steps

Wednesday, October 9, 5:00-6:30 -- Draft Review Session

Evaluation of your fellowship applications by LSU faculty and your peers
Bring 3 copies of the draft of your application for critique; you will also critique others’ drafts

We will send you a link to sign up for this workshop
GOOD LUCK!!

Get started now!

- Create an account on Research.gov
- Begin working on your essays
- Contact your reference letter writers