2024 Quick Guide

NSF Graduate Research Fellowship Application
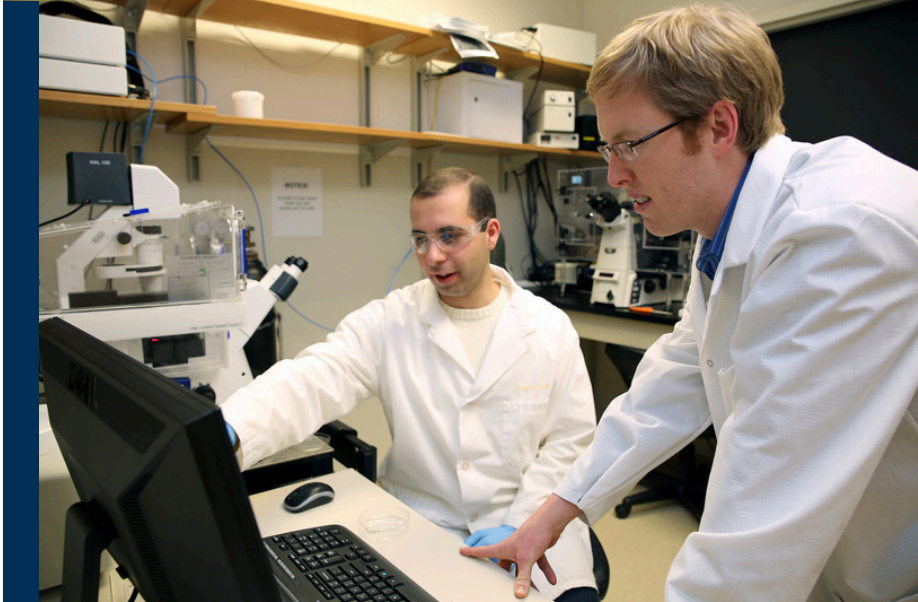
When preparing to apply for National Science Foundation (NSF) Fellowships, your first objective is to review the resources available on the Graduate Research Fellowship Program (GRFP) website. There you can determine your eligibility and level as well as see resources, templates, and frequently asked questions.

Ideally, you will make decisions about your application in consultation with your research advisor. Get clarity on what role they want to play in your planning, writing, and revision process. I recommend writing out your answers to the questions provided on the next two pages to plan out your application during this stage.

The College of Engineering and it's schools host yearly workshops on applying to the NSF GRFP in September. These are useful for gaining institutional knowledge on best practices and developing ideas for updating your documents and framing your personal and research statements.
- The Woodruff School's information session will be Sep. 10th, 11am-12pm in MRDC 4404.

All CoE students are also welcome to attend:
- the ChBE one-day workshop on Sep. 3 at 11 in Klaus 2456 if you register here.
- the two-part MSE workshops, Part I: Crafting a compelling personal statement: Thursday, August 29, 11:00-12:00 noon in Instructional Center, #105, and Part II: Developing a strong research statement (proposal): Tuesday, September 3, 11:00-12:00 noon in Instructional Center, #115 if you register here.

After drafting your statements, consider going to the Georgia Tech Communication Center for a one-on-one consultation about your writing. Help your consultant provide you with actionable feedback by showing them NSF GRFP application guidelines.

If you need additional support planning your communications or revising based on feedback from your consultant please contact the Frank K. Webb Chair in Communication Skills, Dr. Jill Fennell.

Recommended Process

1 Read the Solicitation

2 Determine Eligibility

3 Coordinate with your Advisor

4 Answer Prep Questions on Following Pages

5 Request Letters of Recommendation Due 10/11 by 5pm Eastern

6 Attend the 2024 Overview Workshops

Woodruff School — Sep. 10th, 11am-12pm, MRDC 4404

7 Outline Statements

8 Draft Statements

9 Workshop Statements

10 Revise Statements

11 Submit Application by **Oct. 17, 2024**

Intellectual Merit
Required Focus 1 of 2

The NSF GRFP requires both of your documents to have a focus on your (and your project's) intellectual merit, which should be understood as the **potential to advance knowledge and understanding within one's own field or across different fields.**

Answer the following questions:

Building Ethos:
- Why am I fascinated by my research area, and what issues within the scientific community am I post passionate about?
- What examples of leadership skills and unique characteristics do I bring to the field?
- What personal and individual strengths and experiences make me the right person to succeed in this research?
  - List technical knowledge, skills, teamwork, and relevant training or mentoring.
- How will receiving the fellowship contribute to my career goals?

Advancing Knowledge:
- How does my research contribute to the existing body of knowledge?
  - Identify specific gaps in the literature or areas of uncertainty that your research will address.
- Can my research bridge disciplines or foster interdisciplinary collaboration?
  - Note how your research might impact multiple fields or lead to new interdisciplinary approaches.

Creativity and Originality:
- What makes my research idea innovative?
  - Identify novel methodologies, perspectives, or theories you are employing.
- Does my research have the potential to redefine or challenge existing paradigms?
  - Reflect on how your work might shift current understanding or practices in your field.

Research Design and Rationale:
- Is my hypothesis or research question clearly stated and justified?
  - Ensure that your research question is well-defined and backed by a logical argument.
- Have I chosen the most appropriate methods and tools for my research?
  - Evaluate whether your chosen methods are the best fit for addressing your research questions.
- How is my research feasible for the allotted time and institutional resources?
  - Consider alternative strategies or methodologies if the primary plan encounters challenges.

Assessment of Success:
- What specific outcomes will indicate that my research is successful?
  - Define clear and measurable indicators of success.
- How will I track progress and adapt my research plan if needed?
  - Establish a mechanism for monitoring and adjusting your research as it progresses.

Qualifications of the Researcher(s):
- What past experiences demonstrate my ability to successfully conduct this research?
  - Highlight relevant past projects, publications, or technical skills.
- How do my mentors, advisors, or collaborators strengthen my research proposal?
  - Describe the expertise and roles of any collaborators or mentors involved in the project.

Resources and Support:
- Do I have access to the necessary equipment, software, and facilities?
  - Ensure that you have or can secure all the resources needed to carry out your research.
- Are there any potential collaborations that could enhance my research?
  - Explore opportunities for partnerships with other institutions, labs, or industry.

Broader Impacts
Required Focus 2 of 2

The NSF GRFP requires both of your documents to have a focus on your (and your project's) broader impacts, which should be understood as the ***potential to benefit society and contribute to the achievement of specific, desired societal outcomes***. The reviewers will check for the following:

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
2. To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized and based on sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team or institution to conduct the proposed activities?
5. Are there adequate resources available to the principal investigator (either at the home institution or through collaborations) to carry out the proposed activities?

The following questions are to help you prepare to address the NSF's preferred concerns.

Societal Benefits:
- How will my research positively impact society?
  - Identify specific societal issues your research addresses, such as health, environment, or technology.
- Can my research influence policy, education, or community practices?
  - Consider how your work could inform changes in public policy, educational practices etc.

Advancing Inclusivity in STEM:
- How does my research promote the participation of underrepresented groups in STEM?
  - Identify ways to involve or support women, minorities, or other underrepresented groups in your research activities.
- Are there outreach or mentoring opportunities to engage diverse populations?
  - Identify ways to include outreach or mentorship to encourage diversity in STEM fields.

STEM Education and Literacy:
- Can my research enhance STEM education at any level?
  - Explore how your research can contribute to curriculum development, teaching methods, or student engagement.
- How will I communicate my research to the public or non-expert audiences?
  - Plan strategies for making your research accessible and understandable to broader audiences, including public talks, blogs, or media outreach.

Public Engagement and Awareness:
- What efforts will I make to increase public understanding of science and technology?
  - Think about ways to involve the public in your research through citizen science, workshops, or exhibitions.
- How can my research inspire or motivate others to pursue STEM careers?
  - Note how your work could serve as a model or inspiration for future scientists and engineers.

Economic and National Impact:
- Does my research have the potential to improve national security or economic competitiveness?
  - Identify any potential applications of your research that could enhance national security or contribute to the economy.
- Can my research lead to new technologies, products, or services?
  - Consider the commercial or practical applications of your research findings.

Infrastructure and Partnerships:
- How does my research contribute to the development of research infrastructure?
  - Explore how your work could enhance research facilities, tools, or networks.
- Are there opportunities to build partnerships between academia, industry, and other sectors?
  - Plan for collaborations that might extend the impact of your research beyond academia, such as with industry or government agencies.

Personal Statement
3 Pages, Required

Your CV lists what you've done, but your **personal statement** explains *how* and *why* particular selections from your experiences illustrate that you are the ideal candidate to achieve intellectual goals in the field via your project and contribute to broader impacts.

The NSF funds *you*, not the project. This distinction is key to crafting a compelling personal statement. Your goal is to present yourself as a future leader in your field—someone who can help the NSF fulfill its mission of advancing science and benefiting society. Therefore, it is crucial that you create a vision of yourself as a future peer who can help the NSF achieve their goals.

Curate Your Image

Use this document to curate the image the reviewer has in their head of you to ideally correspond to someone who will achieve the kinds of goals the NSF desires. You want the reviewer to see you as a peer who will not only contribute to the scientific community but also work toward the broader societal goals that the NSF is committed to achieving.
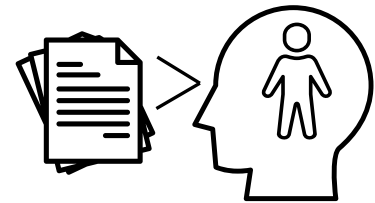
Balance Your Past and Future

Your statement should strike a balance between reflecting on your past accomplishments and outlining your future potential. Highlight your experiences, skills, and achievements that demonstrate your capability to contribute to the NSF's mission. Equally important is articulating your future aspirations and how you plan to make significant contributions to your field and society at large.

Use Anecdotes as Evidence

Your personal statement should be rich with anecdotes that *demonstrate* your abilities. These stories are not just filler; they are your evidence. They provide context and depth to the skills and experiences listed on your CV, illustrating how you've applied your technical knowledge, overcome challenges, and made significant contributions in real-world scenarios.

Don't Merely Repeat Your CV

The NSF will already have access to your CV, so avoid simply repeating what's listed there. Instead, use your personal statement to breathe life into those bullet points. For example, if your CV mentions a project where you led a team, your personal statement might describe how you navigated technical challenges, coordinated with cross-disciplinary teams, and drove the project to a successful outcome. This approach not only highlights your technical and leadership skills but also provides insight into your problem-solving process and resilience.

Craft a Cohesive Trajectory

Think of your personal statement as a narrative that ties together your past experiences, current work, and future aspirations. Each anecdote should build toward a larger story—one that positions you as a future leader in your field, someone who is not only technically proficient but also capable of making broader societal impacts. Create a clear trajectory from what you've do to being the ideal researcher to succeed in your institution at your research project.

Research Plan
2 Pages, TNR 11 single-spaced, Required

What problem does your research address?
- Broader Impacts - Why is it a problem?
- Intellectual Merit - What's your proposed solution?

Introduction: Clarify Your Aim (Don't Assume Readers Care)

Clearly state the research problem your work will address. Convince the reviewers that this is **a problem that needs solving**. Briefly *contextualize* and connect the problem to its broader societal relevance. Why should the NSF and the general public care about this issue? How does addressing this problem align with NSF's goals of benefiting society? Conclude your introduction with a clear statement of your research aim. What do you intend to achieve through your study? This aim should logically follow from the problem you've identified.

Study Overview: Lay Out Your Plans (Demonstrate Your Intellect)

Show that you know the necessary science to succeed at this project by describing why the core idea behind your research has merit. Contextualize: briefly place your proposed solution within the context of existing research. How does your work build on or differ from what's already been done? Clearly state the specific objectives of your study and any hypotheses you plan to test. Make sure these align with your overall aim.

Sub-Section the Research Phases (Demonstrate Feasibility)

Break down your research into distinct phases (including work you've already done). For each phase describe:
- **What you will do:** Outline the key activities, methods, or experiments you will undertake.
- **Why are you doing it this way:** Clarify the intellectual merit of your approach.
- **How you will do it:** Explain the techniques, tools, resources, labs, partnerships, professors, or methodologies you will use to carry out each phase.
- **What are expected challenges:** Identify any potential conclusions, challenges, or limitations you foresee and how you plan to address them. What's your contingency plan?
- **What are internal phase deliverables:** Show how you will be producing deliverables along the way such as conference presentations, publications, or tangibles like data sets, algorithms, new methods, or prototypes.

Clarify Impact (Results Use Value)

Outline the results you expect to obtain from your research. What new knowledge or understanding do you anticipate your work will produce? Reiterate how your research outcomes will contribute to societal goals. Will your findings help solve a pressing problem, inform policy, advance technology, or increase public engagement with science? Highlight how your research will advance knowledge in your field. How will your work push the boundaries of what is currently known (close a gap in knowledge) or lead to further scientific inquiry?

Final Tips (Make it Easy for Readers)

Be Specific, but Avoid Jargon: Avoid vague statements (and undefined acronyms) and write for engineers, but non-specialists. Provide concrete details about your research process, expected outcomes, and the broader significance of your work.
Stay Focused: Make your plan easy to follow. Ensure that every section of your research plan ties back to your research aim and the NSF's criteria of Intellectual Merit and Broader Impacts.
Demonstrate Feasibility: Make it clear that your research plan is not only innovative but also feasible within the timeline and resources available to you.

Key Words (+ because)
Recommendations

Each word does a unique job of transferring meaning and feeling; therefore, you always want to make sure your use of words is accurate to want you want to convey.

In applications, it is important to be clear how you are meeting the criteria the solicitation asks for; **using the same words the solicitation uses can help create that clarity. *But, using them alone will result in writing that is vague and may come across as pandering. You must explain why your work features these things, generally through a because clause.***

Intellectual Merit & Innovation

- Intellectual Merit
- Advancing Knowledge
- Innovation
- Creative
- Original
- Transformative
- Knowledge Expert
- Significant Contribution
- Experience
- Unique Resources
- Feasibility
- Strategic Impact

Personal Qualities & Potential

- Potential
- Prepared
- Qualified
- Passion
- Fascination
- Leadership
- Personal Strength
- Experience
- Globally Engaged

Collaboration & Teamwork

- Collaboration
- Teamwork
- Interdisciplinary
- Collaboration Across Sectors
- Unique Resources

Broader Impacts & Societal Outcomes

- Broader Impacts
- Societal Outcomes
- Public Good
- Public Engagement
- Scientific Literacy
- STEM Education
- Diversity and Inclusion
- Equity
- Community Involvement
- Mentorship
- Capacity Building
- National Security
- Economic Competitiveness
- Collaboration Across Sectors
- Sustainability

Assessment & Feasibility

- Feasibility
- Assessment Mechanism
- Rationale
- Holistic Review
- Strategic Impact

Motivation & Engagement

- Motivate
- Passion
- Fascination
- Public Engagement
- Globally Engaged