

NSF Graduate Research Fellowship Program

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Overview

INTRODUCTION TO THE NSF GRFP

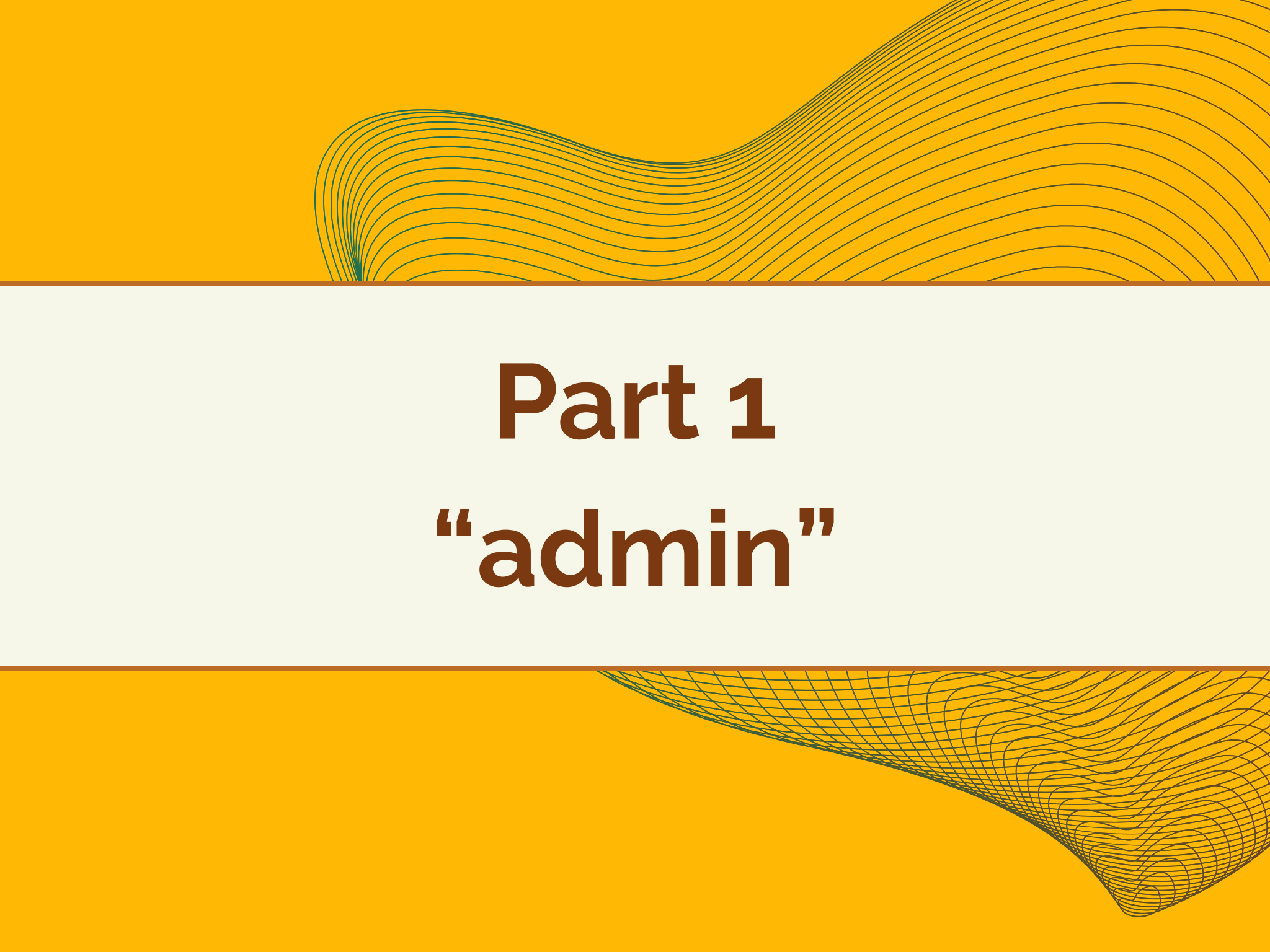
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Introduction - NSF GRFP

Sponsored by the U.S. National Science Foundation, focuses on developing future leaders in science, technology, engineering, and mathematics.

“The purpose of the NSF Graduate Research Fellowship Program (GRFP) is to help ensure the quality, vitality, and strength of the scientific and engineering workforce of the United States. Since 1952, the program recognizes and supports outstanding graduate students who are pursuing full-time research-based master's and doctoral degrees in science, technology, engineering, and mathematics (STEM) fields, including STEM education. NSF GRFP was established to recruit and support individuals who demonstrate the potential to make significant contributions in STEM, including STEM education. NSF encourages applications from the full spectrum of talent that the U.S. has to offer.”



Part 1

“admin”

2026 Deadlines

Application Deadline(s) (received by 8 p.m. Eastern Time).

October 19, 2026

- Life Sciences

October 20, 2026

- Computer and Information Science and Engineering; Materials Research; Psychology; Social Sciences

October 22, 2026

- Engineering

October 23, 2026

- Chemistry; Geosciences; Mathematical Sciences; Physics and Astronomy

Eligibility - NSF GRFP

Applicants must:

- Be a U.S. citizen, national, or permanent resident
- Pursue an eligible research-based STEM master's or doctoral degree
- Be a **senior undergraduate, bachelor's degree holder** not yet enrolled in graduate school, or a **first-year graduate student** in their first graduate program
- Not have previously accepted a GRFP award.

Eligibility -

Applying as a senior vs G1

Applicants may apply senior year and prior to enrolling in graduate school (e.g., gap year or job prior to grad school).

Once enrolled in graduate school, students may **only** apply in the fall of the first year of a graduate school.

If you applied as a senior and were not awarded, applying during your first of graduate school is recommended if you have stronger references, more research experience/publications, or more Broader Impacts, etc.

Those who completed a combined bachelor's & master's or a master's in a field supported by the NSF should carefully check the solicitation to determine their eligibility to apply as a graduate student.

Current year solicitation

<https://www.nsfgrfp.org>

Solicitation linked [here](#).

Read this carefully; applications not conforming to the eligibility, formatting, and reference requirements will not be considered by the NSF.

Application module to submit your applications:

<https://www.research.gov/grfp/Login.do>

Thoroughly understand the application process elements & the deadline dates. Read through the solicitation.

- Applications due by **8pm Eastern** by Field of Study deadline date.
- Reference letters due by **8pm Eastern, October 16**

Current year solicitation (cont'd)

NSF will continue to emphasize high priority research in alignment with the priorities laid out in **pages 129-130** of the FY 26 Budget of the U.S. Government, linked [here](#).

Applicants and reference letter writers requiring accessibility accommodation are asked to notify the GRF Operations Center at least four weeks before the deadline to coordinate assistance with NSF in submitting the application or reference letter

Preparation - solicitation

<https://www.nsfgrfp.org>

Thoroughly understand the application process elements & the deadline dates. **Read through the solicitation.**

Line up your reference writers now – those who have taught you or supervised your research are best (min 3, max 5).

Note that the top three letters of the applicant's preference will be included in the application. Reference writers will receive an email request to submit a letter of reference on behalf of an applicant; they will not be informed of the preferred order.

Know the goals of the NSF in relation to the GRFP – **read the solicitation.**

Applicants are advised to consult a faculty member, academic advisor, mentor, or other advisor for guidance on preparation of their research plans, and selection of Major Fields of Study and Subfields.

Research Eligibility

Ineligible degree programs

Individuals are not eligible to apply if they will be enrolled in a practice-oriented professional degree program such as medical, dental, law, and public health degrees at any time during the fellowship.

- Ineligible degree programs include, but are not limited to: MBA, MPH, MSW, JD, MD, DVM and DDS.
- Joint or combined professional degree-science programs (e.g., MD/PhD or JD/PhD) and dual professional degree-science programs are not eligible.
- Individuals enrolled in a graduate degree program while on a leave of absence from a professional degree program or professional degree-graduate degree joint program are not eligible.

Research Eligibility cont'd

Ineligible areas of study

Individuals are not eligible to apply if they will be enrolled in graduate study focused on clinical practice, counseling, social work, patient-oriented research, epidemiological and medical behavioral studies, outcomes research, and health services research.

Ineligible study includes: pharmacologic, non-pharmacologic, and behavioral interventions for disease or disorder prevention, prophylaxis, diagnosis, therapy, or treatment.

Research to provide evidence leading to a scientific basis for consideration of a **change in health policy or standard of care** is not eligible.

Graduate study focused on **community, public, or global health, or other population-based research including medical intervention trials** is also not eligible.

Research Eligibility cont'd

Ineligible proposed research

Biological or psychological research for which the goals are directly human disease- or health- related, including the etiology, diagnosis of, and treatment and/or interventions for, physical or mental disease or disorder is not eligible for support.

Research activities using **animal models of disease for developing or testing of drugs, procedures, or interventions for treatment of physical or mental disease or disorder** are also not eligible.

Research focused on basic questions in plant pathology **are eligible, however**, applied studies focused on maximizing production in agricultural plants or impacts on food safety, are not eligible.

Research with implications that **inform policy is eligible**. Research with the expressed intent to **influence, advocate for, or effect specific policy outcomes is not eligible**.

Research Eligibility cont'd

Limited exceptions to ineligible proposed research

See **pg. 9** of the solicitation

Certain areas of bioengineering research directed at medical use are eligible.

Applicants planning to study and conduct research in these areas of bioengineering should **select biomedical engineering** as the field of study.

Certain areas of materials research directed at development of materials for use in biological or biomedical systems are eligible, provided they are **focused on furthering fundamental materials research**.

Certain areas of research with etiology-, diagnosis-, or treatment-related goals that **advance fundamental knowledge** in engineering, mathematical, physical, computer or information sciences, are eligible for support.

The background features a solid yellow color with abstract, wavy green lines that create a sense of movement and depth, particularly in the upper and lower portions of the frame.

Part 2

the Application

Developing your Essay

Read solicitation & understand it

Begin drafts ASAP

There is no word count – these essays use a page limit

- 3 page personal statement
- 2 page graduate research statement

Broader Impacts & Intellectual Merit, you need to address them with separate headings in each essay.

From the Solicitation:

"Intellectual Merit" and "Broader Impacts" sections must be present under **separate headings in both** Personal and Research Plan statements. Applications that **do not have** separate headings for Intellectual Merit and Broader Impacts will **not** be reviewed."

Application evaluation

Broader Impacts

The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

Review **Chapter III** of the NSF Proposal and Award Policies and Procedures Guide for additional information

Intellectual Merit

The Intellectual Merit criterion encompasses the potential to advance knowledge.

A detailed description of the Merit Review Criteria is provided in **Chapter III** of the NSF Proposal and Award Policies and Procedures Guide.

Broader Impacts

- international experience
- publications and presentations
- mentor, TA, volunteer tutor, etc.
- science outreach
- ANY volunteer work regardless of field
- leadership activities
- interdisciplinary collaboration
- broad dissemination of scientific understanding

You should be able to articulate how to apply your knowledge and skills to “the bigger picture”.

Broader Impacts - essay assessment

How your application demonstrates that you:

1. advance scientific discovery and understanding, while promoting teaching, training, and learning,
2. broaden the participation of underrepresented groups, e.g., gender, ethnicity, disability, geographic,
3. enhance the infrastructure for research and education, such as instrumentation, research networks, and collaborations,
4. broadly disseminate results to enhance scientific and technological understanding, and
5. benefit society.

Intellectual Merit

- evidence of intellectual ability and potential to advance knowledge
- GPA
- rigor of research plan, and potential for scientific leadership in field
- technical knowledge and skills
- ability to work collaboratively and independently
- references

Thinking about application writing

PLAN your writing before you start to ensure a cohesive structure with strong evidence to support claims

REVISE your writing systematically to improve flow, organization, paragraph structure, and syntax

These stages usually take more time than the writing itself!

Getting stuck? The writing center has resources for many writing challenges on our website:

<https://writing.caltech.edu/resources-for-writers/hwc-resources-for-caltech-writers>

Thinking about application writing

Fellowship writing is persuasive writing

Build ARGUMENTS backed by evidence for why you are the best candidate for the limited funds available

1. I have the right plan to answer an important question
(research statement)
2. I have the potential to enhance our research community
(personal statement)

Personal Statement

- keep review criteria in mind – Intellectual Merit and Broader Impacts
- this is your chance to show your drive, curiosity, skills, and ability to communicate
- show evidence of potential
- seniors can mention top choice(s) of grad school; if grad student, can mention why you selected Caltech.

Personal Statement (cont'd)

Relevant Background

- experience can be chronological or in order of importance
- include any personal, professional, or educational experiences relevant to GRFP goals
- what skills you have developed
- examples of creative problem solving
- mention failures if you can use these to illustrate growth
- examples of independent and teamwork
- How your research or work has been shared
- do not include high school information, **unless** it is the beginning of a continual effort that extended beyond high school

Personal statement: build a compelling narrative



Who are you, how did you get here, and where are you going?

What experiences have made you the scientist you are today?

How will you build on these experiences to expand your impact and become a leader in your field?

Aim for cohesive and concrete

Build a cohesive story: think about how your experiences and accomplishments tie into your future goals



Champion underwater basket weaver?

Maybe this accomplishment shows interest and preparation for engineering novel structures for underwater environments?

Think about concrete, actionable plans: what specific things can you do to enhance your academic and broader community?

Experience in a club helping other students find research opportunities?

Maybe in grad school you will start a peer mentoring program, or commit to bringing undergrads into your research

...which will prepare you for your dream career as a professor running your own research group

Stuck? Start with a theme or thesis

Develop a tagline or “thesis statement” for yourself

Capture your interests, values, and skills in one sentence

Example:

I’m interested in how microbes navigate dynamic environments and care about helping new researchers learn to navigate their environments too.

**Research
history**

**Mentorship
experience**

**Personal
insights**

-----Supporting evidence -----

Research Statement

You are ultimately not required to stick to the proposed research plan, but must project must stay within the "field of study" used in application.

- **work with your advisor & research group to review feasibility**
- **okay to use graphics or formulae to articulate something if those are more succinct and/or effective than text**
- **put ideas/facts in perspective for those not in your exact field, your reviewers may be field-adjacent**
- **okay to name professors, university, etc. But you can appropriately abbreviate some words after using them to save space (e.g. "Prof.")**
- **stick to format requirements (especially the citations)**

Research Statement - Broader Impacts

- How will this research effect the world?
- How will you present it to a wider audience?
- Is there interdisciplinary collaboration?
- Is there international/external collaboration?
- How will you continue to reach out to non-scientists through your research?

Showcase scientific thinking through project design

A well-constructed project plan is more important than having the biggest, most ambitious project scope



Think of your proposal as a puzzle where every piece must fit together exactly:

Motivation → research question

research question → approach

approach → specific outcomes

Outline your proposal before you write

Here's something that's really important...

Here's something we don't know about it/can't do...

Evidence suggests we should consider/do X...

...which leads to my plan to do...

Objective 1

Objective 2

Objective 3

From this work we will learn...

Which will affect future research in the field or society by...

Hint: develop a scaffold by reading winning proposals

This is the topic and why it matters to society	Cystic fibrosis (CF) is a genetic disease that affects close to 40,000 individuals in the United States, and more than 105,000 people worldwide [1]. The current life expectancy of individuals with CF in the United States has improved over the past 30 years but averages to only 48.4 years, nearly 30 years less than the median life expectancy of the average U.S. citizen [2].
Current state of the field	CF results from a mutation of the CF transmembrane conductance regulator (CFTR) gene, which encodes proteins that function as chloride channels within cell membranes. Current research aims to slow the progression of CF using gene modulators, which target the defective proteins produced by mutated CFTR genes.
Problems that remain	However, these treatments lack long-term effectiveness and can show adverse effects including worsening of pulmonary symptoms and other clinical presentations [3][4]. Additionally, CFTR modulators can only correct one genetic mutation, but there are many possible mutations that can cause CF.
What I'm doing about them	Therefore, my objective is to develop a hydrogel nanoparticle (nanogel) treatment for correcting CFTR genetic anomalies that is effective long-term, can be applied to a broader range of mutations, and has fewer side effects.
Evidence to support my plan	Previous studies have shown that nanogels have high potential as nucleic acid delivery systems, due to their size and drug delivery advantages. Nanogels are easily producible, tunable for specific applications, and show increased effectiveness over time compared to lipid nanoparticles (LNP's) and gene modulators [5]. Similarly, mRNA therapies are well-suited to treating a broad range of CFTR mutations, since mRNA targets the protein encoding process rather than the defective protein itself [6].
Specific hypothesis	I hypothesize that PEGylated nanogels will successfully deliver mRNA for mutated CFTR genes in CF, exhibiting greater efficacy than other nanomaterials through targeting and mucoadhesion mechanisms.

Annotate while you read: what is the role of each sentence or section?

Persuasive strategies in the research statement

Be a “we” not a “me” writer

Be clear about why your research matters to the field, to society, to NSF’s research priorities. Motivate your project with a compelling, relevant question and think creatively about impacts and extensions of the work in the short and long-term.

Aim for specific, concrete writing

Readers should be able to picture exactly what you are going to do and what you will learn.

“I propose to explore” → not specific!

WHAT are you looking for? HOW will you explore it? Do you have a HYPOTHESIS about what to expect?

Reference Letters, pg13

Requirements include:

- Institutional or professional letterhead, if available;
- SIGNED by the reference writer, including the name, professional title, department, and institution;
- Two (2) page limit in PDF format;
- Standard 8.5" x 11" page size;
- 11-point or higher Times New Roman font, and;
- Single-spaced using normal (100%) single-line spacing.

Reference letters should

- address the NSF Merit Review Criteria of Intellectual Merit and Broader Impacts,
- provide details explaining the nature of the letter-writer's relationship to the applicant (including research advisor role),
- comment on the applicant's potential for contributing to a globally-engaged United States science and engineering workforce,
- include statements about the applicant's
- academic potential,
- prior research experiences,
- proposed research, and
- provide any other information that will aid review panels in evaluating the application according to the NSF Merit Review Criteria.

Formatting - Proposal Essays

Essays, pg11

All sections of the proposal must follow these formatting guidelines:

- Standard 8.5" x 11" page size;
- Arial (not Arial Narrow), Courier New or Palatino Linotype, 10-point or larger font; Times New Roman or Computer Modern family, 11-point or larger font
- Smaller than 10-point fonts are accepted for mathematical formulas, equations, figures, tables, or diagram captions; Symbol or Cambria Math fonts are accepted for Greek letters or special characters.
Descriptive alternative text should be provided for all images, graphs, and charts, including sufficient color contrast for text and graphics, in machine readable/accessible electronic format (e.g., HTML) to ensure legibility and readability for individuals with visual impairments;
- Maximum six lines of text per vertical inch, using 12-point line spacing for 10- or 11-point fonts
- 1" blank margins on all sides;
- PDF;
- References: abbreviated journal or publication titles ONLY, no URLs or DOIs;

Formatting - Proposal Essays

Address NSF's Merit Review Criteria (Section VI) of "Intellectual Merit" and "Broader Impacts" under separate individual headings in both Personal and Research Plan statements.

Do not include other terms. Do not combine the headings or the sections.

Insert line breaks between the "Intellectual Merit" and the "Broader Impacts" sections of each Statement.

The Personal, Relevant Background, and Future Goals Statement **maximum is three (3) pages** (PDF).

The Graduate Research Plan Statement **maximum is two (2) pages** (PDF).

Include **all** references, citations, charts, figures, images, and lists of publications and presentations in the page limits.

Next Steps - NSF GRFP

- **Begin drafting essays now**
 - Develop a compelling research vision
 - Learn the Intellectual Merit and Broader Impacts criteria
 - Connect past experiences to future research goals
- **Seek feedback from faculty and previous recipients**
- **Request recommendation letters early**
 - provide relevant information about the fellowship

Review the FAQ page:

<https://www.nsfgrfp.org/reviewers/faqs-2-org.html>

Support while writing

NSF GRFP @ HWC

SEPT 15 – OCT 20

EVERY TUESDAY 12:00–1:30 PM, CSS 360

Drop-in writing hours

- Communal writing workspace
- Worksheets, writing guides and annotated models for every stage in the process
- STEM writing specialist availability for short consultations and questions

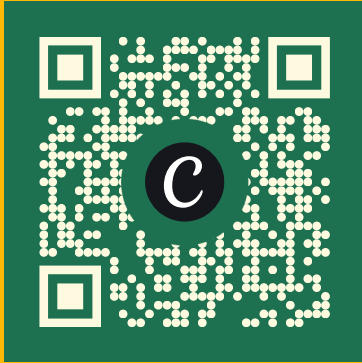
NSF GRFP walk-in advising @ FASA

SEPT 21 – OCT 19

**MONDAYS 12:00–1:30 PM,
CSS 319**

Walk-in GRFP application advising:

- essay feedback triage (limited to 10 min at one time when students are waiting)
- writing workspace w/past awardee samples
- application content resources



**Take this
survey to
give
feedback!**

Questions?

We're here to help you navigate the process.

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Rm 319, CSS Building

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