

# National Science Foundation Graduate Research Fellowship Program (GRFP)



Presented by Caltech Fellowship Advising and Study Abroad Office

Caltech

# Key Elements & Eligibility

- **Citizenship:** U.S. citizens or permanent residents
- **Early-career:** undergraduate seniors & 1<sup>st</sup> and 2<sup>nd</sup> year graduate students — **one** application as a **graduate student**
- **Portable:** Any accredited U.S. institution MS or PhD program.
  - Pursuing research-based MS or PhD. No taught programs.
  - Science and Engineering Approved Fields.
  - Can put on reserve only for a special educational opportunity
- **Prestigious** – indicates recipients have great potential.

The NSF estimates 2500 awards for the (FY) 2024 competition; last year there were over 12,000 applicants.

3 years of support during a 5-year fellowship period. For each of the 3 years, a \$37,000 stipend and \$16,000 cost of education allowance are provided.

# Applying Senior Year or 1<sup>st</sup> Year vs. 2<sup>nd</sup> Year

Applicants can apply senior year and **prior to enrolling** in graduate school (e.g., a gap year or job prior to graduate school). **Those who did a combined bachelor's & master's or did 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.**

Once **enrolled** in graduate school, students can only apply once either in the fall of the first year of a graduate school **OR** in the fall of the second year of graduate school. Students are evaluated with the understanding of the additional experience that a 2nd year has versus a 1st year.

If you applied as a senior and did not win, applying during your first year of graduate school is attractive if you have stronger references, more research experience/publications, or more broader impacts, etc. Or you could consider applying second year.

*(FAQ: If the applicant started at the current institution in the fall of the application year and the institution does not provide unofficial or official transcripts prior to completion of the first term, the applicant may submit a class schedule/enrollment verification form in place of a transcript.)*

# Make Sure You & Your Research Are Eligible

## 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 also 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.

## 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.

# Make Sure You & Your Research Are Eligible (cont'd)

## Ineligible proposed research

Research for which the goals are directly human disease- or health-related, including the etiology, diagnosis, and/or treatment of disease or disorder is not eligible for support.

- Research activities using animal models of disease, for developing or testing of drugs or other procedures for treatment of disease or disorder are 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.

# Make Sure You & Your Research Are Eligible (cont'd)

## Limited exceptions to ineligible proposed research

- Certain areas of bioengineering research directed at medical use are eligible. These include research projects in bioengineering to aid persons with disabilities, or to diagnose or treat human disease or disorder, provided they apply engineering principles to problems in medicine while primarily advancing engineering knowledge. 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.

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.

# Preparation

- Thoroughly understand the application process elements & the deadline dates.
- Line up your reference writers now – those who have taught you or supervised your research are best (min 3, max 5). **Note well that the GRFP considers only the first 3 references submitted.**
- Know the goals of the NSF in relation to the GRFP – read the program solicitation

# Solicitation Current Year

Solicitation found at:

<https://www.nsf.gov/pubs/2023/nsf23605/nsf23605.pdf>. *Read this carefully as you must abide by the directions exactly!*

Application module to submit your applications, research.gov :

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

- Applications due by **5 pm local time of applicant's mailing address** by subject deadline date.
- Reference letters due by **5 pm (EDT), October 27<sup>th</sup>**

NSF will continue to emphasize high priority research in alignment with the priorities laid out in pages 127-128 of the FY2024 budget [https://www.whitehouse.gov/wp-content/uploads/2023/03/budget\\_fy2024.pdf](https://www.whitehouse.gov/wp-content/uploads/2023/03/budget_fy2024.pdf).

- 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

# GRFP Program Goals

- To select, recognize, and financially support individuals early in their careers with the *demonstrated potential to be high achieving scientists and engineers*
- To *broaden participation in science and engineering* of underrepresented groups, including women, minorities, person with disabilities, and veterans.
- GRFP is a critical program in NSF's overall strategy to *develop the globally-engaged workforce* necessary to ensure the Nation's leadership in advancing science and engineering research and innovation.

# Resources

- Essays from prior GRFP winners are available for review in the FASA Office, Room 319 in the Center for Student Services on Holliston Ave.
- FASA advising & essay review by appointment—an appointment sign-up link will be available on the FASA site in September
  - Send essay draft at least **5 working days before** your appointment & please note we do not proofread
- Your research advisor & group
  - especially if you are uncertain of which field you should apply under/what major area your research best fits
- Review & refer to the GRFP website, FAQs, & Solicitation

# The Bedrock of the 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 II 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](#).

# GRFP Scoring

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. Visit here for more information: [NSF Proposal and Award Policies and Procedures Guide](#).

All areas need both Intellectual Merit & Broader Impacts.

## Holistic GRFP Review

<b>Application Component</b>	<b>Intellectual Merit</b>	<b>Broader Impacts</b>
Personal Statement	Yes	Yes
Research Statement	Yes	Yes
Transcripts	Yes	Yes
Reference Letters	Yes	Yes
<b>Overall Rating</b>	<b>E/V/G/F/P</b>	<b>E/V/G/F/P</b>

# Broader Impacts- 50% of Score

- 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
- Showing that you know how to apply your knowledge and skills to the bigger picture.

# Intellectual Merit- 50% of score

- 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

# Developing Your Essays

- Read GRFP solicitation & understand it
- Begin drafts ASAP
- Create a list of how your proposal would meet the Broader Impacts and Intellectual Merit requirements
- Start with content:
  - research experience, outreach experience, etc.
  - then write intro & conclusion

# Developing Your Essays (cont'd)

- Not a word count – page count
- 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."

# Broader Impacts Used to Assess Essays

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.
5. benefit society.

# Essay #1:

## 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, why you selected Caltech.

# Relevant Background

- Experience can be chronological or in order of importance.
- Include any personal, professional, or educational experiences relevant to GRFP goals.
- What skills have you developed?
- Examples of creative problem solving.
- It is okay to mention failures if you use these to illustrate growth.
- Examples of independent work, as well as a good team player.
- How did you share your research?
- No high school information, unless it is the beginning of a continual effort that extended past high school

# Personal Statement Sample

## **Intellectual Merit**

"The opportunity in the [REDACTED] lab to mentor another undergraduate student was extremely valuable: it helped me realize my love for teaching and mentorship, which I now hope to pursue in my career – I would like to become a professor and run a research group. Additionally, my work in the [REDACTED] lab gave me practical experience in both inorganic synthesis and physical chemistry, particularly kinetics. However, during the course of my work there, I realized that I most enjoyed the synthetic aspects of the research, and decided to seek out research experience in pure synthetic chemistry."

## **Broader Impacts**

"Pursuing a Ph.D. will enable me to gain invaluable experience in organic chemistry in a laboratory that performs cutting-edge work. I will grow as an independent researcher and gain skills that I will be able to apply throughout my career. Receiving an NSF Graduate Research Fellowship will allow me the time to focus on achieving my educational outreach goals and to produce research results. During my graduate studies, I will continue to serve as a mentor for high school and undergraduate students, with the hope that I can help ignite the same passion for chemistry that has served me throughout my education."

# Essay #2:

## Research Statement

- Not required to stick to the proposed research plan
- Propose research that shows you have *potential for significant achievement and vision*
- Work with your advisor & research group
- 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
- 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

# Broader Impacts in Research Statement

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

# Research Statement Sample

## Intellectual Merit

"This work will be done with [REDACTED], Professor of [REDACTED] at Caltech. [REDACTED] has almost [REDACTED] years of experience in this area and a fully equipped laboratory. The apparatus consists of a U-tube shaped device which enables the application of subtle chemical potential. One side of the U-tube contains a concentric capacitor, which creates a chemical potential (hence driving flow) when a voltage is applied. The other side of the U-tube contains a microwave resonator whose resonant frequency changes as a result of helium's dielectric properties. The weak link is placed in between these two components..."

## Broader Impacts

"As an underrepresented voice in science, I understand that my journey may encourage others to consider science. Therefore I will continue to tutor and encourage minority students to pursue and engage in STEM. I will participate in outreach initiatives geared to increase the involvement of underrepresented groups in science and engineering. I will also work to communicate my research to the general public through the [REDACTED] organization on campus – an online student-run publication that is committed to raising the voices of traditionally underrepresented scientists and aims to convey to the general public the importance of scientific research."

# Formatting

## FOR APPLICANTS

- standard 8.5" x 11" page size
- 11 point or higher font
- Times New Roman font for all text, Cambria Math font for equations, Symbol font for non-alphabetic characters
- 1" margins on all sides, no text inside 1" margins (no header, footer, name, or page number)
- No less than single-spacing (approximately 6 lines per inch)
- Do not use line spacing options such as "exactly 11 point," that are less than single spaced
- PDF file format only
- OK to use headings, bold, italics, columns, etc. Must have IM & BI sections w/ headings.

## FOR REFERENCE WRITERS

*(3, max 5)*

- Institutional (or professional) letterhead, if available
- **Signed** by the reference writer; including the name, professional title, department, and institution
- Two (2) page limit
- 11-point or higher Times New Roman font and 1" margins on all sides
- Single spaced using normal (100%) single-line spacing
- They are provided a new login to submit a reference letter

# General Advice

- Avoid grand statements – give specifics instead
- Do not use contractions
- Essays are read by 3 academics in your major field, not subfield – they are your evaluators
- Avoid repetition in your essays
- Good essays take many drafts
- Do not wait until the last minute to start essays
- Line up reference writers now & communicate with them about your Broader Impacts & Intellectual Merit background

# References

- Required to have **3 references, with a maximum 5**
  - Note that the reviewers read 3 references, so if you provide 5, they will likely only read the first 3 uploaded
- Contact references ASAP
  - It is okay to coach them and provide information about how you meet Broader Impacts and Intellectual Merit in your research plan and personal statement
- Make sure NSF references are aware of deadline – **5pm EDT, October 27th.**
  - You can set an earlier suspense date for the letters, let the writers know
- **Faculty in your field are preferred** – don't ask coaches, grad students, humanities professors, or deans
  - Employers or postdocs are acceptable if they supervised your research; social science professionals only if the subject matter is within your graduate field (e.g., Economics)
- Letters are instrumental to scoring in the review
  - **Emphasize the importance of both Intellectual Merit and Broader Impacts as part of your reference letters**

# Deadlines

There is only one deadline for you, based on your field of study

- **October 16, 2023** Life Sciences
- **October 17, 2023** Computer and information Science and Engineering, Materials Research, Psychology, Social Sciences, STEM Education and Learning
- **October 19, 2023** Engineering
- **October 20, 2023** Chemistry, Geosciences, Mathematical Sciences, Physics and Astronomy

Applications must be received by **5:00 p.m. local time**, as determined by the applicant's mailing address provided in the application. **Applications received after the field of study deadline will be returned without review.**

(References due by **Oct. 27, 5 pm EDT**, can submitted earlier)

**Withdrawal Deadline:** Applications withdrawn by November 15 of the application year do not count toward the one-time graduate application limit. Applications withdrawn after November 15 count toward this limit.

# Questions?

[caltech.edu](https://caltech.edu)