Graduate Research Fellowship Program

Presented by Caltech Fellowship Advising and Study Abroad Office
Current a/o Aug 2024

Caltech

The National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) is the country's **oldest** fellowship program that directly supports graduate students who show potential to contribute to scientific accomplishments and innovation in the U.S.

GRFP was established as the **first** program in the foundation's history, to encourage individuals to pursue graduate education in science.

Since 1952, NSF has funded over 70,000 Graduate Research Fellowships out of more than 500,000 applicants.

Caltech

"Admin"

Pt. 1,
Elements & Eligibility

Caltech

GRFP Program Goals

The purpose of the NSF Graduate Research Fellowship Program (GRFP) is to help ensure the **quality, vitality, and diversity** of the scientific and engineering workforce of the United States.

The program recognizes and supports outstanding graduate students who are pursuing full-time research-based master's and doctoral degrees in STEM or in STEM education.

NSF actively encourages submission of applications from the **full spectrum of diverse** talent that society has to offer which includes underrepresented and under-served communities.

The 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, engineering research, and innovation.

Caltech

Key Elements

Portable: Any accredited U.S. institution MS or PhD program

- pursuing research-based MS or PhD

- science and engineering approved fields

- can put on reserve only for a special educational opportunity

The NSF estimates **2300** awards in spring 2025; last year there were over 12,000 applicants competing for 2500 awards.

This GRFP award provides 3 years of support during a 5-year fellowship period.

A $37,000 stipend and $16,000 cost of education allowance are provided for each year.

Caltech

Eligibility

- U.S. citizens <u>or</u> permanent residents
- undergraduate seniors & 1st and 2nd year graduate students — **one** application as a graduate student
- never previously accepted a GRFP
- declined any previously offered GRFP by the acceptance deadline
- never previously applied to GRFP while enrolled in a graduate degree program
- never earned a doctoral or terminal degree in any field
- intend to enroll or be enrolled full-time in a research-based Master's or doctoral degree program in an eligible Field of Study in STEM or STEM education *(See solicitation Appendix and Section IV.3 for eligible "Fields of Study")*

Caltech

Applying Senior Year or 1st Year vs. 2nd 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.

Caltech

Applying Senior Year or 1st Year vs. 2nd Year (cont'd)

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

NOTE: 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.

Caltech

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**.

Caltech

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**.

Caltech

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. 13 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.

Caltech

Preparation

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 GRFP considers only the first 3 references submitted and applications with less than 3 reference letters will not be reviewed.

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.

Caltech

Current Year Solicitation

Solicitation found 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, research.gov :
https://www.research.gov/grfp/Login.do

- **Applications due** by **5 pm** local time of applicant's *mailing address* by Field of Study deadline date.

- **Reference letters** due by **5 pm** (EDT)**, October 11**

Caltech

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 2025 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

Caltech

"The Main Event"

Pt. 2,
The Application

Caltech

The Application Evaluation

<u>Broader Impacts</u>

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

- Review **<u>Chapter III</u>** of the [NSF Proposal and Award Policies and Procedures Guide](#) for additional information

<u>Intellectual Merit</u>

The Intellectual Merit criterion encompasses the potential to advance knowledge.

- A detailed description of the Merit Review Criteria is provided in **<u>Chapter III</u>** of the [NSF Proposal and Award Policies and Procedures Guide](#).

Caltech

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.

GRFP Review

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

Caltech

Developing Your Essays

Read 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

Caltech

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 <u>must</u> 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."

Caltech

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

- articulate how to apply your knowledge and skills to the bigger picture.

Caltech

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, and

5. benefit society.

Caltech

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

Caltech

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, can mention why you selected Caltech.

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

Caltech

Personal Statement Sample

Intellectual Merit

"The opportunity in the ███ 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 ███ 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."

Caltech

Essay #2:
Research Statement

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

Caltech

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?

Caltech

Research Statement Sample

Intellectual Merit

"This work will be done with ████████████, Professor of ██████████ at Caltech. ████████ has almost █ 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 ████████████ 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."

Caltech

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
- cited references should include name of the journal (abbreviations accepted)
- 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
- 2 page limit
- standard 8.5" x 11" page size
- 11-point or higher Times New Roman **font** and 1" **margins** on all sides
- single **spaced** using normal (100%) single-line **spacing**

Note: Reference writers are provided a new login to submit a reference letter

Caltech

"In Conclusion..."

Pt. 3,
Resources, Notes & Summary

Caltech

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

Caltech

References

You are required to have **3 references, with a maximum 5 reference letters.**

- 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 reference writers are aware of deadline – **5pm EDT, October 11th.**

- you can set an earlier suspense date for the letters, let the writers know

Caltech

References, cont'd

Faculty in your field are preferred – do not use coaches, grad students, humanities faculty, or deans

- Employers or postdocs are acceptable <u>if</u> they supervised your research; social science professionals <u>only</u> 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

Resources

Essays from prior GRFP winners are available for review in the FASA Library, Room 319 in the Center for Student Services building**.**

FASA advising & essay review by appointment—an appointment sign-up link will be available via directory email in mid-August.

- Send essay draft at least **3 business days before** your appointment & please note we do not proofread

Your research advisor & group

- especially if you are uncertain of which "field of study" you should apply under and/or which major area your research best fits

Review & refer to the GRFP website, FAQs, & Solicitation

Caltech

Deadlines

There is only one deadline for **you**, based on your "field of study" (see solicitation for breakdown).

- **October 15, 2024** Chemistry; Geosciences, Mathematical Sciences; Physics and Astronomy

- **October 16, 2024** Life Sciences

- **October 17, 2024** Engineering

- **October 18, 2024** Computer and Information Science and Engineering; Materials Research; Psychology; Social, Behavioral and Economic Sciences, STEM Education and Learning

Caltech

Deadlines (cont'd)

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

References due by Oct. 11, 5 pm ET, 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

caltech.edu