



# NSF Graduate Research Fellowship (GRFP)

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## What is the GRFP?

Goals:

1. Recognize & support early-career scientists with high potential for significant achievement.
2. Broaden participation in STEM fields.

## Videos

[https://www.nsf.gov/news/news\\_images.jsp?cntn\\_id=130974&org=NSF](https://www.nsf.gov/news/news_images.jsp?cntn_id=130974&org=NSF)



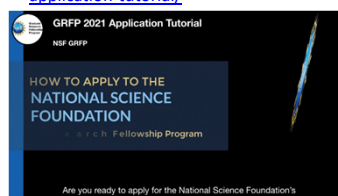
[https://www.youtube.com/watch?v=unXO\\_fhLeys](https://www.youtube.com/watch?v=unXO_fhLeys)



<https://nsgrfp.org/wp-content/uploads/2021/08/GRFP-Overview-and-Application-Outreach-July-2021.pdf>



<https://www.nsfgrfp.org/applicants/grfp-application-tutorial/>



## What is the GRFP?

In a 5-yr period

- 3 years of full graduate support
- \$138,000 (\$34,000/yr stipend plus tuition+fees)
- Career-life balance support possible
- 2100 awards; ~12,000 applicants 2022, 18% funding rate

Eligibility

- US Citizen, national, or permanent resident
- Have not completed any grad degree by Aug 1 of the submission year unless (1) joint BS/MS program and no additional grad work; (2) At least 2 years off.
- **NO** MD/PhD, JD/PhD, Management, Social work;
- **NO** support for clinical research, health services

# When should I apply?

Senior undergraduates  
Post-baccalaureates who have not started grad school  
Must be prepared to enroll the fall after you receive the award

**APPLY!**

First year graduate students

Apply only if highly competitive against other first AND second years

Fall of your second year grad school

**Last shot - APPLY!**

Highly competitive = demonstrates high potential to make significant achievements in STEM

- Past achievements predict future success
- GPA, awards, research experience, letters, great essays, clear past broader impacts and plans for future broader impacts of your work.
- Publications, presentations definitely help

# How to apply

Fastlane: <https://www.fastlane.nsf.gov/grfp/Login.do>

How to register

Accessing sections of the application

The screenshot displays the NSF Graduate Research Fellowship Program (GRFP) website. The main content area includes a 'Welcome to the NSF Graduate Research Fellowship Program (GRFP)' message, followed by a link to 'NSF GRFP Competition Results' and a link to 'Award Offers and Renewal Waiver List'. A red circle highlights the 'Applicant Deadlines' section, which lists deadlines for various fields: Life Sciences (October 19, 2020), Computer and Information Science and Engineering (October 20, 2020), Materials Research (October 20, 2020), Psychology (October 20, 2020), Social Sciences (October 20, 2020), STEM Education and Learning (October 20, 2020), Engineering (October 21, 2020), Chemistry (October 22, 2020), Geosciences (October 22, 2020), Mathematical Sciences (October 22, 2020), and Physics and Astronomy (October 22, 2020). Another red circle highlights the 'Log In' button for Applicants and Fellows. The page also includes a 'Quick Links' sidebar and a 'Log In for GRFP Officials' section.

# Fastlane

Prepare Application

▶ INSTRUCTIONS  
 ▶ PERSONAL INFORMATION  
 ▶ EDUCATION AND WORK EXPERIENCE  
 ▶ PROPOSED FIELD OF STUDY  
 ▶ PROPOSED GRADUATE STUDY  
 ▶ REFERENCES  
 ▶ PERSONAL, RELEVANT BACKGROUND AND FUTURE GOALS STATEMENT  
 ▶ GRADUATE RESEARCH PLAN STATEMENT  
 ▶ NSF GREP PROGRAM INFORMATION  
 ▼ SUBMIT APPLICATION

[Privacy Act Notice](#)  
 \* Required Field

## Personal information, education, work experience

"The easy stuff"

Add details to make your achievements clear

## Proposed field of study

Choose carefully, and consult your advisors!

## Transcripts

Grades count; GREs do not

## 3 letters of recommendation (VERY IMPORTANT!)

## Personal, relevant background & future goals (3 pp.)

Tell your story; concrete details discuss individual research experienced; craft a coherent and integrated whole, not a list

## Graduate research plan statement (2 pp.)

Demonstrate ability to plan and conduct research; why is it original, important, innovative? Future steps? Alternate interpretations?

## 2020 GRFP deadlines

All applications are due at **5:00 p.m. local time, based on applicant's mailing address.**

**October 17, 2022**

Life Sciences

**October 18, 2022**

Computer and Information Science and Engineering

Materials Research

Psychology

Social Sciences

STEM Education and Learning

**October 20, 2022**

Engineering

**October 21, 2022**

Chemistry

Geosciences

Mathematical Sciences

Physics and Astronomy

**October 28, 2022**

Reference letter deadline

## Selection Criteria

What is the potential of 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**)?

Rating: Excellent; Very Good; Good; Fair; Poor

**MUST be strong under BOTH criteria;  
Labelled Intellectual Merit and Broader Impact  
statements must be in each essay**

## Intellectual Merit

Definition: The potential to advance knowledge

Considers: Creativity, originality

Personal Statement: Evidence of prior achievement, personality, recognition

*convince reviewers that you have intellectual merit*

Research Statement: Importance and relevance of the proposed work

*convince reviewers that your proposed research outcomes have intellectual merit*

## Broader Impacts

Definition: Potential to benefit society or advance desired societal outcomes

Personal Statement: Evidence of prior engagement or interest relevant to your proposed plan

*show reviewers that you have experiences and qualifications that contribute to your ability to carry out your plan, and sincere commitment to its outcome*

Research Statement: Detail your Broader Impacts plan in a way that naturally flows from some aspect of the research plan

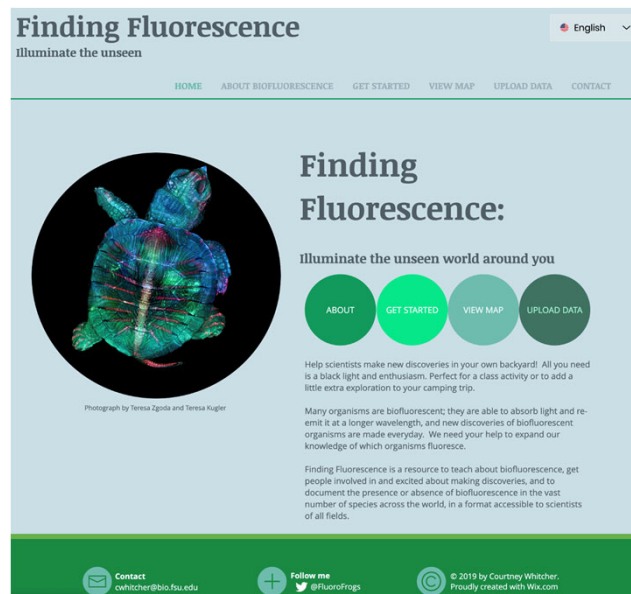
*convince reviewers that you can and will carry out your BI plan, and that it will effectively accomplish something that meets the description of at least one of the major 5 types of broader impacts.*

## Fatal Flaws (Advice from a Panelist)

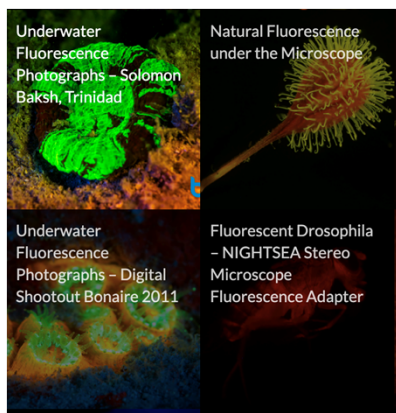
Panelists advised to weight Intellectual Merit and Broader Impacts *equally*

- Weak *history* of Broader Impacts (in Personal Statement)
- Weak *future* plan for Broader Impacts related to proposed research (in Research Statement)
- Too vague of Broader Impacts—need both specific history (not laundry list, but a story) and specific future plan
- Too mundane of Broader Impacts
- Too much overly personal information or too negative in Personal Statement
- Weak Intellectual Merit in Research Statement

## Broader Impacts Ideas



## Broader Impacts: Science Education



**Finding Fluorescence**  
illuminate the unseen

HOME ABOUT BIOFLUORESCENCE GET STARTED YOUR TEAM OFFICIAL DATA CONTACT

### What is biofluorescence?

Biofluorescence is a trait of an organism (any living thing) where light that hits the organism is re-emitted at a longer wavelength. When you stand under a blacklight at a bowling alley or in a haunted house and your white shirt and shoe laces glow bright, that is fluorescence. When you see this in an animal, it is called biofluorescence. To understand biofluorescence, we must understand the difference between biofluorescence and bioluminescence.

**HOW TO GLOW**

**The Science of Biofluorescence**

Biofluorescence is a great example of how all three main sciences interact. This makes biofluorescence an ideal tool for teaching and learning about science. Let's examine the biological, chemical, and physical properties of biofluorescence.

Biology	Chemistry	Physics
Biofluorescence has been examined in a range of species including insects, plants, fish, reptiles, and amphibians. Fluorescence has been found to act in sexual attraction (bees and flowers, birds, spiders), intraspecific recognition (cicadas), camouflage (reef fishes), and signals of condition (bees, fruits, mammals). Here are a few organisms that fluoresce; watch the image below to see the reveal of their biofluorescence.	Biofluorescence is the result of natural fluorophores (chemicals that fluoresce). There are many natural fluorophores, all organic chemicals with their own fluorescent emission wavelength. Here are a few examples of some of the chemicals underlying the fluorescence we see in living organisms.	Biofluorescence is the result of absorbed light being re-emitted at a longer wavelength due to fluorophores. The wavelength of light determines if we can see it and what color it appears as. Fluorescence shifts this wavelength to a new color.
What do you notice about the differences in how each organism "glows"? Why might these differences exist?	What similarities and differences exist between the structures of the fluorophores? Do you recognize any of the names? Where have you heard them before?	Here the wavelengths of light visible to humans are labeled. Some organisms can also see wavelengths in the ultraviolet range.

Which aspect of biofluorescence is your favorite? The interaction of biology, chemistry, and physics is necessary for biofluorescence to occur. This characteristic and its widespread nature make it relevant to a large number of researchers and allows for collaboration across scientific fields. Because biofluorescence is often invisible to human eyes without special equipment, many organisms have yet to be tested for fluorescence. Visit the Get Started tab for ways YOU can help scientists make discoveries of biofluorescence and ways to utilize biofluorescence as a tool for teaching science in your classroom.

## Broader Impacts: K-12 Activities

**Lab Activities for Classrooms**

Biofluorescence provides a unique opportunity to teach and learn about the three main topics of science (biology, chemistry, and physics) in one lesson. Find downloadable worksheets linked below. These can be used in the classroom or at home. Check back often as new modules are continually added and being expanded upon to provide resources for students of all ages.

Use the language menu at the top of the page to visit the Spanish version of the site and download the worksheets below in Spanish.

**Classroom Resources**

**MODULES:**

- [Biology of Biofluorescence Worksheet](#)
- [Chemistry of Biofluorescence Worksheet](#)
- [Physics of Biofluorescence Worksheet](#)
- [Finding Fluorescence Lab](#)

**FINDING FLUORESCENCE LAB**

**Before you go out:**

What do you think you will see when you go out?

What do you think you will see when you go out?

What do you think you will see when you go out?

**After you go out:**

What do you think you will see when you go out?

What do you think you will see when you go out?

What do you think you will see when you go out?

**Design an Experiment**

What do you think you will see when you go out?

What do you think you will see when you go out?

What do you think you will see when you go out?



# Bonus Material

To assess Intellectual Merit and Broader Impacts, Panelists are instructed to consider:

To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

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?

## Broader Impacts

**Advance discovery and understanding while promoting teaching, training, and learning**, for example, by training graduate students, mentoring postdoctoral researchers and junior faculty, involving undergraduates in research experiences, and participating in the recruitment, training, and professional development of K-12 mathematics and science teachers.

**Broaden participation of under-represented groups**, for example, by establishing collaborations with students and faculty from institutions and organizations serving women, minorities, and other groups under-represented in the mathematical sciences.

**Enhance infrastructure for research and education**, for example, by establishing collaborations with researchers in industry and government laboratories, developing partnerships with international academic institutions and organizations, and building networks of U.S. colleges and universities.

**Broaden dissemination to enhance scientific and technological understanding**, for example, by presenting results of research and education projects in formats useful to students, scientists and engineers, members of Congress, teachers, and the general public.

**Benefits to society** may occur, for example, when results of research and education projects are applied to other fields of science and technology to create startup companies, to improve commercial technology, to inform public policy, and to enhance national security.

## Encouragement

Awardees are not composed of only Ivy League superstars!

Diversity is an asset: students from rural areas, underrepresented groups, disabled, economically-disadvantaged, first generation college or graduate student, financial challenges

Talk about these things in your personal statement!

Applicants who have overcome major challenges and persevered are likely to succeed—write about your experience