



NSF Graduate Research Fellowship (GRFP)

Emily Lemmon Department of Biological Science

What is the GRFP?

Goals:

 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.youtube.com/watch?v=unXO_fhLeys



NSF Graduate Research Fellowship Overview 2018 from ASEE on Vimeo.

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)
- GROW (International study for NSF GRFP Fellows)
- **GRIP** (Federal internships for NSF GRFP Fellows)
- INTERN (Non-academic research internships for NSF GRFP Fellows)
- Career-life balance support possible

2000 awards; ~12,000 applicants in 2018, 15-16% 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

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!

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

How to register Accessing sections of the application



Graduate Research Fellowship Program (GRFP)

Graduate Research Fellowship Program

Welcome to the NSF Graduate Research Fellowship Program (GRFP).

NSF GRFP Competition Results

Applicant Deadlines

Quick Links

Program Solicitation

Administrative **Guide for Fellows** and CO's

GRFP Application FAQs

Application Guidelines

Institution Directory

Award Offers and Honorable Hontions List Applications Must Be Received by 5:00 p.m. Local Time of applicant's mailing address October 19, 2020 (Monday): Life Scie October 20, 2020 (Tuesday): Computer and Information Science and Engineering October 20, 2020 (Tuesday): Materials Research October 20, 2020 (Tuesday): Psychology October 20, 2020 (Tuesday): Social Sciences October 20, 2020 (Tuesday): STEM Education and Learning October 21, 2020 (Wednesday): Engineering October 22, 2020 (Thursday): Chemistry October 22, 2020 (Thursday): Geosciences October 22, 2020 (Thursday): Mathematical Sciences October 22, 2020 (Thursday): Physics and Astronomy Withdrawal Deadline November 15, 2020 (Sunday): Application Withdrawal

Reference Submission Deadline

Reference Letters Must Be Submitted by 4:00 p.m. (Eastern Time) on October 30, 2020 (Friday) Reference Writers, please note: You will be provided a new login to submit a reference letter.

October 30, 2020 (Friday): Submit Reference Letter.

Accessibility Assistance

If you require accessibility assistance to prepare your application, please notify GRF Operations Center well at least two weeks in advance of the deadline dates

Applicant and Reference Writer Assistance



Research.gov Help

Fastlane

Prepare Application

> INSTRUCTIONS
PERSONAL IN ORMATION
EDUCATION AND WORK EXPERIENCE
PROPOSED FIELD OF STUDY
PROPOSED GRADUATE STUDY
<u>REFERENCES</u>
PERSONAL, RELEVANT BACKGROUND AND FUTURE GOALS STATEMENT
GRADUATE RESEARCH PLAN STATEMENT
NSF GRFP PROGRAM INFORMATION
V 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

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 19, 2020

Life Sciences

October 20, 2020

Computer and Information Science and Engineering

Materials Research

Psychology

Social Sciences

STEM Education and Learning

October 21, 2020

Engineering

October 22, 2020

Chemistry

Geosciences

Mathematical Sciences

Physics and Astronomy

October 30, 2020

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 <u>must</u> 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 <u>you</u> have intellectual merit*

Research Statement: Importance and relevance of the proposed work *convince reviewers that <u>your proposed research</u> <i>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 <u>you</u> have experiences and qualifications that contribute to your ability to carry out your plan, and sincere commitment to its outcome

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

convince reviewers that <u>you can and will</u> 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

Finding Fluorescence

Illuminate the unseen



Finding Fluorescence is a resource to teach about biofluorescence, get people involved in and excited about making discoveries, and to document the presence or absence of biofluorescence in the vast number of species across the world, in a format accessible to scientists of all fields.



Contact cwhitcher@bio.fsu.edu



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Broader Impacts: Science Education



Photographs – Digital Shootout Bonaire 2011 Fluorescent Drosophila – NIGHTSEA Stereo Microscope Fluorescence Adapter **Finding Fluorescence**

Illuminate the unseen

HOME ABOUT BIOFLUORESCENCE GET STARTED VIEW MAP UPLOAD DATA CONTACT

What is biofluorescence?

Biofluorescene 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 call biofluorescence. To understand biofluorescence, we must understand the difference between biofluorescence and bioluminescence.



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), intraspecies recognition (copepods), camouflage (reef fishes), and signals of condition (leaves, 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 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. Excitation and Emission Spectral Profiles Georgian Maximum Spectral Fluorescence shifts this wavelength to a new color. For the wavelength of the spectral Biofluorescence shifts this share the wavelength of light visible to humans are labeled. Some organisms can also see wavelengths in the ultraviolet range.
differences in how each organism "glows?" Why might these differences exist?	Do you recognize any of the names? Where have you heard them before?	

Which aspect of biolfuorescence 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 biofluorescene 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.



MODULES:

- Biology of Biofluorescence Worksheet
- <u>Chemistry of Biofluorescence Worksheet</u>
- <u>Physics of Biofluorescence Worksheet</u>
- <u>Finding Fluorescence Lab</u>

FINDING FLUORESCENCE	E LAB
Intro Intro Intro Intro	
Before you go out: aastons to you have?	
fl you know if you are seeing fluorescence?	
ings do you think will have fluorescence?	
der do you think will glow under your light?	
After you go out:	
on-living objects did you find that are fluorescent?	
you think they might be flubrascent?	
ganiams did you find that are fluorescent?	
you think they might be fluorescent?	Design an Experiment
	After your induit observations, design an experiment to text a question inspired by what you abserved. Think through how you will text this question and what insights the answers might provide.
2 2	Question
	222708
	Hypothesis
	Staturals and Methods:
	Peoulder Outcomes and Implications:

Broader Impacts: Citizen Science

Finding Fluorescence Observation of Fluorescence -



Finding Fluorescence

Illuminate the unseen

+

Total: 32

HOME ABOUT BIOFLUORESCENCE GET STARTED VIEW MAP UPLOAD DATA CONTACT

🍨 English

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Explore the data that people around the world just like you have uploaded. There are list and map forms of entry display. Below is the list form of the data. You can use the filter function to view entries by title and location. Click the three lines at the top right corner and select "MAP" to switch to a map view of the entries. Take note of areas near you not yet surveyed and help us grow our reach!

If you wish to use any of the data, please cite the Finding Fluorescence database as below. Finding Fluorescence. (2019). Finding Fluorescence: Observation of Fluorescence. Retrieved from https://findingfluorescence.wixsite.com

Finding Fluorescence Observation of Fluorescence

Iter by title				FROM: 28 OCT, 19	TO: 03 NOV, 20	03 NOV, 20 NEWEST -	
View	Title	Created At	Date	Time	Loc	ation	
0	cb7f11a0-1de9-11eb	3rd Nov, 2020	08/15/2020	09:10	30.	202929, -84.229	97
0	4e91b710-1de9-11eb	3rd Nov, 2020	08/15/2020	09:10	30.	30.202929, -84.22979	
0	Mediterranean gecko	22nd Sep, 2020	09/22/2020	21:24	30.	474975, -84.311	.05
0	Caterpillar	21st Sep, 2020	09/20/2020	21:30	53.	211112, 6.58298	37
0	Lichen?	21st Sep, 2020	09/20/2020	21:15	53.	211124, 6.5828	36
	Moth	15th Sep. 2020	09/15/2020	17:40	53.	211078. 6.5754	41

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 wellreasoned, 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!

<u>Diversity is an asset</u>: 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