

Exhibit 66

DECLARATION OF JUDITH SIMCOX

I, Judith Simcox, declare under the penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct:

1. I am an Assistant Professor at the University of Wisconsin-Madison (“UW-Madison”). I am over the age of 18 and have personal knowledge of all the facts stated herein, including knowledge based on my experience and information provided to me. If called as a witness, I could and would testify competently to the matters set forth below.

2. I submit this Declaration in support of the Plaintiff States’ Motion for Preliminary Injunction.

Professional Background

3. I have been an Assistant Professor for six years, starting my research laboratory at UW-Madison in 2019. My laboratory measures fat molecules, known as lipids, in human plasma to identify how these lipids contribute to heart failure and to determine how these lipids are regulated. We measure these lipids in populations that have higher rates of heart failure than the general population, including Native Americans, African Americans, and people with secondary diseases such as type 1 diabetes. Beyond my teaching and research roles, I also serve as the co-Director for the Center for Indigenous Research to Create Learning Excellence (“CIRCLE”). CIRCLE was founded to increase the retention of Native American graduate students. In the U.S., Native Americans account for only 0.4% of master and doctoral students in the science, technology, engineering, and math (“STEM”) fields even though they make up 2.9% of the population. Of these Indigenous graduate students, only 36% will go on to complete their graduate studies. My research laboratory and work as co-Director for CIRCLE were built upon the

foundation of my postdoctoral and graduate work. In my postdoctoral studies, I identified how the lipids that regulate type 2 diabetes are produced and affect thermogenic energy expenditure, or heat production. As a graduate student at the University of Utah, I studied how dietary iron controls glucose regulation and diabetes. During my graduate studies I helped build and found the Native American Research Internship (“NARI”) at the University of Utah. Since its start in 2010, NARI has brought 158 students that represent 48 different Tribes to the University of Utah for a summer undergraduate research experience. Of these students, 87% have completed their bachelor’s degree, compared to the national average of all U.S. undergraduates, where fewer than 40% complete a STEM degree. From NARI participants, 31% have gone on to medical school, 26% have gone on to graduate school, and 33% have gained employment in biomedical research fields. This represents a significant advancement compared to the national average of 1% of Native students pursuing graduate degrees in science.

4. At UW-Madison, I lead biochemistry research focused on understanding how lipids play a role in heart failure and regulate energy expenditure. My research group is currently comprised by 15 researchers that include graduate students, undergraduates, and postdoctoral fellows. Since starting my lab in 2019, two of my graduate students have been funded by National Science Foundation (“NSF”) Graduate Research Fellowships and I have been the principal investigator on NSF Innovations in Graduate Research programs. These projects were funded during both Democratic and Republican presidential administrations. My NSF-funded research has included understanding how lipids that cause diabetes function, how specific kinds of lipids that cause neurodegenerative disease are regulated, and effective strategies to recruit and support Native American graduate students through mentorship. Our work with Native American graduate students increases our ability to explore metabolic disease and understand its

regulation. It has also been important for supporting Native American participation in innovative research topics that include agricultural farming practices, water contamination and management, antibiotic resistance, chemical engineering, and geographical features that predict energy deposits for fuel production. Prior to April 18 of this year, I was serving as the principal investigator or mentor for three active projects funded by NSF grants.

Projects Affected by NSF Priority Changes

5. On April 25, 2025, NSF provided notice that it had terminated my active grant, NSF Award ID# 2429717. The project title associated with award number 2429717 is “Cultivating an Indigenous Graduate Research Environment to Enhance Retention and Scientific Careers.”

6. On August 5, 2024, NSF issued an award notice for award number 2429717 with a total intended award amount of \$999,864. That document is attached as Exhibit A.

7. The fundamental purpose of the project funded by this award is to promote increased participation in STEM fields by Native American scientists, but the program is open to all graduate students interested in working with Native American populations and Tribes.

8. The project advances that purpose by building and implementing the objectives of CIRCLE, which develops, implements, and experiments with mentorship approaches to support Native American graduate students. CIRCLE performs mentorship training, programmatic assessment, hosts Indigenous Research Forums open to all researchers who work with Indigenous communities, and provides tailored mentorship to graduate students. CIRCLE also works with Tribal Colleges, rural high schools, Native American Elders Associations, and Tribes to bolster participation in research and generate the next generation of researchers. CIRCLE

performs research on and implements mentorship practices that improve retention of Native American Graduate students including assignment of community, cultural and academic mentors. CIRCLE also performs biannual surveys, data analysis on the results, and executes mentorship training based on the results of the surveys. CIRCLE also hosts community events including the Indigenous Research Forum, a weekly research-in-progress talk series, and professional development workshops. Finally, CIRCLE funds projects by graduate students working with Tribal Colleges, rural high schools that have a high concentration of Native American students, Native American Elders Associations, and Tribes. These projects include innovations in agricultural farming practices, water contamination and management, antibiotic resistance, chemical engineering, and geographical features that predict energy deposits on Tribal lands.

Funding History for Terminated Grant

9. Funding for my award was initially requested by an application on April 22, 2024, to NSF's Innovations in Graduate Education program. The application was processed by NSF and selected for funding as described above. The program solicitation to which our application responded is attached as Exhibit B.

10. In my experience, and as stated in NSF's Proposal & Award Policies and Procedures Guide, all proposed projects submitted to NSF are evaluated for both intellectual merit and broader societal impacts, and must score highly in both areas to be considered for funding.

11. The original term of funding under award number 2429717 was for the period between October 1, 2024, and September 30, 2028.

12. As of April 25, 2025, UW-Madison had drawn \$32,915.68 of the total intended award amount. This left an anticipated disbursement of \$966,948.32 over the remaining life of the award.

Termination Notice

13. In my experience, termination of an active project's funding is rare, and I have never had a project's funding terminated. Since starting my research career, I have been funded by the National Institutes of Health, NSF, and several private foundations including the American Heart Association, Breakthrough T1D, and the American Federation for Aging Research with all of these grants being funded to completion until now. To my knowledge, prior to 2025, termination has only occurred in cases of scientific or budgetary misconduct, typically with prior notice and opportunities to respond and correct any underlying issues.

14. Nevertheless, on April 25, 2025, NSF sent a notice to UW-Madison that award number 2429717 was terminated. That notice is attached as Exhibit C. I am aware that NSF also sent many other notices terminating projects around the nation on the same date. This is unprecedented in my experience with NSF.

15. The notice terminating award number 2429717 came without any previous process or communication about the project from NSF. The notice contains little explanation for the termination, and no explanation with respect to the intellectual merit or broader impact of the underlying project. The notice recites that "termination of certain awards is necessary because they are not in alignment with current NSF priorities" and continues:

NSF is issuing this termination to protect the interests of the government pursuant to NSF Grant General Conditions (GC-1) term and condition entitled 'Termination and Enforcement,' on the basis that they no longer effectuate the

program goals or agency priorities. This is the final agency decision and not subject to appeal.

16. The termination notice included a link to an NSF website saying that it was terminating awards “on diversity, equity, and inclusion (DEI) and misinformation/disinformation.” The website further stated that “research on broadening participation, must aim to create opportunities for all Americans everywhere.” My understanding is that one of NSF’s specific purposes is to promote participation in STEM fields by women, minorities and people with disabilities. More broadly, I understand that NSF’s purpose is to support scientific and engineering research and education. As described in paragraph 8 above, my project advances those goals. NSF recognized as much when, after careful consideration in its ordinary process, it approved funding for the project.

Harms from NSF Funding Terminations

17. The termination of award number 2429717 by NSF has resulted in the immediate shutdown of the CIRCLE program.

18. As a result, this termination has damaged our relationships with the Tribes due to an inability to deliver on CIRCLE scholar projects that were selected for funding. These include work with the Tribal Elder Food Box Program that distributes food to Tribal Elders through the State of Wisconsin to ensure food security, outreach work with rural high schools to bring students to the UW-Madison campus, and outreach for Indigenous Health and Wellness Day, which brings students to the UW-Madison campus from rural high schools to explore careers in health care and science. Terminating the project also puts a lag in the implementation of CIRCLE’s survey work and hosting of the Indigenous Research Forums, and it prevents

dissemination of mentorship materials through the year. Collectively this loss will set back efforts to encourage participation of Native American researchers in STEM, limiting our efforts to improve upon and expand the STEM workforce, particularly in rural communities.

19. In addition, the grant covered salary for a postdoctoral researcher leading the data analysis and program development for CIRCLE, the director of UW-Madison's Native American Center for Health Professions (NACHP), and a graduate student to complete the data analysis of CIRCLE surveys. UW-Madison has no alternative funds to cover the salaries of the postdoc and graduate student. Thus, loss of funding has necessitated the resignation of the postdoc and will lead to loss of employment opportunities that build off of this project experience. Moreover, the graduate student has needed to switch to a different project with a new study team, disrupting progress to their degree, which will inevitably cause a delay in completing their degree. While the UW-Madison School of Medicine and Public Health will make up the NACHP director's lost salary, this comes at the expense of other programs and initiatives that could have otherwise used those funds, and the school does not have sufficient funds to make up the other lost payrolls.

20. If funding is not promptly restored, there is no way to recover lost time or restore research continuity, relationships with Tribal partners may be damaged to the point where they no longer wish to collaborate in future endeavors, and staff who depart will take their knowledge and expertise with them, requiring new investment in training.

Conclusion

21. The mass termination of previously approved NSF grants based on purported new priorities will undermine the NSF's mission to support science, engineering and mathematical education and research. Targeting projects like mine that specifically promote participation in

STEM by underrepresented groups including Native Americans will close pathways to bring more people into the STEM workforce. Grant terminations make it harder to secure talent needed to continue effective research efforts. These harms are ongoing and, in many instances, irreparable.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed this 16th day of May, 2025, in Madison, Wisconsin.

A handwritten signature in black ink, appearing to read "Judith A. Simcox", written in a cursive style.

Judith Simcox
Assistant Professor of Biochemistry
Co-Director CIRCLE

WI Decl. of Simcox, Ex. A
5.16.2025

From: lfarrior@nsf.gov
To: [RSP - NSF](#)
Cc: ajjenkin@nsf.gov; bfair@nsf.gov; catwilli@nsf.gov; ccruz@nsf.gov; ddenecke@nsf.gov; [Judith Simcox](#); lchester@nsf.gov; lhollowa@nsf.gov; rccraven@nsf.gov; snclark@nsf.gov; spatters@nsf.gov; tyable@nsf.gov
Subject: NSF Award Notice for Award ID 2429717 - Amendment ID 000
Date: Monday, August 5, 2024 5:31:17 AM

NATIONAL SCIENCE FOUNDATION

Award Notice

Award Number (FAIN): 2429717

Managing Division Abbreviation: DGE

Amendment Number: 000

RECIPIENT INFORMATION

Recipient (Legal Business Name): UNIVERSITY OF WISCONSIN SYSTEM

Recipient Address: 21 N PARK ST STE 6301 MADISON, WI 53715-1218

Official Recipient Email Address: nsf@rsp.wisc.edu

Unique Entity Identifier (UEI): LCLSJAGTNZQ7

AMENDMENT INFORMATION

Amendment Type: New Project

Amendment Date: 08/05/2024

Amendment Number: 000

Proposal Number: 2429717

Amendment Description:

The National Science Foundation hereby awards a Standard Grant for support of the project described in the proposal referenced above as modified by revised budget dated 07/19/2024.

Costs of entertainment, amusement, diversion and social activities, and any costs directly associated with such activities (such as meals, lodging, rentals, transportation and gratuities) are unallowable. When certain meals are an integral and necessary part of a conference or meeting (i.e., working meals where business is transacted), grant funds may be used for such meals. Grant funds may also be used to furnish a reasonable amount of coffee or soft drinks for conference or meeting participants and attendees during coffee breaks.

No NSF funds may be spent on meals or coffee breaks for intramural meetings of an organization or any of its components, including, but not limited to, laboratories, departments and centers.

AWARD INFORMATION**Award Number (FAIN):** 2429717**Award Instrument:** Standard Grant**Award Date:** 08/05/2024**Award Period of Performance:** Start Date: 10/01/2024 End Date: 09/30/2028**Project Title:** IGE: Track 2: Cultivating an Indigenous Graduate Research Environment to Enhance Retention and Scientific Careers**Managing Division Abbreviation:** DGE**Research and Development Award:** Yes**Funding Opportunity:** NSF 24-529 Innovations in Graduate Education (IGE)**Assistance Listing Number(s) and Name(s):** 47.076 Education and Human Resources (Predominant source of funding for SEFA reporting)**FUNDING INFORMATION****Amount Obligated by this Amendment:** \$999,864**Total Intended Award Amount:** \$999,864**Total Approved Cost Share or Matching Amount:** \$0**Total Amount Obligated to Date:** \$999,864**Expenditure Limitation:** Not Applicable**PROJECT PERSONNEL****Principal Investigator:**
Judith Simcox**Email:**
jsimcox@wisc.edu**Organization:** UNIVERSITY OF
WISCONSIN SYSTEM**NSF CONTACT INFORMATION****Managing Grants Official**
(Primary Contact)**Name:** Denisa Traboini**Email:** dtraboin@nsf.gov**Phone:** (703) 292-4916**Awarding**
Official**Name:** LeVar R.
Farrior**Email:**
lfarrior@nsf.gov**Managing Program Officer****Name:** Daniel Denecke**Email:** ddenecke@nsf.gov**Phone:** (703) 292-8072**GENERAL TERMS AND CONDITIONS**

This is awarded pursuant to the authority of the National Science Foundation Act of 1950, as amended (42 U.S.C. 1861-75) and is subject to Research Terms and Conditions (RTCs) dated 11/12/2020, and NSF Agency Specific Requirements, dated 05/20/2024, available at <https://www.nsf.gov/awards/managing/rte.jsp>.

This institution is a signatory to the Federal Demonstration Partnership (FDP) Phase VI Agreement which requires active institutional participation in new or ongoing FDP demonstrations and pilots.

This award is made in accordance with the provisions of NSF Solicitation: NSF 24-529 Innovations in Graduate Education (IGE).

BUDGET

A. Senior Personnel	
Senior Personnel Count	16.00
Senior Personnel Calendar Months	18.40
Senior Personnel Academic Months	0.00
Senior Personnel Summer Months	0.00
Senior Personnel Amount	\$144,768
B. Other Personnel	
Post Doctoral Scholars	
Post Doctoral Count	0.00
Post Doctoral Calendar Months	0.00
Post Doctoral Academic Months	0.00
Post Doctoral Summer Months	0.00
Post Doctoral Amount	\$0
Other Professionals	
Other Professionals Count	0.00
Other Professionals Calendar Months	0.00
Other Professionals Academic Months	0.00
Other Professionals Summer	

Months	0.00
Other Professionals Amount	\$0
Graduate Students	
Graduate Students Count	0.00
Graduate Students Amount	\$0
Undergraduate Students	
Undergraduate Students Count	0.00
Undergraduate Students Amount	\$0
Secretarial - Clerical	
Secretarial - Clerical Count	4.00
Secretarial - Clerical Amount	\$104,591
Other	
Other Count	0.00
Other Amount	\$0
<i>Total Salaries and Wages (A+B)</i>	\$249,359
C. Fringe Benefits	\$97,342
<i>Total Salaries, Wages, Fringe Benefits (A + B + C)</i>	\$346,701
D. Equipment	\$0
E. Travel	
Domestic	\$4,400
International	\$0
F. Participant Support Costs	
Participant Support Costs Stipends	\$0
Participant Support Costs Travel	\$0
Participant Support Costs Subsistence	\$0
Participant Support Costs	\$0

Other	
Total Number of Participants	0.00
<i>Total Participant Costs (F)</i>	\$0
G. Other Direct Costs	
Materials Supplies	\$0
Publication Costs	\$0
Consultant Services	\$0
Computer Services	\$0
Subawards	\$0
Other	\$291,900
<i>Total Other Direct Costs (G)</i>	\$291,900
H. Total Direct Costs (A Through G)	\$643,001
I. Indirect Costs*	\$356,863
J. Total Direct and Indirect Costs (H + I)	\$999,864
K. Fees	\$0
L. Total Amount of Request (J) OR (J + K)	\$999,864
M. Cost Sharing Proposed Level	\$0

*Indirect Cost Rates

Item Name	Indirect Cost Rate
MTDC	55.5000%

These rates are at the time of award and are based upon the budget submitted to the NSF. It does not include any out-year adjustments. The NSF will not modify awards simply to correct indirect cost rates cited in the award notice. See the Proposal & Award Policies & Procedures Guide (PAPPG) Chapter X.A.3.a. for guidance on re-budgeting authority.

WI Decl. of Simcox, Ex. B
5.16.2025

NSF 24-529: Innovations in Graduate Education (IGE)

Program Solicitation

Document Information

Document History

- **Posted:** January 24, 2024
- **Replaces:** [NSF 20-595](#)

[View the program page](#)



National Science Foundation

Directorate for STEM Education

Division of Graduate Education

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

April 22, 2024

March 25, 2025

March 25, Annually Thereafter



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Important Information And Revision Notes

With this solicitation, the IGE program will support proposals in two tracks: Track 1: Career Preparation and Student Success Pilots and Track 2: Systemic Interventions and Policies. Under Track 1, the IGE program will continue to invite proposals to pilot, test, and validate innovative approaches to graduate education with an emphasis on career preparation and student success. Track 2 is new with a primary goal to support research on how various systemic innovations in science, technology, engineering, and mathematics (STEM) graduate education impact graduate student outcomes (such as graduation rates, retention, employment, etc.).

Leadership teams (PI/Co-PIs) for both tracks are encouraged to include experts in education research, the learning sciences, and/or evaluation, as appropriate, as well as in the principal science domain(s), as needed, to design and implement a robust and appropriate research plan.

Proposals for the IGE Innovation Acceleration Hub are not being accepted through this solicitation.

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) that is in effect for the relevant due date to which the proposal is being submitted. The NSF PAPPG is regularly revised and it is the responsibility of the proposer to ensure that the proposal meets the requirements specified in this solicitation and the applicable version of the PAPPG. Submitting a proposal prior to a specified deadline does not negate this requirement.

Summary Of Program Requirements

General Information

Program Title:

Innovations in Graduate Education (IGE) Program

Synopsis of Program:

The Innovations in Graduate Education (IGE) Program is designed to encourage development and implementation of bold, new, and potentially transformative approaches to STEM graduate education training. The program seeks proposals that a) explore ways for graduate students in STEM master's and doctoral degree programs to develop the skills, knowledge, and competencies needed to pursue a range of STEM careers, or b) support research on the graduate education system and outcomes of systemic interventions and policies.

IGE projects are intended to generate the knowledge required for the customization, implementation, and broader adoption of potentially transformative approaches to graduate education. The program supports

piloting, testing, and validating novel models or activities and examining systemic innovations with high potential to enrich and extend the knowledge base on effective graduate education approaches.

The program addresses both workforce development, emphasizing broad participation, and institutional capacity-building needs in graduate education. Strategic collaborations with the private sector, non-governmental organizations (NGOs), government agencies, national laboratories, field stations, teaching and learning centers, informal science organizations, and academic partners are encouraged.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Daniel Denecke, telephone: (703) 292-8072, email: ddenecke@nsf.gov
- Karen McNeal, telephone: (703) 292-2138, email: kmcneal@nsf.gov
- Elizabeth A. Webber, telephone: (703) 292-4316, email: ewebber@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.076 --- STEM Education

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 16 to 20

IGE Track 1 Awards (6 to 10 anticipated in FY 2024) are expected to be up to three (3) years in duration with a total budget between \$300,000 and \$500,000.

IGE Track 2 Awards (6 to 12 anticipated in FY 2024) are expected to be up to five (5) years in duration with a total budget up to \$1,000,000.

The estimated number of awards and the anticipated funding amounts listed above for both Track 1 and Track 2 are for FY 2024. The number of awards and funding amounts in FY 2025 and FY 2026 are subject to the availability of funds.

Anticipated Funding Amount: \$14,000,000

The anticipated funding amount of \$14,000,000 is for FY 2024.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.
- Non-profit, non-academic organizations: Independent museums, observatories, research laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.

- Tribal Nations: An American Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges as a federally recognized tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. §§ 5130-5131.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 2

An eligible organization may participate in two Innovations in Graduate Education proposals per annual competition. **Participation includes serving as a lead organization on a non-collaborative proposal or as a lead organization, non-lead organization, or subawardee on a collaborative proposal.**

Organizations participating solely as evaluators on projects are excluded from this limitation. Proposals that exceed the organizational eligibility limit (beyond the first two submissions based on timestamp) will be returned without review regardless of the organization's role (lead, non-lead, subawardee) in the returned proposal.

Limit on Number of Proposals per PI or co-PI: 1

An individual may serve as Lead Principal Investigator (PI) or Co-PI on only one proposal submitted to the IGE program per annual competition. Proposals that exceed the PI/Co-PI eligibility limit (beyond the first submission based on timestamp) will be returned without review regardless of the individual's role (PI or Co-PI) in the returned proposal.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
 - Full Proposals submitted via Research.gov: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
 - Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:**

Not Applicable
- **Other Budgetary Limitations:**

Not Applicable

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. submitter's local time):

April 22, 2024

March 25, 2025

March 25, Annually Thereafter

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria apply.

Award Administration Information

Award Conditions:

Standard NSF award conditions apply.

Reporting Requirements:

Standard NSF reporting requirements apply.

I. Introduction

Innovation in science, technology, engineering, and mathematics (STEM) graduate education is vital to meet the needs of science and society in the 21st century. There are multiple drivers for change including: (i) recent major national reports on the state of STEM graduate education, (ii) the accelerating pace of science and engineering discoveries and technological innovations, (iii) national STEM workforce trends, (iv) the growing globalization of science and engineering, and (v) calls to align graduate education practices and models with the needs of students and enhanced understanding of how people learn.^{1, 2, 3, 4, 5, 6, 7, 8, 9}

More recent drivers for innovation in STEM graduate education include heightened attention to (vi) graduate admissions policies, (vii) student mental health and wellness, and (viii) the potential uses of emerging technologies such as generative artificial intelligence (AI) and large language models^{10, 11, 12, 13}. There is increasing recognition, also, that addressing the grand challenges in science and engineering requires interdisciplinary and broad professional training, which is atypical for most graduate programs. Additionally, there is a growing body of evidence that diversity and inclusivity accelerate scientific innovation, hence there is a national need to identify and adopt practices that are effective in broadening participation in STEM graduate programs.¹⁴

To address this wide range of issues, innovation is needed at multiple levels and scales ranging from the interpersonal level of student-advisor and mentor-mentee relationships through the level of the graduate program to the broad systemic environment of policies and procedures. Improved understanding through research is particularly needed at this latter level about how large-scale interventions impact graduate student outcomes and that cut across programs, institutions, and disciplines. To identify effective innovations at all scales, the IGE program calls for new approaches to a) pilot, test, and validate innovative and effective STEM graduate education models and programming, and b) examine the systemic impact of new and recent innovations in graduate education policies, procedures, and interventions.

II. Program Description

The IGE program is dedicated to (a) piloting, testing, and validating innovative approaches to graduate education, and (b) supporting research on the graduate education system and rigorous examination of outcomes associated with systemic graduate education interventions and policies. The IGE program seeks to generate the knowledge required for the customization and implementation of the most successful, transformative approaches.

The goals of the IGE Program are to:

- Generate the knowledge base needed to inform the development of bold, new, and potentially transformative approaches to graduate education as well as their customization, implementation, and broader adoption.
- Catalyze rapid advances in STEM graduate education broadly as well in particular disciplinary and interdisciplinary STEM fields.

The IGE Program calls for proposals in two tracks to:

- Design, pilot, and test new, innovative and [transformative approaches](#) for inclusive STEM graduate education (Track 1);
- Examine the impact of innovative systemic policies, procedures, and interventions on graduate education outcomes (Track 2);
- Examine the potential to extend a successful approach developed in one discipline or context to other disciplines or contexts (Tracks 1 and 2);
- Develop approaches that are informed by learning science and the existing body of knowledge about STEM graduate education (Tracks 1 and 2).

The primary beneficiaries for all IGE research projects (Track 1 and Track 2) must be master's and/or doctoral students in STEM-designated degree programs. Eligible degree programs include research-based STEM master's and doctoral degree programs, Professional Science Master's programs and MEng programs with research training but do not include programs that only award certificates or professional degrees [such as Doctor of Audiology (AuD), Doctor of Dental Surgery (DDS), Doctor of Education (DEd), Doctor of Naprapathy (DN), Doctor of Nursing Practice (DNP), Doctor of Osteopathic Medicine (DO), Doctor of Podiatric Medicine (DPM), Doctor of Physical Therapy (DPT), Doctor of Science in Physical Therapy (DScPT), Juris Doctor (JD), Master of Liberal Arts (MLA), Doctor of Medicine (MD), Doctor of Naturopathic Medicine (ND), Doctor of Optometry (OD), Doctor of Occupational Therapy (OTD), Doctor of Pharmacy, (PharmD), Doctor of Psychology (PsyD), Doctor of Speech-Language Pathology (SLPD)].

IGE RESEARCH PROJECTS

With this solicitation, NSF invites proposals for two types of projects (described below):

Track 1: Career Preparation and Student Success Pilots: IGE supports projects that generate knowledge about new, potentially transformative improvements in graduate education and workforce development that prepare the next generation of scientists and engineers for the full range of possible STEM career paths to advance the nation's STEM enterprise.

Track 1 proposals focus on novel, pilot interventions in a single STEM program or at a single institution benefiting STEM students across multiple graduate programs. Track 1 will also support proposals examining the potential to extend a successful approach developed in one discipline or context to other disciplines or contexts. Examples of topics that Track 1 projects may address include, but are not limited to: student professional skill development; career preparation and vocational counseling; faculty training and faculty professional development; entrepreneurship; experiential and project-based learning; outreach and community engagement; international experiences; virtual networks; pedagogical innovations related to generative AI and large language models; personalized learning; STEM identity and belonging; and mentoring. Projects should address how the proposed approach would serve a broad population of students from diverse backgrounds.

Track 1 proposals may request a total budget (up to three years in duration) between \$300,000 and \$500,000.

Track 2: Systemic Interventions and Policies: IGE Track 2 awards support research projects that are expected to generate knowledge about the graduate education system and outcomes of systemic intervention and policies. IGE Track 2 projects may be implemented at different scales: within a field of study across multiple institutions and programs; across multiple fields of study within a single institution; or across multiple institutions and fields of study. Specifically encouraged are proposals that address one of the following six areas:

1. Funding models and funding mechanisms with a priority emphasis on studies on the effects of traineeships, fellowships, internships, and teaching and research assistantships on graduate student outcomes addressing differences by sex, race, ethnicity, and citizenship and student debt load.

2. Graduate student mental health and wellbeing with a priority emphasis on projects that include research, data collection, and assessment of the state of graduate student mental health and wellbeing, factors contributing to and consequences of poor graduate student mental health, and the development, adaptation, and assessment of evidence-based strategies and policies to support emotional wellbeing and mental health.

3. Mentoring policies, procedures, and models with a priority emphasis on studies of effects of graduate education and mentoring policies and procedures on degree completion, including differences by (i) sex, race and ethnicity, and citizenship; and (ii) student debt load.

4. Graduate research environments and teams with a priority emphasis on proposals to study differences in graduate research environments (e.g., academic, industry, government, hybrid; place-based; team vs. independent; formal and informal social supports) and associated outcomes or develop and assess new or adapted interventions, including approaches that improve mentoring relationships, develop conflict management skills, and promote healthy research teams;

5. Inclusive recruitment, admissions, retention, and completion strategies including, but not limited to, studies of the impact of previously implemented and/or new innovations in policies or other interventions designed to broaden participation in STEM graduate education of students who are members of groups underrepresented in the STEM workforce; and

6. Credentialing and degree milestones including, but not limited to, studies assessing the impact of systemic innovations in graduate degree milestones, micro-credentials, stackable credentials, and competency-based approaches on graduate education outcomes such as student recruitment, retention, completion, skills development, and employment readiness.

Track 2 proposals may request a total budget (up to five years in duration) up to \$1,000,000.

Leadership teams (PI/Co-PIs) for both tracks are encouraged to include experts in education research, the learning sciences and/or evaluation, as appropriate, as well as in the principal science domain(s) as needed to design and implement a robust and appropriate research plan.

IGE welcomes proposals from early-career investigators and complements the Faculty Early Career Development (CAREER) Program's mission and focus. For information about the CAREER program, please refer to the Dear Colleague Letter: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf22099. However, researchers at all stages of their careers including mid-career faculty and investigators from non-academic organizations are welcome to apply.

IGE especially welcomes proposals that reflect collaborations between IGE proposals and existing [NSF Eddie Bernice Johnson Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science \(INCLUDES\) Initiative](#) projects, provided the collaboration will strengthen both projects. Researchers at minority serving institutions and emerging research institutions are strongly encouraged to submit proposals.

III. Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 16 to 20

IGE Track 1 Awards (6 to 10 anticipated in FY 2024) are expected to be up to three (3) years in duration with a total budget between \$300,000 and \$500,000.

IGE Track 2 Awards (6 to 12 anticipated in FY 2024) are expected to be up to five (5) years in duration with a total budget up to \$1,000,000.

The estimated number of awards and the anticipated funding amounts listed above for both Track 1 and Track 2 are for FY 2024. The number of awards and funding amounts in FY 2025 and FY 2026 are subject to the availability of funds.

Anticipated Funding Amount: The anticipated funding amount of \$14,000,000 is for FY 2024.

IV. Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.
- Non-profit, non-academic organizations: Independent museums, observatories, research laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- Tribal Nations: An American Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges as a federally recognized tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. §§ 5130-5131.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 2

An eligible organization may participate in two Innovations in Graduate Education proposals per annual competition. **Participation includes serving as a lead organization on a non-collaborative proposal or as a lead organization, non-lead organization, or subawardee on a collaborative proposal.** Organizations participating solely as evaluators on projects are excluded from this limitation. Proposals that exceed the organizational eligibility limit (beyond the first two submissions based on timestamp) will be returned without review regardless of the organization's role (lead, non-lead, subawardee) in the returned proposal.

Limit on Number of Proposals per PI or co-PI: 1

An individual may serve as Lead Principal Investigator (PI) or Co-PI on only one proposal submitted to the IGE program per annual competition. Proposals that exceed the PI/Co-PI eligibility limit (beyond the first submission based on timestamp) will be returned without review regardless of the individual's role (PI or Co-PI) in the returned proposal.

V. Proposal Preparation And Submission Instructions

A. Proposal Preparation Instructions

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Research.gov or Grants.gov.

- Full Proposals submitted via Research.gov: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal and Award*

Policies and Procedures Guide (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov. The Prepare New Proposal setup will prompt you for the program solicitation number.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov*. The complete text of the *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide. To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via Research.gov. PAPPG Chapter II.E.3 provides additional information on collaborative proposals.

See PAPPG Chapter II.D.2 for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the PAPPG instructions.

Title of Proposed Project: The title of the proposed project should begin with the term: "IGE: [add project Track 1 or Track 2]: [add project title]".

Cover Sheet: If international activities are proposed, whether or not they will be funded via the IGE award, the international cooperative activities box should be checked and the individual countries listed. For planning purposes, use October 1 as the award start date for proposals submitted to the FY 2024-FY 2026 competitions.

Project Summary: (1-page limit): Summarize, for Track 1 proposals: the graduate education innovation that will be piloted, the existing pilot that will be adopted or expanded, OR for Track 2 proposals: the systemic policies, procedures, or interventions and graduate student outcomes that will be examined) as part of the IGE project. Describe the disciplinary field(s) involved, the knowledge that will be generated to inform implementation and adaptability of transformative approaches to STEM graduate education, and how the project is responsive to a need and/or opportunity. Each NSF merit review criterion (Intellectual Merit and Broader Impacts) must be addressed in a separate statement (see the PAPPG for additional instructions). The summary should be written in a manner that will be informative to STEM professionals working in the same or related fields, and understandable to a scientifically literate lay reader.

Project Description (15-page limit): The Project Description cannot exceed 15 pages, including tables and illustrations. **The Project Description must contain only the sections described below with the suggested headings and in the order listed.**

For proposals submitted to TRACK 1 - Career Preparation Pilots:

Rationale and Goals

Describe the rationale for the proposed improvements and the overarching project goals of the IGE project with a focus on piloting and testing potentially transformative improvements in graduate education. The rationale for introducing the proposed innovation(s) should address the graduate education context or setting in which it will be introduced. All innovations should be grounded in the appropriate literature. Specify the approaches or models to be piloted and tested as well as the targeted graduate student population and the justification for their inclusion. Identify the potential of the IGE project to provide added value to the current degree programs at the institution(s) or in the discipline(s). Discuss the

potential for extending the approaches and activities nationally and how they could advance the modernization of graduate education across STEM disciplines.

Research Plan and Methods

IGE supports qualitative, quantitative, and mixed methods approaches to examine the impact of the proposed improvements in STEM graduate education to enhance career development and workforce development. This section should begin with a clear identification of the research questions and hypotheses and briefly describe the associated theoretical framework. Proposals should include how rigor will be ensured, including justification of the study design including why the proposed research strategies will be used to address the questions or hypotheses^{15,16}.

Proposals should address problem formulation, data collection, data evaluation and analysis as well as statistical methods and/or qualitative analytical methods that will be used to analyze the data to ensure valid, reliable, and trustworthy results. Studies should be described in sufficient detail so that other researchers can replicate the research¹⁷. If the project builds upon an early-stage or exploratory study, proposals should include a clear rationale for how this project is anticipated to generate new knowledge and discuss how research methods will differ to account for differences in scope, scale and/or target population. Proposals should describe the theory of change that informs the project's approach to innovation^{18,19,20}. Proposals should also state the theoretical framework that informs the research and, for qualitative studies, discuss how people involved in the research process are situated with respect to student participants (e.g., professional or potential power relationships, demographic or anticipated cultural similarities or dissimilarities). If previously validated instruments or newly developed ones will be used, proposals should describe the method of verifying validity and reliability in the proposed study.

For proposals submitted to TRACK 2 – Research on Systemic Interventions, Policies, Procedures and Outcomes:

Rationale

Describe the rationale for focus on the selected aspect of the graduate education system or systemic innovation. The research focus should be grounded in the appropriate literature addressing prior studies, where relevant. Specify the interventions, policies, or procedures to be studied, the targeted graduate student population(s) and the justification for their inclusion, as well as the time-period of the innovation of focus. Identify the potential of the IGE project to provide appreciable and meaningful added value to the current degree programs at the institution(s) or in the discipline(s) as well as anticipated limitations. Discuss the potential for extending the approaches and activities nationally and how they could advance the modernization of graduate education across STEM disciplines.

Research Plan and Methods

IGE supports qualitative, quantitative, and mixed methods approaches to examine the impact of systemic innovations in graduate education, interventions, and policies. This section should begin with a clear identification of the research questions or hypotheses and briefly describe the associated theoretical framework. Proposals should include justification of the study design including why the proposed research strategies will be used to address the questions or hypotheses^{15,16}.

Proposals should address problem formulation, data collection, data evaluation and analysis as well as statistical methods that will be used to analyze the data to ensure valid, reliable, and trustworthy results. Studies should be described in sufficient detail so that other researchers can replicate the research. [17] If the study proposed is a meta-analytical, this section should address how differences in methodological procedures within the studies included such as sampling, treatment parameters, and observation methods will be addressed. If a new systemic intervention is proposed, proposals should describe the theory of change that informs the project approach to innovation^{18,19,20}. For qualitative studies, authors should also state the theoretical framework that guided the research and discuss how people involved in the research process are situated with respect to student participants (e.g., professional or potential power relationships, demographic or anticipated cultural similarities or dissimilarities).

Examination of impact of interventions and policies across multiple institutions of similar and dissimilar types is encouraged. Research may involve the collection of original data on near-term impact of the implementation of new

policies and procedural interventions as well as secondary analyses using extant datasets or meta-analyses/meta-syntheses on previously implemented policy and procedural innovations. The duration of the intervention and the justification for the hypothesized correlation to the studies impact(s) should be clearly explained. Proposals are welcome from higher educational institutions, non-profit organizations, and consortia of institutions.

The following sections are required in the Project Description for both Track 1 and Track 2 proposals:

Organization and Management

This section should include a clear identification of members of the project team and a description of their assigned roles and responsibilities; a project management plan, including a timeline, that outlines major steps to be taken during the proposed project. If a collaborative proposal is proposed, describe the role of the non-lead institution(s) and the participating personnel roles, and the mechanisms for project communication. A collaborative proposal should be submitted only if the partner institution(s) has (have) a significant role and will substantially enhance the education model or components tested. If a graduate student is participating in the research, clearly discuss the roles of the graduate student and the research mentors who will guide their educational research. See *Graduate Student Support*, below.


Broader Impacts

The Project Description must contain, as a separate section within the narrative, a discussion of the broader impacts of the education model and activities. This section must be clearly labeled "Broader Impacts." For further information see the PAPPG.

Performance Assessment

Projects (Track 1 or Track 2) that include a novel intervention are strongly encouraged to include plans to assess project implementation and performance. Assessments should be both formative and summative, and the plan should describe how and when both formative and summative assessments would be shared with the project participants and institutional administration. Projects are not required to have an external evaluator. However, teams are encouraged to include evaluation expertise needed to ensure robust data collection and analysis methods appropriate to assess process and performance. Multiple iterations of data collection and analysis over the duration of the award are strongly encouraged, when appropriate. Performance assessment is not required for Track 2 Research projects that do not include implementation of novel interventions²¹.

Dissemination

The proposal should describe how successful approaches, practices, and models will be shared across the institution[s] or field[s] and nationally and include institutional plans to implement or scale innovations. Proposals should include plans for communicating project results to other stakeholders, both within the IGE community via participation in activities and resources of the IGE Innovation Acceleration Hub (IGeHub, <http://www.igehub.org/> ) and more broadly through publications, professional meetings, and electronic communications platforms.

Budget and Budget Justification:

Track 1: Provide an annual budget for up to three years total duration. The system will automatically generate a cumulative budget. The total proposed budget can range between \$300,000-\$500,000 and should be consistent with the costs to develop, implement, and evaluate the pilot.

Track 2: Provide an annual budget for between three years and five years total duration. The system will automatically generate a cumulative budget. The total proposed budget can be up to \$1,000,000 and should be consistent with the costs to implement the proposed interventions and/or conduct the proposed study.

Track 2 proposal budgets and budget justifications should align with the proposed scale of the intervention and/or research activities including: the number of participating programs, institutions, and/or STEM disciplines; participant or sample size; partnerships and collaborations; and duration of the study. Budgets should support participation across multiple institutions as appropriate in addition to reflecting the scale of the proposed research.

Budgets for both Track 1 and Track 2 should include funds for the PI and a Co-PI or evaluator to attend biennial IGE meetings in Washington, DC. For further information on allowable costs, see the PAPPG.

Graduate Student Support: IGE projects will only support stipends or cost of education, including tuition and fees for graduate students engaged in an educational research component that aligns with their thesis research (e.g., College of Education, Discipline-based Educational Research units, and similar). See *Organization and Management*, above.

Supplementary Documentation:

Letters of Collaboration: Letters of collaboration using the standard NSF format (see PAPPG for guidance) may be provided from partner organizations, including international organizations, that play a significant collaborative role in the project. Track 2 projects must include one Letter of Collaboration from an appropriate senior administrator from each of the participating institution(s). See PAPPG for guidance.

No other items or appendices are to be included. ***Full proposals containing items other than those required above or by the PAPPG will be returned without review.***

REFERENCES

- ¹ *Graduate Education for the 21st Century*, National Academies, 2018
- ² *STEM Education for the Future: A Visioning Report*, Subcommittee of the Advisory Committee of the Education and Human Resources Directorate, 2020
- ³ *Grand Challenges for Engineering*, National Academies for Engineering, 2017
- ⁴ *The Path Forward: The Future of Graduate Education*, Commission on the Future of Graduate Education in the United States, 2010
- ⁵ *Advancing Graduate Education in the Chemical Sciences*, American Chemical Society, 2012
- ⁶ *Biomedical Research Workforce Working Group Report*, National Institutes of Health, 2012
- ⁷ *Understanding PhD Career Pathways for Program Improvement*, Council of Graduate Schools, 2014
- ⁸ *The STEM Labor Force Today: Scientists, Engineers, and the Skilled Technical Workforce*, National Science Board, 2021
- ⁹ *Professional Development: Shaping Effective Programs for STEM Graduate Students*, Council of Graduate Schools, 2017
- ¹⁰ *Holistic Review in Graduate Admissions*, Council of Graduate Schools, 2016
- ¹¹ *Supporting Graduate Student Mental Health and Well-being*, Council of Graduate Schools and the Jed Foundation, 2021
- ¹² *NSF RAPID: Graduate Student Experiences of Support and Stress During the COVID-19 Pandemic*, University of Montana, 2020
- ¹³ *CU Committee Report: Generative Artificial Intelligence for Education and Pedagogy*, Cornell University, 2023
- ¹⁴ Hofstra, B., Kulkarni, VV., Galvez, SM-N., He, B., Jurafsky, D., & McFarland, DA. (2020, April). The Diversity – Innovation Paradox in Science. *Proceedings of the National Academy of Sciences*, 117(17), 9284-9291.
- ¹⁵ Tracy, SJ. (2010). "Qualitative Quality: Eight "Big-Tent" Criteria for Excellent Qualitative Research," *Qualitative Inquiry*, 16:10, pp.837-851.

¹⁶ Creswell & Creswell. *Research Design Qualitative, Quantitative, and Mixed Methods Approaches*, 2017

¹⁷ *Common Guidelines for Education Research and Development*. A Report from the Institute of Education Sciences US Department of Education, and the National Science Foundation, 2013

¹⁸ Reinholz, D.L. & Andrews, TC. (2020). "Change theory and theory of change: what's the difference anyway?" *International Journal of STEM Education*, 7:2

¹⁹ Reinholz, D.L., White, I. & Andrews, T. (2021). "Change Theory in STEM higher education: a systematic review," *International Journal of STEM Education*, 8:37

²⁰ Connolly, MR., & Seymour, E., *Why theories of change matter* (WCER Working Paper No. 2015-2), 2015

²¹ *The 2010 User-Friendly Handbook for Project Evaluation*. Directorate for Education and Human Resources and the Division of Research and Learning in Formal and Informal Settings National Science Foundation, 2010.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. submitter's local time):

April 22, 2024

March 25, 2025

March 25, Annually Thereafter

Due by 5pm submitter's local time

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

To prepare and submit a proposal via Research.gov, see detailed technical instructions available at:

[https://www.research.gov/research-portal/appmanager/base/desktop?](https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubn)

[_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubn](https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubn)

For Research.gov user support, call the Research.gov Help Desk at 1-800-381-1532 or e-mail rgov@nsf.gov. The

Research.gov Help Desk answers general technical questions related to the use of the Research.gov system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: <https://www.grants.gov/web/grants/applicants.html>. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to Research.gov for further processing.

The NSF [Grants.gov Proposal Processing in Research.gov informational page](#) provides submission guidance to applicants and links to helpful resources including the NSF [Grants.gov Application Guide](#), [Grants.gov Proposal Processing in Research.gov how-to guide](#), and [Grants.gov Submitted Proposals Frequently Asked Questions](#). Grants.gov proposals must pass all NSF pre-check and post-check validations in order to be accepted by Research.gov at NSF.

When submitting via Grants.gov, NSF strongly recommends applicants initiate proposal submission at least five business days in advance of a deadline to allow adequate time to address NSF compliance errors and resubmissions by 5:00 p.m. submitting organization's local time on the deadline. Please note that some errors cannot be corrected in Grants.gov. Once a proposal passes pre-checks but fails any post-check, an applicant can only correct and submit the in-progress proposal in Research.gov.

Proposers that submitted via Research.gov may use Research.gov to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

VI. NSF Proposal Processing And Review Procedures

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in PAPPG Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: https://www.nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in [Leading the World in Discovery and Innovation, STEM Talent Development and the Delivery of Benefits from Research - NSF Strategic Plan for Fiscal Years \(FY\) 2022 - 2026](#). These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (PAPPG Chapter II.D.2.d(i). contains additional information for use by proposers in development of the Project Description section of the proposal). Reviewers are strongly encouraged to review the criteria, including PAPPG Chapter II.D.2.d(i), prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
 - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. 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?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and other underrepresented groups in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will generally be completed and submitted by each reviewer and/or panel. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new recipients may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements or the Division of Acquisition and Cooperative Support for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

VII. Award Administration Information

A. Notification of the Award

Notification of the award is made to *the submitting organization* by an NSF Grants and Agreements Officer. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award notice, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award notice; (4) the applicable award conditions, such as Grant General Conditions (GC-1)*; or Research Terms and Conditions* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

Administrative and National Policy Requirements

Build America, Buy America

As expressed in Executive Order 14005, [Ensuring the Future is Made in All of America by All of America's Workers](#) (86 FR 7475), it is the policy of the executive branch to use terms and conditions of Federal financial assistance awards to maximize, consistent with law, the use of goods, products, and materials produced in, and services offered in, the United States.

Consistent with the requirements of the Build America, Buy America Act (Pub. L. 117-58, Division G, Title IX, Subtitle A, November 15, 2021), no funding made available through this funding opportunity may be obligated for an award unless

all iron, steel, manufactured products, and construction materials used in the project are produced in the United States. For additional information, visit NSF's [Build America, Buy America](#) webpage.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer no later than 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). No later than 120 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

VIII. Agency Contacts

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Daniel Denecke, telephone: (703) 292-8072, email: ddenecke@nsf.gov
- Karen McNeal, telephone: (703) 292-2138, email: kmcneal@nsf.gov
- Elizabeth A. Webber, telephone: (703) 292-4316, email: ewebber@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-381-1532
- Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. Other Information

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF [Grants Conferences](#). Subscribers are informed through e-mail or the user's Web

browser each time new publications are issued that match their identified interests. "NSF Update" also is available on [NSF's website](#).

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this mechanism. Further information on Grants.gov may be obtained at <https://www.grants.gov>.

About The National Science Foundation

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.F.7 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <https://www.nsf.gov>

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
 - **For General Information** (703) 292-5111
(NSF Information Center):
 - **TDD (for the hearing-impaired):** (703) 292-5090
 - **To Order Publications or Forms:**
- Send an e-mail to: nsfpubs@nsf.gov
- or telephone: (703) 292-8134

- **To Locate NSF Employees:** (703) 292-5111

Privacy Act And Public Burden Statements

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by proposers will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding proposers or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See [System of Record Notices](#), [NSF-50](#), "Principal Investigator/Proposal File and Associated Records," and [NSF-51](#), "Reviewer/Proposal File and Associated Records." Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Policy Office, Division of Institution and Award Support
Office of Budget, Finance, and Award Management
National Science Foundation
Alexandria, VA 22314

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National Science Foundation, 2415 Eisenhower Ave Alexandria, VA 22314
Tel: [\(703\) 292-5111](tel:7032925111),

WI Decl. of Simcox, Ex. C
5.16.2025

From: [NSF Grants](#)
To: [DOROTA BRZEZINSKA](#)
Cc: [RSP - NSF](#)
Subject: Notice from National Science Foundation
Date: Friday, April 25, 2025 10:50:39 AM

U.S. National Science Foundation Division of Grants and Agreements
2415 Eisenhower Avenue
Alexandria, Virginia 22314
(703) 292-8210

04/25/2025

Dorota Grejner-Brzezinska
Vice Chancellor for Research
University of Wisconsin-Madison
dorota.brzezinska@wisc.edu

Dear Dorota Grejner-Brzezinska:

The U.S. National Science Foundation (NSF) has undertaken a review of its award portfolio. Each award was carefully and individually reviewed, and the agency has determined that termination of certain awards is necessary because they are not in alignment with current [NSF priorities](#).

Effective immediately, the following are terminated:

NSF Award Id
2332102
2139125
2100017
2219604
2343113
2118482
2201545
2401278
2415767
2429717
2416516

NSF is issuing this termination to protect the interests of the government pursuant to NSF Grant General Conditions (GC-1) term and condition entitled 'Termination and Enforcement,' on the basis that they no longer effectuate the program goals or agency priorities. This is the final agency decision and not subject to appeal.

Costs incurred as a result of this termination may be reimbursed, provided such costs would otherwise be allowable under the terms of the award and the governing cost principles. In accordance with your award terms and conditions, you have 30 days from the termination date to furnish a summary of progress under the award and an itemized accounting of allowable costs incurred prior to the termination date.

Sincerely,

Jamie H. French, Division Director
Office of Budget Finance and Award Management (BFA)
Division of Grants and Agreements (DGA)