NSF 24-506: International Research Experiences for Students (IRES)

Program Solicitation

Document Information

Document History
- **Posted:** November 7, 2023
- **Replaces:** NSF 20-598

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National Science Foundation
Office of International Science and Engineering

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

February 05, 2024

October 28, 2024

Fourth Monday in October, Annually Thereafter

Table Of Contents

Important Information And Revision Notes

- Independent IRES tracks have been eliminated. Advanced Studies Institutes are welcome in the main IRES program.
- IRES invites a wider variety of creative approaches to engage students in international research experiences.
- Maximum budget and duration increased to $150,000 per year for projects up to 5 years duration, with appropriate justification.
- NSF's Education & Training Application (ETAP) is described and encouraged as a means of managing student applications and collecting student demographic information.

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:

    International Research Experiences for Students (IRES)

Synopsis of Program:

    The International Research Experiences for Students (IRES) program supports international research and research-related activities for U.S. science and engineering students. The IRES program contributes to development of a diverse, globally engaged workforce with world-class skills. IRES focuses on active research participation by undergraduate and/or graduate students in high quality international research, education and professional development experiences in NSF-funded research areas.

    The overarching, long-term goals of the IRES program are to enhance U.S. leadership in science and engineering research and education and to strengthen economic competitiveness through training the next generation of science research leaders. IRES focuses on the development of a world-class U.S. STEM workforce through international research experiences for cohorts of U.S. students.

Student participants supported by IRES funds must be citizens, nationals, or permanent residents of the United States.

Students do not apply directly to NSF to participate in IRES activities. Students apply to NSF-funded investigators who receive IRES awards. To identify appropriate IRES projects, students should consult the directory of active [IRES awards](#).

All PIs, co-PIs and Senior Personnel on IRES proposals must be from U.S. based organizations. Personnel from international partners should be listed as "non-NSF funded collaborators." Guidance on information to provide for "non-NSF funded collaborators" is found in Section V.A.

IRES projects engage a group of undergraduate and/or graduate students in active high-quality collaborative research, in principle at an international site with mentorship from international researchers. IRES projects must be organized around a coherent overarching intellectual theme that may involve a single discipline or multiple disciplines funded by NSF.

For all IRES proposals, PIs are strongly encouraged to outline a variety of virtual, hybrid or other alternative approaches to strengthen and maintain international collaboration in addition to travel. It is expected that these approaches will extend collaboration beyond the actual international trip and strengthen IRES proposals overall.

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.

- Kristin Kuyuk, Program Director, telephone: ires@nsf.gov, email: ires@nsf.gov

- Allyson Kennedy, telephone: ires@nsf.gov, email: ires@nsf.gov

- Naoru Koizumi, telephone: ires@nsf.gov, email: ires@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- STEM Education
- 47.079 --- Office of International Science and Engineering
- 47.083 --- Office of Integrative Activities (OIA)
- 47.084 --- NSF Technology, Innovation and Partnerships

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 20 to 25

Approximately 20-25 awards will be made in FY 2024, pending quality of proposals and availability of funds.

Anticipated Funding Amount: $12,000,000

Approximately $12,000,000 in FY 2024, pending availability of funds. Up to $150,000 per year, for a maximum of 5 years, including indirect costs. A typical IRES project is for three years. However, longer duration projects up to 5 years will also be considered.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- 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.
- 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.

Who May Serve as PI:

All PIs, Co-PIs and Senior Personnel on IRES proposals must be from U.S. based organizations. Foreign collaborators cannot be listed as PIs, Co-PIs or Senior Personnel.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An individual may serve as Principal Investigator (PI) or co-PI on only one proposal submitted to the IRES program per annual competition.

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:**

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

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

    February 05, 2024

    October 28, 2024

    Fourth Monday in October, Annually Thereafter

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria. Additional merit review criteria apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions:

Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements:

Standard NSF reporting requirements apply.

I. Introduction

Science and engineering research increasingly requires international teams to solve the most complex challenges. Accordingly, leading scientific and engineering facilities, resources, and expertise are distributed around the globe. To remain at the forefront of science, technology, engineering, and mathematics (STEM), the United States must train and nurture a cadre of globally engaged STEM students who will thrive in the rapidly changing international landscape. To advance this objective and enhance U.S. leadership in science research, education, and innovation, the International Research Experiences for Students (IRES) program provides mechanisms to support U.S. students to conduct cutting-edge scientific research and engage in high-quality research-related professional development activities abroad, in collaboration with foreign investigators.

IRES projects contribute to the development of a globally competitive and diverse scientific workforce to increase U.S. economic competitiveness. IRES experiences expose U.S. students to the international research community at a critical stage in their careers and serve to establish international networks to bolster their professional development. IRES supports activities designed in partnerships with researchers outside the U.S. and conducted at international sites, leveraging U.S. and international resources for mutual benefit.

The IRES program accepts proposals in any disciplinary field that NSF supports. Topics in multi-disciplinary and convergent areas of science research, training and professional development are encouraged. The IRES program strengthens the pipeline from undergraduate to graduate levels and beyond. In addition, K-12 teachers may take part in IRES Sites projects through the NSF Research Experience for Teachers (RET) program. IRES projects are organized and proposed by U.S. organizations and U.S.-based Principal Investigators who choose the topics and foreign site placements, arrange appropriate foreign mentorship and necessary resources, and recruit and prepare U.S. students to participate in the experiences.

NSF encourages participation from the full spectrum of diverse talent that society has to offer. This includes a focus on recruiting underrepresented minorities, women, first-generation/low-income students, students from institutions with limited exposure to research opportunities, persons with disabilities, and veterans is strongly encouraged. Proposals from

non-R1 institutions and minority serving institutions are also strongly encouraged. There is a growing body of literature on ways to recruit a diverse set of students and design effective programs for international STEM engagement at the undergraduate and graduate level. PIs are encouraged to explore relevant literature and utilize those resources in their proposals.

II. Program Description

IRES projects may involve collaboration within an already-established partnership between a U.S.-based research group and a foreign research group (e.g., an existing lab-to-lab arrangement, U.S. and foreign professional societies, etc.). Alternatively, IRES projects may propose to initiate new international collaborations, or create new international research teams/networks.

Although two-way exchanges of U.S. and foreign students are strongly encouraged, the IRES program provides support only for the U.S. team. The IRES program does not provide salary support for the foreign research mentors, although it supports research and related logistical and other expenses for the U.S. team while in an international location. IRES PIs are welcome to organize exchange visits by foreign students and collaborators, but those expenses cannot be part of the IRES budget.

PIs are responsible for arranging required visas and other travel documents for foreign travel and obtaining research permits and import/export documents, where necessary.

In all cases, the IRES students/participants will be recruited and trained by the U.S. PI(s). Students/participants will travel to the foreign site to conduct scientific research, participate in training and professional development activities under direct supervision of the foreign research mentor(s). It is expected that a different group of students will participate in the IRES program each year. Active collaboration with the international partner in implementing the project is essential. PIs should consider ways to extend collaboration beyond the international trip, to include on-going engagement of students/participants in planning and synthesis of research and educational activities before and after travel to the foreign site.

Three years is the typical duration of IRES awards; however, a duration of up to 5 years may be supported in some cases if well-justified.

IRES proposals must have a unifying scientific research theme that enables a cohort experience for participating undergraduate and/or graduate students to collaborate with international partners. The cohort concept requires that within an IRES project, each participating student must have an individual research project for which they are responsible. Individual student projects must be coordinated to address the unifying research theme. To provide the best cohort experience and to simplify logistical burdens, it is suggested that all students supported by a given IRES project travel to the foreign location(s) at the same time. However, well-justified alternative approaches will be considered. If students are to be hosted at more than one location, it is expected that their projects will address a common scientific theme across locations. The proposal should include a plan for all participants to be reunited at one foreign location at least once during the overseas trip.

IRES proposals should support separate cohorts of students each year and give as many students as feasible, within budgetary constraints, the opportunity for a meaningful scientific research experience abroad. Proposals that include fewer than five U.S. students per year, or whose annual duration of research conducted abroad is less than four weeks, should be justified by exceptional conditions or circumstances. Longer duration and/or more students are generally preferable to shorter duration proposals with fewer students.

OISE realizes that the IRES program's goals can be achieved in many different ways, Hence, in addition to the IRES Sites model of faculty-led student cohorts performing scientific research under the mentorship of a foreign researcher, the IRES program welcomes proposals with creative, innovative, and ambitious ideas and concepts to address the IRES goals and objectives. These may include but are not limited to fundamentally new ways to prepare and train a globally-engaged STEM research workforce; relevant workshops; advanced studies institutes for graduate students and/or science teachers; original concepts and mechanisms to maximize impact of the international collaborations; ideas, platforms, or

technologies leading to resilient enduring collaborative teams or networks; virtual/hybrid research-relevant events; extended pre-and post-trip activities using virtual collaboration platforms; creative ways to incorporate graduate students into the program even if they cannot travel for the entire duration of the project; or other well-designed activities developed by the PI team. PIs interested in submitting such proposals should contact the cognizant IRES Program Directors with a 2-page white paper to discuss appropriateness of the proposed activities and feasibility of the required budget before developing the full proposal.

Substantial research mentorship must be provided by foreign mentors. The U.S. PI is responsible for recruiting and preparing U.S. student participants, ensuring the quality of the research experience, and the appropriateness of the foreign research mentorship. It may be necessary for U.S. PIs to spend a short period of time with the U.S. students to help with the transition to the foreign site and mentors. U.S. PIs are not required to remain on-site with the U.S. students throughout the period abroad but are encouraged to use remote means to co-mentor.

In all cases, proposals must clearly describe the plan for recruiting a full spectrum of student talent in STEM, including how the planned activities will broaden participation in STEM. Recruitment of the U.S. student participants may occur locally, or may involve wider regional or national recruitment plans, as appropriate for the specific project. The plan should also address the process for selecting and preparing the students who will participate. The IRES program can only support students who are U.S. citizens, nationals, or permanent residents. The intent of the program is to broaden the international experience of U.S. students. Preparation of the students to enable maximum benefit during the period spent abroad is particularly important, and should be both scientific and location-specific, including practical and socio-cultural information. The IRES program budget does not support coursework or development of instructional /teaching materials.

Proposals should describe the scientific research focus of the proposed activity; the intellectual collaboration with and mutual benefit for the foreign team; the plan for enhancement of student training and professional development; details of the mentoring plan; recruitment and broadening participation plans; selection process; the pre-departure preparation of students and follow up activities; arrangements for housing, stipends, health insurance, and other logistics; plans for leveraging U.S. and foreign resources to strengthen the project; the plan to assess the impact of the IRES project; and strategies for disseminating project results. PIs are encouraged to describe how they will use virtual, hybrid or alternative approaches to augment student preparation and follow-up and to facilitate continued international collaboration in the event travel plans are interrupted.

Research Experiences for Teachers (RET)

NSF encourages research experiences for K-12 teachers of science, technology, engineering, and mathematics and the coordination of these experiences with IRES projects. Teachers may be included in IRES projects as part of the cohort. Proposers who wish to include an RET in an IRES proposal should contact the cognizant IRES program officer for guidance.

III. Award Information

Estimated program budget, number of awards and average award size/duration are subject to the quality of proposals and availability of funds. It is expected that NSF will support approximately 20-25 awards in FY 2024.

IV. Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- 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.
- 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.

Who May Serve as PI:

All PIs, Co-PIs and Senior Personnel on IRES proposals must be from U.S. based organizations. Foreign collaborators cannot be listed as PIs, Co-PIs or Senior Personnel.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An individual may serve as Principal Investigator (PI) or co-PI on only one proposal submitted to the IRES program per annual competition.

Additional Eligibility Info:

Subawards to foreign institutions or international branch campuses of U.S. institutions of higher education are not allowed.

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.

The information below supplements the standard PAPPG and NSF Grants.gov Application Guide proposal preparation guidelines. Please use this information while preparing a proposal for the IRES program:

- **Proposal Title**. The proposal title should begin with "IRES:" followed by a descriptive title of the proposed activities. For collaborative proposals arranged as separate submissions from multiple organizations, the project title must begin with the words "Collaborative Research:" followed by the "IRES:" prefix.

- **Cover Sheet**. Check the box for "International Cooperative Activities Country Name" that appears under the Other Information when the "remainder of cover sheet" is clicked, then select the countries involved.

- **Project Summary (one page maximum)**. In the overview, the PI must clearly present the following information: (I) foreign countries involved; (ii) a number of undergraduate and/or graduate student participants per year; (iii) total duration of the project; (iv) an estimated number of days or weeks per year that the students will participate in IRES activities at the international location. Include the names and institutional affiliations of key U.S. and foreign collaborators and briefly note their roles in the proposed activities. Foreign collaborators should be identified as "non-NSF funded collaborators". Summarize the research topic(s) and highlight the collaborative aspects of the activity.

- **Project Description and Results from Prior NSF Support. Per the guidance in the PAPPG, the Project Description must include a separate section labeled "Broader Impacts". In addition, include the following IRES elements:**
    - **Overview.** Present the overall research goals and expected achievements. Provide a brief description of the overarching theme and research focus of the proposed activity, including specific science or engineering challenges to be addressed, rationale for conducting the project internationally, and examples of research projects that individual students will conduct during their time abroad. Also, present virtual, hybrid or other alternative approaches to international collaboration in the event travel is not undertaken, and/or in addition to travel.

    - **Nature of Activities.** Proposals should address the intellectual/professional collaboration with the foreign team and mentors. Provide detailed descriptions of the envisioned research and sample research projects students will pursue.

    - **Student Recruitment and Selection.** The overall quality of the student recruitment and selection processes and criteria will be an important element in the evaluation of the proposal. The recruitment plan should be described with as much specificity as possible including a detailed description of the efforts that will be made to broadening participation to include the full spectrum of students in science and engineering. Mention how the applications will be received. Please note that NSF offers the NSF Education & Training Application (ETAP) as one approach, as described in Section VII.C. (Reporting Requirements).

      NSF does not tolerate sexual harassment, or any other form of harassment, where NSF-funded activities take place. Proposers are required to have a policy or code of conduct that addresses sexual harassment, other forms of harassment, and sexual assault. Proposers must provide an orientation for all participants in the IRES site (REU students, faculty, students, research mentors, etc.) to cover expectations of behavior to ensure a safe and respectful environment for all participants, and to review the organization's policy or code of conduct addressing sexual harassment, other forms of harassment, and sexual assault, including reporting and complaint procedures. For additional information, see the NSF policies at https://new.nsf.gov/stopping-harassment.

      When submitting the IRES proposal, the AOR must complete a certification that the organization has a plan in place to ensure a safe and inclusive working environment as described in PAPPG Chapter II.E.9.

    - **The Research Environment, Collaborators and Mentors.** Explain why international collaboration is required for the envisioned research project. Describe the unique expertise, facilities, data, and/or other resources that will be available to IRES students. Describe why the particular collaborator(s) and foreign site(s) are desirable for the proposed project from a scientific and/or professional development standpoint, as well as why the particular site(s) is/are suitable for hosting and mentoring U.S. students. Discuss plans for leveraging U.S. or foreign resources to strengthen the project, such as, taking advantage

of existing facilities, research infrastructure, academic centers, field sites, language instruction, international programming, or cultural activities.

- **Student Preparation.** The proposal should describe plans for pre-departure preparation of U.S. student participants, as well as arrangements for housing, health insurance and other logistics. PIs are encouraged to describe how they will use virtual, hybrid or alternative approaches to augment student preparation and to facilitate continued international collaboration in addition to the foreign travel, or in the event travel plans are interrupted.

- **Professional Development.** Describe plans for enhancing the professional development of student participants, including post-trip follow-up plans for interactions such as student-faculty, student-mentor, and student-student cooperation.

- **Project Evaluation, Dissemination and Reporting.** Discuss plans to a) measure qualitatively and quantitatively the IRES project in terms of project goals and achievements as well as student research and professional development experiences, b) assess impacts over time, c) disseminate results of the research within the appropriate scientific disciplinary community, and d) publicize the IRES project student experiences in ways that will share the benefits across a wider body of U.S. STEM students and encourage other students to engage internationally.

- **Supplementary Documentation:**
  - Biographical sketches for principal foreign collaborators are required and must be clearly identified as "non-NSF funded collaborators". Biosketches must be in English and must adhere to the format given in the PAPPG Chapter II.D.2.h.
  - Letters of Collaboration from foreign researchers/collaborators who will serve as mentor(s) for the IRES students or otherwise participate in the IRES program are required. These letters must clearly and concisely state 1) what infrastructure, resources, expertise etc. will be available to IRES participants at the international site, 2) what particular roles the foreign mentors or collaborators will play in the IRES project, and 3) how foreign collaborators and/or their organizations will benefit from participation in the IRES project. This solicitation requires these descriptive letters of collaboration in lieu of the standard PAPPG language.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

IRES budgets support the U.S. portion of international collaborations.

- Maximum total budget is $150,000 per year. Typical IRES proposals are up to 3 years, but in special cases up to 5-year duration will be considered with appropriate justification.

- Participating students must be given a stipend in the range of $600 - $700 per week for the duration of the IRES project. The same hourly rate of stipend should be used to compensate students involved in hybrid models or part-time research.

- Graduate students can be part of the IRES cohort and receive a stipend for their contribution in the IRES project, but full-time graduate research assistant support or their tuition fees are not allowed.

- Foreign collaborators cannot be listed as PIs, co-PIs or Senior Personnel.

- Subawards to foreign institutions or international branch campuses of U. S. institutions of higher education are not allowed.

- IRES budgets are expected to mostly support students and their research and training-related expenses.

- Up to one month of PI salary per project year is allowed; if there are co-PIs, the one month should be distributed between them.
- IRES funds cannot be used to pay foreign mentors and students at the host location. However, if a project involves workshops or advanced studies institutes, reasonable honoraria and travel expenses may be requested.
- The budget can include funds for research and related logistical/other expenses for the U.S. team while in an international location.

C. Due Dates

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

    February 05, 2024

    October 28, 2024

    Fourth Monday in October, Annually Thereafter

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?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. 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.

Additional Solicitation Specific Review Criteria

In addition to the general NSF review criteria described above, the following criteria will be used in evaluating proposals submitted in response to this solicitation:

1. **Student Recruitment:** Appropriateness of the student recruitment and selection plans, including those for involving students from the full spectrum of diverse talent in STEM and from IHEs with limited research opportunities.

2. **Collaborators and Mentors:** The appropriateness of the selection of researchers/mentors and host institution or location arrangements, including the opportunity for US students to benefit from the expertise, facilities, etc., of the foreign location.

3. **Student Preparation:** Quality of plans for student preparation, including both academic/research and cultural/practical preparation specific to the topic of the research and the site of the international placement. The suitability of the research mentoring plan and project for the academic level of the intended student participants, the length of the program, the facilities available, etc.

4. **Professional Development:** Plans to enhance the project's effectiveness and impact on student professional development, as well as plans for post-trip follow up after the overseas experience is completed.

5. **Evaluation and Dissemination:** Quality of the proposed evaluation and dissemination plans.

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.

Special Award Conditions:

Recipients will be required to participate in program-level evaluation by NSF. NSF, an NSF contractor, or a grantee on behalf of NSF, may periodically conduct program evaluations or special projects that necessitate access to project level staff and data. This activity may occur at any time during the grant period and could occur after the grant has ended. Project-level participation includes responding to inquiries, interviews, and other methods of common data collection and/or aggregation across individual grants.

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:

- Kristin Kuyuk, Program Director, telephone: ires@nsf.gov, email: ires@nsf.gov

- Allyson Kennedy, telephone: ires@nsf.gov, email: ires@nsf.gov

- Naoru Koizumi, telephone: ires@nsf.gov, email: ires@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 (FASED) 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:

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