

# Research Security Training for the United States (U.S.) Research Community

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## PROGRAM SOLICITATION NSF 22-576

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National Science Foundation  
Office of Integrative Activities



Department of Defense



Department of Energy



National Institutes of Health

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

May 23, 2022

## IMPORTANT INFORMATION AND REVISION NOTES

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Innovating and migrating proposal preparation and submission capabilities from FastLane to Research.gov is part of the ongoing NSF information technology modernization efforts, as described in [Important Notice No. 147](#). In support of these efforts, research proposals submitted in response to this program solicitation must be prepared and submitted via Research.gov or via Grants.gov, and may not be prepared or submitted via FastLane.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) ([NSF 22-1](#)), which is effective for proposals submitted, or due, on or after October 4, 2021.

## SUMMARY OF PROGRAM REQUIREMENTS

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### General Information

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**Program Title:**

Research Security Training for the United States (U.S.) Research Community

**Synopsis of Program:**

With the goal of strengthening research security in the U.S., NSF is working in partnership with three other federal research funding agencies to find a balanced approach to research security. This effort includes the development and implementation of training — to recipients of federal research funding — in best practices to optimize research security. This training is an essential step toward mitigating foreign government risks and threats to U.S. government-funded research and may be used to fulfill the research security program requirement in [NSPM-33](#).

**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.*

- Rebecca L. Keiser, telephone: (703) 292-8000, email: [rkeiser@nsf.gov](mailto:rkeiser@nsf.gov)

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

- 47.083 --- Office of Integrative Activities (OIA)

## Award Information

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**Anticipated Type of Award:** Cooperative Agreement

**Estimated Number of Awards:** 1 to 3

**Anticipated Funding Amount:** \$1,500,000

\$1,500,000 for this competition, pending the availability of funds.

Subject to availability of funds and quality of proposals, each project is anticipated to total up to \$500,000, inclusive of both direct and indirect costs.

## Eligibility Information

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### 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 labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.

### Who May Serve as PI:

There are no restrictions or limits.

### Limit on Number of Proposals per Organization:

Each training module proposal must address ONE of the four topical areas identified in Section II Program Description. A proposer, however, is authorized to submit separate proposals for more than one topical area. There are no limits on the number of proposals per organization.

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

There are no restrictions or limits.

## Proposal Preparation and Submission Instructions

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### 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](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](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):

May 23, 2022

## Proposal Review Information Criteria

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### 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

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### Award Conditions:

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

### Reporting Requirements:

Standard NSF reporting requirements apply.

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## I. INTRODUCTION

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The National Science Foundation (NSF), in partnership with the National Institutes of Health (NIH), the Department of Energy (DOE), and the Department of Defense (DOD), seek proposals for the development of on-line training modules designed to promote the understanding of research security for researchers and other key personnel whose work is supported by federally funded research awards at awardee organizations.

Scientific research is critical to America's ability to sustain its position as an innovation leader, to sustain economic growth, as well as to support national security in our science and technology (S&T) enterprise. Strengthening the security and integrity of our nation's S&T research enterprise is an effort that relies on the awareness and cooperation of all stakeholders.

The purpose of this modular training is to enhance awareness and to help provide recipients of federal research funding with on-line training on the existing and emerging risks and threats to the global research ecosystem — and the knowledge and resources necessary to protect against such risks and threats. This training is intended to be an important component to securing federally funded research, while maintaining the current, open, and transparent global research ecosystem.

## II. PROGRAM DESCRIPTION

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Acquiring and managing federal research grants and cooperative agreements comes with great responsibility. The protection of academic research relies on individuals to uphold core principles and values such as openness, transparency, reciprocity, collaboration, and integrity.

In an effort to strengthen research security in the U.S., the National Security Presidential Memorandum – 33 (NSPM-33) was signed on January 14, 2021.

NSPM-33 directs federal funding agencies to strengthen protections of U.S. government-supported research and development against foreign government interference and exploitation. This training is an essential step toward mitigating foreign government risks and threats to U.S. government-funded research and may be used to fulfill the research security program requirement in NSPM-33.

To this end, NSF, in coordination with other federal research funding agencies, seeks a balanced approach to research security that includes training of recipients in best practices in research security for federally funded research.

The primary audience for such training is federal grant and cooperative agreement recipients that conduct research. Specifically, the key audience is comprised of Principal Investigators (PIs) and co-PIs, other senior personnel, and graduate and postdoctoral scholars conducting S&T research (primarily in institutions of higher education and non-profit research organizations). Merit review panelists and organizational sponsored projects office personnel would also benefit from specific topical areas.

Additional external audiences who may also benefit from this training include members of professional scientific and engineering societies, and higher education associations.

### **Topical Areas for Training Modules**

This solicitation will support the development of training modules (curriculum and technical solutions) to be made publicly available and which are designed to increase the security and integrity of U.S. federally funded research by providing a wider knowledge base on the application of research security measures in the proposal and award process. The goal of the training is to better protect U.S. research interests from both domestic and foreign risks and threats. Training modules proposed must be:

- Internet-based and widely accessible to the end user; and
- Scalable and flexible, designed to accommodate new modules that can be added as new training needs are identified among the partner federal agencies.

Each training module proposal must address ONE of the following four topical areas. A proposer, however, is authorized to submit separate proposals for more than one topical area.

#### **1. Why is research security an important issue?**

Proposers will develop training that discusses the issues of research security and why research security for federally funded research is important for the U.S. government and national security.

In summary, the U.S. federal S&T research agencies seek to maintain a vibrant science and engineering community for the benefit of the nation. Participation in this community relies on individuals to uphold core principles and values such as openness, transparency, reciprocity, collaboration, and integrity. However, open scientific exchange and research face a challenge from some foreign governments seeking to misappropriate scientific research and data and recruit U.S. researchers through unethical means. One popular mechanism used to capture U.S. research and researchers is use of foreign talent recruitment programs. Some of these programs deliberately disregard core principles and incentivize participants to acquire U.S. funded scientific research. These programs target scientists, engineers, and educators of all nationalities working or educated in the U.S.

#### **2. What is a disclosure policy and how will it be used?**

Proposers will develop training that explains federal funding agency disclosure policies — why this information is important and how it will be used. The training module should emphasize and clarify the types of information that must be disclosed in the federal research proposal. The training should also discuss how grants administrators can identify anomalies in proposals during the submission process that might indicate transgressions such as:

- Conflicts of interest and conflicts of commitment;
- Undisclosed research duplication and researcher commitments to research entities outside their U.S. employer;
- Compromises to the merit review system; and
- Unauthorized use of pre-publication data and information.

Transparency and disclosure are needed to properly assess risk and are essential for federal agencies to make sound funding decisions. Undisclosed research duplication and researcher commitments to research entities outside their U.S. employer, are a threat to securing U.S. federal research.

Failure to properly disclose membership in mechanisms such as foreign talent recruitment programs can have criminal or civil ramifications. In addition, federally funded recipients could be affected by financial constraints driven by the pandemic, which could undermine their ability to identify and manage conflicts of interests, commitment, and affiliation created by researchers' involvement with such programs.

In summary, the training must communicate the importance of inclusion of full disclosure information in submitted proposals for proper assessment, to determine the individual's qualifications and capacity to perform the proposed project as well as to prevent overlap with other obligations, or duplication of research.

#### **3. What actions can federally funded research recipients take to manage and mitigate risk?**

Federal research agencies are making significant efforts to alert the research community to existing and emerging risks to the global research ecosystem. Through enhanced outreach efforts, federal research agencies have come together at outreach events with researchers and administrators to discuss issues and share information. This effort has led to clarifications of proposal preparation and award administration requirements and the issuance of new policies and directives in the proposal and award process.

In fulfilling their role as stewards of research, including training the next generation of researchers, organizations should demonstrate robust leadership and oversight; establish and administer policies to promote transparency and guard against conflicts of interest and commitment; provide training, support, and information on research security; ensure effective mechanisms for compliance with organizational policies; and implement processes to assess and manage potential risks associated with collaborations and data.

Proposers should also describe their approach to including within the on-line training module, best practices that research organizations can adopt to help preserve openness and collaboration while maintaining the security and integrity of the research enterprise. Recommended practices span five broad categories:

1. Demonstrate organizational leadership and oversight;
2. Establish an expectation of openness and transparency;

3. Provide and share training, support, and information;
4. Ensure effective mechanisms for compliance with organizational policies; and
5. Manage potential risks associated with collaborations and data.

#### 4. Is international collaboration encouraged?

International collaboration is essential to pursuing the frontiers of science. A great asset of U.S. research and engineering enterprise is the diversity of talent — domestic and international. Recipients should develop training that emphasizes that principled international collaboration is critical to success, but that improper foreign influence is a threat to international collaboration in the S&T enterprise. It is important to distinguish the difference.

- International collaboration is welcomed and encouraged. Principled international collaboration:
  - Enables cutting-edge research that no nation can achieve alone;
  - Trains a robust S&T workforce capable of solving global problems;
  - Allows for significant contributions from international students and scholars to the U.S. research enterprise;
  - Strengthens scientific & diplomatic relations; and
  - Leverages resources, including funding, expertise, and facilities.

#### Product and Content

Recipients will be required to work with the "content expert group," which is comprised of representatives from NSF, NIH, DOE, DOD, and the Federal Bureau of Investigation (FBI) staff experts in research security, to develop the content of on-line research security training for the end user. Expectations for the development of training modules include the following components:

- In the content development phase, recipients will be expected to hold consultation sessions with the target audience group to gain insight and perspective regarding outstanding questions and issues that should be addressed through this training. Discussions with stakeholders is an important component of this training development process due to the complexity of the content.
- Recipients will be expected to administer system and content testing with focus groups, once the training has been developed and prior to release. Parameters set by the Paperwork Reduction Act must be considered when compiling focus groups.
- Recipients also should rely on best practices and existing information on the federal research security sector. A non-exhaustive list of resources is as follows:
  - Presidential Memorandum on United States Government-Supported Research and Development (Jan. 2021), [National Security Policy National Security Presidential Memorandum 33 \(NSPM-33\)](#);
  - JASON funded study (Dec. 2019), "[Fundamental Research Security](#)", and
  - MITRE funded study (Dec. 2020), "[Improper Influence in Federally Funded Fundamental Research](#)."
- Recipients will determine the training format for the most suitable approach, which should be timely, informative, engaging, and easily accessible at no cost to the end user. Recipients are encouraged to incorporate existing best practices in education and training appropriate for the target audience.
- The on-line training modules must be accessible through internet-based browsers that are widely available. The training may include animation, interactive graphics, and informative content to enhance the user experience and best communicate the concepts and material presented. Some general considerations are as follows:
  - Platforms: examples include, but are not limited to, interactive online modules; videos or case studies with supporting discussion materials, problems, etc.; Massive Online Open Courses (MOOCs); and computer-video simulations.
- Recipients must work with the "content expert group" to develop the training for each content module, host the training platform, and provide support services and products as defined during the development phases.
- Appropriate quantitative and qualitative success metrics will be essential during the content development process. Recipients are encouraged to incorporate existing best practices in evaluation. For example:
  - Collection of feedback during user group testing and modifications made based on customer response, such as ease of use and demonstration of the content learned;
  - A compilation of FAQs based on customer feedback during user group testing, which could be used to improve the final training; and
  - Frequency data with which products are accessed and training is completed to collect after the training launch.
- The type of work and expertise required for the overall project includes curriculum development experts and IT software and hardware developers as proposed by the proposer when determining the most suitable training approach. For this training, the content shall include at least ONE of the four topic modules as specified in the section entitled, "Topical Areas for Training Modules."

#### Anticipated Timeline and Milestones

For all tasks, proposers will develop milestones regarding focus group discussions, user group testing, benchmark, and delivery of training modules. This includes curriculum development, training deliverables, and associated communication strategies for providing the most affective online training to the target audience.

- Recipients will be expected to deliver the on-line training module pertaining to one of the specific areas of focus as described in the "Topical Areas for Training Module" section.
- Recipients will be required to attend a kick-off meeting that includes the PI and co-PIs, cognizant program staff, and team leads from partner federal agencies to discuss content and finalize the expected deliverables in conjunction with the timeline of milestones and expected delivery date of the final training product.
- Recipients will meet virtually with the "content expert group" periodically throughout the curriculum and technological development process. Regular email communication also will be expected.
- The anticipated delivery date of the initial training modules will be 12 months from the start date of the cooperative agreement.

### III. AWARD INFORMATION

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**Anticipated Type of Award:** Cooperative Agreement

**Estimated Number of Awards:** 1 to 3

**Anticipated Funding Amount:** \$1,500,000

\$1,500,000 for this competition, pending the availability of funds.

Subject to availability of funds and quality of proposals, each project is anticipated to total up to \$500,000, inclusive of both direct and indirect costs.

## IV. ELIGIBILITY INFORMATION

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### 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 labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.

### Who May Serve as PI:

There are no restrictions or limits.

### Limit on Number of Proposals per Organization:

Each training module proposal must address ONE of the four topical areas identified in Section II Program Description. A proposer, however, is authorized to submit separate proposals for more than one topical area. There are no limits on the number of proposals per organization.

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

There are no restrictions or limits.

### Additional Eligibility Info:

*Foreign organizations and foreign individuals are not eligible to submit proposals or receive funding under this solicitation.*

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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### A. Proposal Preparation Instructions

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**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](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](mailto: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](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](mailto: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.D.3 provides additional information on collaborative proposals.

See PAPPG Chapter II.C.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.

### B. Budgetary Information

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## Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

## C. Due Dates

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

May 23, 2022

## D. Research.gov/Grants.gov Requirements

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### 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](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 1-800-673-6188 or e-mail [rgov@nsf.gov](mailto: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](mailto: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 the NSF FastLane system for further processing.

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

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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/](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 *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. 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

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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.C.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.C.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 above criteria, the following will be used in the merit review process:

### Innovation

Taking into consideration the nature of the proposed research education program, does the proposer make a strong case for this program effectively reaching an audience in need of the program's offerings? Where appropriate, is the proposed program developing or utilizing innovative approaches and latest best practices to improve the knowledge and/or skills of the intended audience?

### Approach



Does the proposed program clearly state its goals and objectives, including the educational level of the audience to be reached, the content to be conveyed, and the intended outcome? Is there evidence that the program is based on a sound rationale, as well as sound educational concepts and principles? Is the plan for evaluation sound and likely to provide information on the effectiveness of the program?

Are the proposed modules and their digital material in standard and shareable format, and easily available to the public at no cost?

#### **Environment**

Will the scientific and educational environment of the proposed training contribute to its intended goals? Is there a plan to take advantage of this environment to enhance the educational value of the training? Is there tangible evidence of institutional commitment? Where appropriate, is there evidence of collaboration and buy-in among participating programs, departments, and organizations?

## **B. Review and Selection Process**

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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 applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees 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 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**

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### **A. Notification of the Award**

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Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. 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**

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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](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](mailto: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](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg).

#### **Special Award Conditions:**

Any cooperative agreement awarded in response to this solicitation will contain the following term and condition:

#### **Ensuring Adequate COVID-19 Safety Protocols**

(a) This clause implements Section 3(b) of Executive Order 14042, "Ensuring Adequate COVID Safety Protocols for Federal Contractors", dated September 9, 2021 (published in the Federal Register on September 14, 2021, 86 FR 50985). Note that the Department of Labor has included "cooperative agreements"

within the definition of "contract-like instrument" in its rule referenced at Section 2(e) of this Executive Order, which provides:

For purposes of this order, the term "contract or contract-like instrument" shall have the meaning set forth in the Department of Labor's proposed rule, "Increasing the Minimum Wage for Federal Contractors," 86 Fed. Reg. 38816, 38887 (July 22, 2021). If the Department of Labor issues a final rule relating to that proposed rule, that term shall have the meaning set forth in that final rule.

(b) The awardee must comply with all guidance, including guidance conveyed through Frequently Asked Questions, as amended during the performance of this award, for awardee workplace locations published by the Safer Federal Workforce Task Force (Task Force Guidance) at <https://www.saferfederalworkforce.gov/contractors/>.

(c) *Subawards*. The awardee must include the substance of this clause, including this paragraph (c), in subawards at any tier that exceed the simplified acquisition threshold, as defined in Federal Acquisition Regulation 2.101 on the date of subaward, and are for services, including construction, performed in whole or in part within the United States or its outlying areas. That threshold is presently \$250,000.

(d) *Definition*. As used in this clause -

*United States or its outlying areas* means -

(1) The fifty States;

(2) The District of Columbia;

(3) The commonwealths of Puerto Rico and the Northern Mariana Islands;

(4) The territories of American Samoa, Guam, and the United States Virgin Islands; and

(5) The minor outlying islands of Baker Island, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Midway Islands, Navassa Island, Palmyra Atoll, and Wake Atoll.

(e) The Foundation will take no action to enforce this article, where the place of performance identified in the award is in a U.S. state or outlying area subject to a court order prohibiting the application of requirements pursuant to the Executive Order (hereinafter, "Excluded State or Outlying Area"). A current list of such Excluded States and Outlying Areas is maintained at <https://www.saferfederalworkforce.gov/contractors/>.

## C. Reporting Requirements

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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](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg).

## VIII. AGENCY CONTACTS

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*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:

- Rebecca L. Keiser, telephone: (703) 292-8000, email: [rlkeiser@nsf.gov](mailto:rlkeiser@nsf.gov)

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188
- FastLane Help Desk e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).
- Research.gov Help Desk e-mail: [rgov@nsf.gov](mailto: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](mailto:support@grants.gov).

## IX. OTHER INFORMATION

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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

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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.E.6 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**  
(NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
  - Send an e-mail to: [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov)
  - or telephone: (703) 292-8134
- **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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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 awardees 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 applicants 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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