

# NSF 24-571: Correctness for Scientific Computing Systems

## Program Solicitation

### Document Information

#### Document History

- **Posted:** May 9, 2024

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#### National Science Foundation

Directorate for Computer and Information Science and Engineering  
Division of Computing and Communication Foundations  
Office of Advanced Cyberinfrastructure



#### U.S. Dept. of Energy

Office of Science, Office of Advanced Scientific Computing Research

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

August 13, 2024

August 12, 2025

August 11, 2026



### Table Of Contents

Summary of Program Requirements

I. Introduction

II. Program Description

III. Award Information

IV. Eligibility Information

V. Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- B. Budgetary Information
- C. Due Dates
- D. Research.gov/Grants.gov Requirements
- VI. NSF Proposal Processing and Review Procedures
  - A. Merit Review Principles and Criteria
  - B. Review and Selection Process
- VII. Award Administration Information
  - A. Notification of the Award
  - B. Award Conditions
  - C. Reporting Requirements
- VIII. Agency Contacts
- IX. Other Information

## Important Information And Revision Notes

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:

Correctness for Scientific Computing Systems (CS<sup>2</sup>)

#### Synopsis of Program:

Correctness for Scientific Computing Systems (CS<sup>2</sup>) is a joint program of the National Science Foundation (NSF) and the Department of Energy (DOE). The program addresses challenges that are both core to DOE's mission and essential to NSF's mission of ensuring broad scientific progress. The program's overarching goal is to elevate correctness as a fundamental requirement for scientific computing tools and tool chains, spanning low-level libraries through complex multi-physics simulations and emerging scientific workflows.

At an elementary level, correctness of a system means that desired behavioral properties will be satisfied during the system's execution. In the context of scientific computing, correctness can be understood, at both the level of software and hardware, as absence of faulty behaviors such as excessive numerical rounding, floating-point exceptions, data races deadlocks, memory faults, violations of specifications at interfaces of system modules, and so on. The CS<sup>2</sup> program puts correctness on an equal footing with performance, the focus of current scientific computing research. This program envisions the necessity of proving correctness even in performant scientific computing systems. Such correctness proofs themselves might rely upon multiple factors, including correctness of static and runtime program analyses. Recognizing that many scientific computing applications are inherently statistical, use probabilistic or

randomized algorithms, and/or deal with uncertain data, probabilistic notions of correctness may be needed. It is also critical to realize that correctness guarantees are provided with respect to some predefined system model. For many reasons, including misspecification, approximation, and defect, the state space allowed by real systems might depart from that model. When this happens, the ability to probe the system to isolate the discrepancy is a key challenge in many domains.

CS<sup>2</sup> requires close and continuous collaboration between researchers in two complementary areas of expertise. One area is scientific computing, which, for this solicitation, is broadly construed to include: models and simulations of scientific theories; management and analysis of data from scientific simulations, observations, and experiments; libraries for numerical computation; and allied topics. The second area is formal reasoning and mechanized proving of properties of programs, which, for this solicitation, is broadly construed to include automatic/interactive/auto-active verification, runtime verification, type systems, abstract interpretation, programming languages, program analysis, program logic, compilers, concurrency, stochastic reasoning, static and dynamic testing, property-based testing, and allied topics.

**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.*

- Anindya Banerjee, telephone: (703) 292-7885, email: [cs2@nsf.gov](mailto:cs2@nsf.gov)
- Damian Dechev, telephone: (703) 292-8910, email: [cs2@nsf.gov](mailto:cs2@nsf.gov)
- Hal Finkel, Program Manager, DOE/SC, telephone: (301) 903-1304, email: [hal.finkel@science.doe.gov](mailto:hal.finkel@science.doe.gov)

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

- 47.070 --- Computer and Information Science and Engineering
- 81.049 --- Office of Science Financial Assistance Program

**Award Information**

**Anticipated Type of Award:** Standard Grant or Continuing Grant

**Estimated Number of Awards:** 5

Approximately 5 awards will be made each year in FY 2025, FY 2026, and FY 2027. Awards of up to \$800,000 per award, exclusive of funding to DOE National Laboratories and their sub-recipients, with durations up to 4 years are anticipated, subject to availability of funds and quality of proposals received.

**Anticipated Funding Amount:** \$18,000,000

\$3M per year from NSF and \$3M per year from DOE.

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds and quality of proposals received.

**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.
- DOE National Laboratories.

#### Who May Serve as PI:

**By the submission deadline, any PI, co-PI, or other senior/key personnel must:**

- be a DOE National Laboratory employee; or
- must hold either:
  - a tenured or tenure-track position, *or*
  - a primary, full-time paid appointment in a research or teaching position

at a US-based campus of an organization eligible to submit to this solicitation (see above), with exceptions granted for family or medical leave, as determined by the submitting organization. Individuals with *primary* appointments at for-profit non-academic organizations or at overseas branch campuses of U.S. institutions of higher education are not eligible.

A project must have at least one (co)-PI with expertise in scientific computing and at least one (co)-PI with expertise in formal reasoning and mechanized proving of properties of programs.

#### Limit on Number of Proposals per Organization:

There are no restrictions or limits.

#### Limit on Number of Proposals per PI or co-PI: 2

An investigator may participate as PI, co-PI, or Senior/Key Personnel in **no more than two (2)** proposals submitted in response to this solicitation, per deadline. An investigator cannot be PI, co-PI, or Senior/Key Personnel **on more than two (2) awards** throughout the life of this program (FY 2025 – FY 2027). A project must have at least one (co)-PI with expertise in scientific computing and at least one (co)-PI with expertise in formal reasoning and mechanized proving of properties of programs.

**These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently.** In the event that an individual exceeds the participation limit, proposals received within the limit will be accepted based on earliest date and time of proposal submission (i.e., the first two proposals received will be accepted, and the remainder will be returned without review). Additionally, a participant who is already PI, co-PI, or Senior/Key Personnel on two (2) awards, can no longer submit a proposal to the program. **No exceptions will be made.**

Proposals submitted in response to this solicitation may not duplicate or be substantially similar to other proposals concurrently under consideration by NSF or the DOE.

### 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](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. submitting organization's local time):

August 13, 2024

August 12, 2025

August 11, 2026

## **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:**

Additional reporting requirements apply. Please see the full text of this solicitation for further information.

## **I. Introduction**

Scientific computing is fundamental to science and engineering in areas as far-ranging as precision manufacturing, simulation of modern power grids, fighting emerging pandemics, and climate modeling. In the modern context, scientific computing is often carried out under tight time schedules, and often involves running highly optimized programs on cutting-edge hardware to obtain the highest possible performance at scale. Not only have the numerical algorithms underlying scientific computing become more complex, but also the supporting hardware and software have become more heterogeneous: they employ multiple concurrency models, different numerical schemes, different number representations, and a variety of accelerators including Graphics Processing Units (GPUs), Tensor Cores, and Matrix Accelerators that differ from each other in subtle ways. At this pace and scale, errors can occur at all levels, risking dissemination of incorrect results, release of flawed tool chains, and slowdown of scientific findings and discoveries. For additional background, please see the reports cited below.

This escalation of complexity and the potential risks from software and hardware errors motivate the need for research in innovative techniques to address correctness challenges. There is sustained interest in the scientific-computing community: several community-wide meetings such as the [2023 DOE/NSF Workshop on Correctness in Scientific Computing](#) ( [report](#) ), the [2017 HPC Correctness Summit](#) , and the annual (since 2017) [International Workshop on Software Correctness for HPC Applications](#) (held as a satellite workshop of the Supercomputing conference) have asserted that ensuring correctness of scientific computing applications is one of the most pressing outstanding challenges faced by the scientific computing community today.

Correctness for Scientific Computing Systems (CS<sup>2</sup>) is a joint program of the National Science Foundation (NSF) and the Department of Energy (DOE). The program addresses challenges that are both core to DOE's mission and essential to NSF's mission of ensuring broad scientific progress. The program's overarching goal is to elevate correctness as a fundamental requirement for scientific computing tools and tool chains, spanning low-level libraries through complex multi-physics simulations and emerging scientific workflows.

At an elementary level, correctness of a system means that desired behavioral properties will be satisfied during the system's execution. In the context of scientific computing correctness can be understood, at both the level of software and hardware, as absence of faulty behaviors such as excessive numerical rounding, floating-point exceptions, data races deadlocks, memory faults, violations of specifications at interfaces of system modules, and so on. The CS<sup>2</sup> program puts correctness on an equal footing with the focus of current scientific computing research: performance. The program envisions the necessity of proving correctness, even in performant scientific computing systems. Such correctness proofs themselves might rely upon multiple factors, including correctness of static and runtime program analyses. Recognizing that many scientific computing applications are inherently statistical, use probabilistic or randomized algorithms, and/or deal with uncertain data, probabilistic notions of correctness may be needed. It is also critical to realize that correctness guarantees are provided with respect to some predefined system model. For many reasons, including misspecification, approximation, and defect, the state space allowed by real systems might depart from that model. When this happens, the ability to probe the system to isolate the discrepancy is a key challenge in many domains.

## II. Program Description

The CS<sup>2</sup> program requires close and continuous collaboration between researchers in two complementary areas of expertise. One area is scientific computing, which, for this solicitation, is broadly construed to include: models and simulations of scientific theories; management and analysis of data from scientific simulations, observations, and experiments; libraries for numerical computation; and allied topics. The second area is formal reasoning and mechanized proving of properties of programs, which, for this solicitation, is broadly construed to include automatic/interactive/auto-active verification, runtime verification, type systems, abstract interpretation, programming languages, program analysis, program logics, compilers, concurrency, stochastic reasoning, static and dynamic testing, property-based testing, and allied topics.

The CS<sup>2</sup> program solicits research proposals that advance general theories, principles, and methodologies for verified scientific computing. All proposals must present basic research for making such verification:

- A. modular (that is, layered as opposed to monolithic, with intermediate results proved for each module interface),
- B. end-to-end (that is, connect *program code* to high-level specifications of scientific systems to be approximated); and
- C. machine checked (that is, an overall correctness theorem must be established in a formal logic and must be machine-checkable). As noted above, the correctness guarantee might be defined statistically and might rely on both static and dynamic analysis.

In (sub)sections titled "**Theories and methodologies**", "**Critical Modules**", and "**Evaluation Plan**", respectively, a project must address these **basic requirements**:

1. Propose generalizable theories and methodologies for proving correctness of scientific computing systems; define and justify appropriate correctness criteria; provide examples of correctness violations.

2. Identify (with justification) critical modules of at least two scientific computing applications, *already recognized as highly performant*.

(a) Demonstrate how theories and methodologies developed in (1) can be instantiated/adapted to accomplish full proofs of correctness of implementations of the chosen modules.

(b) Provide examples of abstractions that may aid proofs of correctness: argue how the abstractions may help achieve (A) – (C) above.

(c) Discuss salient assumptions on e.g., external libraries, tools, and hardware; where meaningful, discuss technical approaches for discharging the assumptions.

3. Present an evaluation plan that includes a timeline and outlines success metrics.

**An essential end goal of a proposed project should be evidence, by way of machine-checked mathematical proof, that the chosen critical modules of the applications satisfy stated correctness properties.**

A project is not required to perform complete end-to-end proofs of correctness of the scientific applications, although furnishing such proofs should be the project's ultimate aim. Accordingly, a project should (at least informally) state and justify overall correctness criteria for the chosen applications and explain how the proposed work addresses key challenges to accomplishing end-to-end proofs.

A project may include runtime testing/verification components. However, the research should aim to demonstrate some provable guarantee regarding the effectiveness or completeness of the testing. Similarly, the proposed research may include runtime testing of verified systems that can efficiently and effectively isolate discrepancies between the real system behavior and the model underlying the verification guarantee.

The chosen scientific applications may contain components implementing artificial intelligence (AI) and machine learning (ML) algorithms but must include substantial procedural or functional components in addition to the AI/ML components. Rigorous reasoning techniques should be employed for demonstrating correctness of all components (including AI/ML components) of the selected modules.

Proposals must contain a detailed collaboration plan, included as a Supplementary Document, that clearly highlights and justifies the complementary expertise of the PIs in the areas of scientific computing, and formal methods and mechanized proving, and describes the mechanisms for continuous mutual collaboration.

The following topics are **out of scope** and corresponding projects will be returned without review.

- Projects that focus merely on improving the performance or scalability of the chosen applications.
- Projects that do not offer advancements in formal reasoning for scientific applications.
- Projects focusing on applications written for execution on quantum computers.

Only DOE will provide funding to DOE National Laboratories and their sub-recipients, while both NSF and DOE may provide funding to other selected institutions. Proposed projects are not required to include DOE National Laboratories, but projects including DOE National Laboratories should target applications of relevance to one or more [DOE SC programs](#). Collaborative proposals are encouraged.

### **III. Award Information**

**Anticipated Type of Award:** Standard Grant or Continuing Grant

**Estimated Number of Awards:** Approximately 5 per year.

Approximately 5 awards will be made each year in FY 2025, FY 2026, and FY 2027. Awards of up to \$800,000 per award, exclusive of funding to DOE National Laboratories and their sub-recipients, with durations up to 4 years are anticipated, subject to availability of funds and quality of proposals received.

**Anticipated Funding Amount:** \$3M per year from NSF and \$3M per year from DOE.

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds and quality of proposals received.

#### **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.
- DOE National Laboratories.

##### **Who May Serve as PI:**

**By the submission deadline, any** PI, co-PI, or other senior/key personnel must:

- be a DOE National Laboratory employee; or
- must hold either:
  - a tenured or tenure-track position, *or*
  - a primary, full-time paid appointment in a research or teaching position

at a US-based campus of an organization eligible to submit to this solicitation (see above), with exceptions granted for family or medical leave, as determined by the submitting organization. Individuals with *primary* appointments at for-profit non-academic organizations or at overseas branch campuses of U.S. institutions of higher education are not eligible.

A project must have at least one (co)-PI with expertise in scientific computing and at least one (co)-PI with expertise in formal reasoning and mechanized proving of properties of programs.

##### **Limit on Number of Proposals per Organization:**

There are no restrictions or limits.

##### **Limit on Number of Proposals per PI or co-PI: 2**

An investigator may participate as PI, co-PI, or Senior/Key Personnel in **no more than two (2)** proposals submitted in response to this solicitation, per deadline. An investigator cannot be PI, co-PI, or Senior/Key Personnel **on more than two (2) awards** throughout the life of this program (FY 2025 – FY 2027). A project must have at least one (co)-PI with expertise in scientific computing and at least one (co)-PI with expertise in formal reasoning and mechanized proving of properties of programs.

**These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently.** In the event that an individual exceeds the participation limit, proposals received within the limit will be accepted based on earliest date and time of proposal submission (i.e., the first two proposals received will be accepted, and the remainder will be returned without review). Additionally, a participant who is already PI, co-PI, or Senior/Key Personnel on two (2) awards, can no longer submit a proposal to the program. **No exceptions will be made.**



Proposals submitted in response to this solicitation may not duplicate or be substantially similar to other proposals concurrently under consideration by NSF or the DOE.

#### **Additional Eligibility Info:**

For U.S. IHE and non-profit, non-academic organizations with overseas campuses/offices, this solicitation restricts eligibility to research activities using the facilities, equipment, and other resources of the campuses/offices located in the US only.

Further, subawards are not permitted to overseas campuses/offices of US-based proposing organizations.

Only DOE will provide funding to DOE National Laboratories and their sub-recipients, while both NSF and DOE may provide funding to other selected institutions. Proposed projects are not required to include DOE National Laboratories, but projects including DOE National Laboratories should target applications of relevance to one or more [DOE SC programs](#). Collaborative proposals are encouraged.

## **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](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.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.

**Important Information for Proposals from DOE National Laboratories:** If recommended for funding, proposals from DOE National Laboratories will be awarded by DOE. Therefore, the budget from the DOE National Laboratory must be included as a Supplementary Document (see instructions for Supplementary Documents (d), below), and not in the Budget section of the proposal. **No costs should be entered on the NSF budget form;** a budget with \$0 annual budgets and a \$0 cumulative budget will automatically be generated by Research.gov. Since there will be no salaries entered on the NSF budget form for Senior/Key personnel, **the names of the PI and any co-PI(s) or other Senior/Key personnel**

**must be manually removed from Section A of the NSF budget form.** In the Budget Justification section, upload a file that states "Not applicable for proposals submitted by a DOE National Laboratory." Failure to take these steps will prevent the proposal from being submitted.

**Proposal Titles:** Proposal titles must begin with the acronym "**CS<sup>2</sup>**", followed by a colon and followed by the title of the project.

- A single-organization proposal must have a title of the form **CS<sup>2</sup>: Title**.
- A collaborative proposal with PIs from multiple organizations (submitted as separate submissions from multiple organizations) must use the form **Collaborative Research: CS<sup>2</sup>: Title**.

**Project Summary:** Keywords that identify main topics of the proposal must be included at the end of the Overview section of the Project Summary.

**Project Description:** Project Descriptions are limited to 15 pages in length.

In addition to the requirements specified in the PAPPG, including the requirement for a separate section labeled "Broader Impacts," the Project Description must address, in separate (sub)sections titled "**Theories and methodologies**", "**Critical Modules**", and "**Evaluation Plan**", respectively, these **basic requirements** outlined in Section II and repeated below:

1. Propose generalizable theories and methodologies for proving correctness of scientific computing systems. Define and justify appropriate correctness criteria; provide examples of correctness violations.

2. Identify (with justification) critical modules of at least two scientific computing applications, *already recognized as highly performant*;

(a) Demonstrate how theories and methodologies developed in (1) can be instantiated/adapted to accomplish full correctness proofs of implementations of the chosen modules during the project.

(b) Provide examples of abstractions that may aid proofs of correctness: argue how the abstractions may help make verification modular, end-to-end, and machine-checkable (see points (A) – (C), Section II).

(c) Discuss salient assumptions on e.g., external libraries, tools, and hardware; where meaningful, discuss technical approaches for discharging the assumptions.

3. Present an evaluation plan that includes a timeline and outlines success metrics.

An essential end goal of a proposed project should be evidence, by way of machine-checked mathematical proof, that the chosen critical modules of the applications satisfy stated correctness properties.

**A proposal which fails to address the PAPPG requirements, and the basic requirements above will be returned without review.**

**Supplementary Documents:** In addition to the guidance in the PAPPG, upload the following:

(a) A list of **Project Personnel and Partner Institutions** (required) (Note: In collaborative proposals, the lead organization should provide this information for all participants):

Provide current, accurate information for all personnel and organizations involved in the project. NSF staff will use this information in the merit review process to manage reviewer selection. The list must include all PIs, co-PIs, Senior/Key Personnel, funded/unfunded Consultants or Collaborators, Subawardees, Postdoctoral Researchers, and project-level advisory committee members. This list should be numbered and include (in this order) Full name, Organization(s), and Role in the project, with each item separated by a semi-colon. Each person listed should start a new numbered line. For example:

1. Mei Lin; XYZ University; PI
2. Jak Jabes; University of PQR; Senior Personnel

3. Jane Brown; XYZ University; Postdoctoral Researcher
4. Raket Ademas; ABC Inc.; Funded Consultant
5. Maria Wan; Welldone Institution; Unfunded Collaborator
6. Rimom Greene; ZZZ University; Subawardee

(b) **Data Management and Sharing Plan (required):** See Chapter II.D.2 of the PAPPG for full policy implementation.

For additional information on the Dissemination and Sharing of Research Results, see:

<https://www.nsf.gov/bfa/dias/policy/dmp.jsp>.

(c) **Collaboration Plan (required):** All projects, whether involving a single institution or multiple institutions, must include a Collaboration Plan submitted by the (lead) institution as a separate Supplementary Document (limited to 3 pages). This plan must describe the distinct expertise provided by the PIs as required above under "Who May Serve as PI" as well as plans for working together to advance knowledge in scientific computing; formal reasoning and mechanized proving of properties of programs; and, most crucially, in the intersection of these topics. Joint supervision of students and postdoctoral researchers is strongly encouraged. The collaboration plan must also describe clear measures of success and a plan for evaluating success.

**Projects without a Collaboration Plan will be returned without review.**

(d) **DOE budget and budget justification (required for all projects involving the National Laboratories).** The budget should be provided using the standard SF-424 Research & Related (R&R) Budget form.

## **B. Budgetary Information**

### **Cost Sharing:**

Inclusion of voluntary committed cost sharing is prohibited.

### **Budget Preparation Instructions:**

Projects are limited to \$800,000 in total budget, with durations of up to four years, exclusive of funding to participating DOE National Laboratories. DOE National Laboratories, whether proposers or proposed sub-recipients, may request up to \$500,000 per year. This limit applies to the aggregated total budgets of all participating DOE National Laboratories in each proposed project.

While DOE National Laboratories may be proposed as sub-recipients on proposals from an eligible IHE or non-profit, non-academic organization, if recommended for an award, the funding for the DOE National Laboratory will be awarded by DOE and the amount of any such proposed subaward will be removed from the prime recipient's award from NSF. DOE National Laboratories and other eligible organizations selected to receive funding from DOE will be required to make an additional proposal submission to DOE. Relevant selected organizations will be provided with specific instructions by DOE.

DOE National Laboratories should detail their budgets only in a Supplementary Document (d) as indicated above. For collaborative projects involving PIs from DOE National Laboratories, the Budget Justification sections from all other PIs should clearly differentiate their budgets from any similar funds requested in the DOE budgets and justify their full requested budgets.

### **CS<sup>2</sup> PI Meeting**

The CS<sup>2</sup> program is aiming to grow a new research community. In this spirit, the program plans to host virtual and/or in-person PI meetings during the program, with participation from all funded PIs along with other representatives from the research community, government, and industry. For each award, at least one collaborating PI focusing on scientific computing and at least one PI focusing on formal reasoning, verification, and mechanized proofs are expected to attend the PI meeting. Students and postdoctoral scholars involved in funded projects will also be encouraged to attend these

meetings. As part of its budget for each year, each proposal must include the costs of attending in-person CS<sup>2</sup> PI meetings for a minimum of two PIs and two students or postdocs.

### C. Due Dates

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

August 13, 2024

August 12, 2025

August 11, 2026

Every Second Tuesday in August for FY24, 25, and 26.

### 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/ProposalPreparation](https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparation) For Research.gov user support, call the Research.gov Help Desk at 1-800-381-1532 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/applicants>. 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 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/](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 and Sharing Plan and the Mentoring Plan, as appropriate.

#### **Additional Solicitation Specific Review Criteria**

Proposals will be evaluated based on the following solicitation-specific review criteria:

- (a) The extent to which fundamental contributions at the intersection of scientific computing and formal methods, verification, and mechanized proving are a likely outcome of this project.
- (b) The extent to which the proposed project meets the **basic requirements** identified in Section II (Project Description) of this solicitation.
- (c) The strength of the Collaboration Plan (as outlined in Section V.A.) of this solicitation.

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

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

NSF will manage and conduct the peer review process for this solicitation; DOE may recommend reviewers and DOE staff may attend the review panels as observers, and may, upon request, receive copies of proposals and the unattributed reviews and panel summaries as part of the review process. For proposals from DOE National Laboratories and other eligible organizations that are recommended for funding by DOE will be provided with additional guidance and instructions.

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](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).

### **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:**

An annual Principal Investigator(s) meeting will be held to discuss scientific and policy issues of interest to awarded PIs and to facilitate communication and collaboration across the community. Students and postdoctoral fellows involved in funded projects will also be encouraged to attend these meetings.

Recipients on projects funded by both NSF and DOE are required to include appropriate acknowledgment of both NSF and DOE/SC support in publications, presentations, reports, press releases, websites, and/or social media on work performed under an award. NSF recipients will follow the NSF award terms and conditions for NSF reporting requirements and, similarly, DOE/SC recipients will follow the DOE/SC award terms and conditions for DOE/SC reporting requirements. Examples of such acknowledgment would be "This material is based upon work jointly supported by the U.S. DOE, Office of Science (SC), Advanced Scientific Computing Research under Award Number [Recipient should enter the SC award number] and NSF." or "This material is based upon work jointly supported by NSF under Award Number [Recipient should enter the NSF award number] and U.S. DOE, Office of Science", as applicable.

If the funding agency is DOE/SC, the submitter of the proposal may be asked to withdraw the proposal from NSF and resubmit the proposal through the then-available "Continuance of Solicitation for the Office of Science Financial Assistance Program" DOE/SC Funding Opportunity Announcement (FOA) in Grants.gov. In these cases, DOE/SC evaluation and selection criteria and award procedures and requirements will apply. DOE National Laboratories selected for funding will be asked to submit the necessary documentation for funding through the DOE field work authorization system or other appropriate process specified by DOE.

### **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 annual project report, and a project outcomes report for the general public.

Failure to provide the required annual or final annual 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 annual 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).

DOE funded organizations will be responsible for submitting progress reports and any other documents to DOE as required by the terms of the award. DOE National Laboratories will be required to submit progress reports and other documentation as directed by the funding DOE/SC program office.

Information from annual and final project reports submitted to either NSF or DOE will be shared between the two agencies.

## **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:

- Anindya Banerjee, telephone: (703) 292-7885, email: [cs2@nsf.gov](mailto:cs2@nsf.gov)
- Damian Dechev, telephone: (703) 292-8910, email: [cs2@nsf.gov](mailto:cs2@nsf.gov)
- Hal Finkel, Program Manager, DOE/SC, telephone: (301) 903-1304, email: [hal.finkel@science.doe.gov](mailto:hal.finkel@science.doe.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](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

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

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

## About The National Science Foundation

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

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

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

*Facilitation Awards for Scientists and Engineers with Disabilities (FASSED)* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures*

Guide Chapter II.F.7 for instructions regarding preparation of these types of proposals.

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

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

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

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

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (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

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

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

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

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[Plain language](#) |



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