Expanding TRIPODS through Partnerships (XTRIPODS)

PROGRAM SOLICITATION

NSF 23-591

National Science Foundation
Directorate for Computer and Information Science and Engineering
Division of Computing and Communication Foundations
Directorate for Mathematical and Physical Sciences
Division of Mathematical Sciences
Directorate for Engineering
Division of Electrical, Communications and Cyber Systems

Submission Window Date(s) (due by 5 p.m. submitter's local time):

August 02, 2023 - August 16, 2023

February 15, 2024 - March 01, 2024

IMPORTANT INFORMATION AND REVISION NOTES

Update: The limit on the number of proposals per investigator is clarified to indicate that each investigator can participate in up to one proposal per submission window.

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:

Expanding TRIPODS through Partnerships (XTRIPODS)

Synopsis of Program:

Through this solicitation the Division of Computing and Communication Foundations (CCF) in the directorate for Computer and Information Science and Engineering (CISE), the Division of Mathematical Sciences (DMS) in the Directorate for Mathematical and Physical Sciences (MPS), and the Division of Electrical, Communications and Cyber Systems (ECCS) in the Directorate for Engineering (ENG) of the National Science Foundation (NSF) will support the continued growth of a broad and diverse interdisciplinary research community for the advancement of data science, providing a unique opportunity to broadly promote the NSF vision and core values, especially inclusion and collaboration. The Expanding Transdisciplinary Research in Principles of Data Science through Partnerships (XTRIPODS) program, which leverages the existing TRIPODS program, aims to broaden participation in data science research, education, and workforce development by supporting partnerships between the current TRIPODS Phase II Institutes and Institutions of Higher Education (IHEs) that do not traditionally receive significant amounts of NSF funding. Only institutions that are not classified as Carnegie Research 1 (R1) universities are eligible. Non-R1 Minority-Serving Institutions (MSIs), women's colleges, and institutions that primarily serve persons with disabilities, as well as Predominantly Undergraduate Institutions (PUIs), are especially encouraged to apply.

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.

- Eyad Abed, Program Director, ENG/ECCS, telephone: (703) 292-2303, email: nsftripodsworkgrp@nsf.gov
- Funda Ergun, Program Director, CISE/CCF, telephone: (703) 292-8910, email: nsftripodsworkgrp@nsf.gov

- Yulia Gel, Program Director, MPS/DMS, telephone: (703) 292-7888, email: nsftripodsworkgrp@nsf.gov
- Yuliya Gorb, Program Director, MPS/DMS, telephone: (703) 292-2113, email: nsftripodsworkgrp@nsf.gov
- Tracy Kimbrel, Program Director, CISE/CCF, telephone: (703) 292-8910, email: nsftripodsworkgrp@nsf.gov
- Anthony Kuh, Program Director, ENG/ECCS, telephone: (703) 292-4714, email: nsftripodsworkgrp@nsf.gov
- Stacey Levine, Program Director, MPS/DMS, telephone: (703) 292-2948, email: nsftripodsworkgrp@nsf.gov
- Edsel A. Pena, Program Director, MPS/DMS, telephone: (703) 292-8080, email: nsftripodsworkgrp@nsf.gov
- Phillip A. Regalia, Program Director, CISE/CCF, telephone: (703) 292-2981, email: nsftripodsworkgrp@nsf.gov
- Christopher W. Stark, Program Director, MPS/DMS, telephone: (703) 292-4869, email: nsftripodsworkgrp@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.070 --- Computer and Information Science and Engineering

Award Information

Anticipated Type of Award: Standard Grant or Supplement

Estimated Number of Awards: 10 to 16

10 to 16 new awards, as well as 10 to 16 associated supplements as described herein, are anticipated.

Anticipated Funding Amount: $2,000,000 to $4,000,000

Up to $200,000 total budget per project may be requested for each new award.

A separate supplement to an existing TRIPODS Phase II award of up to $50,000 may be requested in association with each new award.

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

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Only Institutions of Higher Education (IHEs) not currently classified as a Doctoral University with "Very High Research Activity" (R1 institutions) according to the Carnegie Classification: https://carnegieclassifications.acenet.edu are eligible. These include 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. PIs from non-R1 Minority-Serving Institutions (MSIs), women's colleges, and institutions that primarily serve persons with disabilities, as well as Predominantly Undergraduate Institutions (PUIs), are especially encouraged to apply.

  Only (non-R1) eligible organizations that have received a Letter of Collaboration from a PI or co-PI of an existing TRIPODS Phase II Institute as described later in this solicitation may submit a proposal.

  Current TRIPODS Phase II awardee institutions are eligible only as recipients of supplements to TRIPODS Phase II awards as described later in this solicitation.

  Eligible Partners

  Eligible partners include TRIPODS Phase II Institutes as listed below:

  - Foundations of Data Science Institute (FODSI)
  - Institute for Data, Econometrics, Algorithms, and Learning (IDEAL)
  - Institute for Emerging CORE Methods in Data Science (EnCORE)
  - Institute for Foundations of Data Science (IFDS)

Who May Serve as PI:

By the submission deadline, any PI, co-PI, or other senior project personnel 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). Individuals with primary appointments at overseas branch campuses of US IHEs are not eligible.

NSF seeks to enhance engagement in data science by encouraging submission of proposals to this solicitation that include the participation of the full spectrum of diverse talent, e.g. as PI, co-PI, Senior Personnel, postdoctoral scholars, graduate or undergraduate students or trainees. One of the goals of this program is to ensure that diversity and merit frameworks work harmoniously without compromising one for the other.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An investigator may participate in any role (PI, co-PI, or Senior Personnel) in at most one proposal in each submission window.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

- **Cost Sharing Requirements:**

  Inclusion of voluntary committed cost sharing is prohibited.

- **Indirect Cost (F&A) Limitations:**

  Not Applicable

- **Other Budgetary Limitations:**

  Not Applicable

C. Due Dates

- **Submission Window Date(s)** (due by 5 p.m. submitter's local time):

  August 02, 2023 - August 16, 2023

  February 15, 2024 - March 01, 2024

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria apply.

Award Administration Information

Award Conditions:

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

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

The XTRIPODS program aims to support the continued growth of a broad and diverse interdisciplinary research community for the advancement of data science, providing a unique opportunity to broadly promote the NSF vision and core values, especially inclusion and collaboration. This program will broaden participation in data science research, education, and workforce development by supporting partnerships between the current TRIPODS Phase II Institutes and Institutions of Higher Education (IHEs) that do not traditionally receive significant amounts of NSF funding. Only institutions that are not classified as Carnegie Research 1 (R1) universities are eligible. Non-R1 Minority-Serving Institutions (MSIs), women's colleges, and institutions that primarily serve persons with disabilities, as well as Predominantly Undergraduate Institutions (PUIs), are especially encouraged to apply.

II. PROGRAM DESCRIPTION

Non-R1 universities are sources of underutilized talent that will be important for future data science innovation. The XTRIPODs program promotes partnerships between these institutions and TRIPODS Phase II Institutes. Expanding the diversity of participation in data science research is critical to advancing the field, conducting responsible data science research through more inclusive participatory design, and promoting positive societal outcomes of data science innovation. Where these institutions are not yet significantly engaged in data science research and education there is untapped potential to increase talent development and collaboration through federally supported research. These activities are intended to be a driving force for strengthening and diversifying U.S. research and education pathways and providing historically marginalized communities new opportunities in STEM careers.

Interested PIs should contact one of the four TRIPODS Phase II Institutes using the links below to develop a collaborative project.

Foundations of Data Science Institute (FODSI)

https://fodsi.us/nsf-application.html

Institute for Data, Econometrics, Algorithms, and Learning (IDEAL)

https://www.ideal-institute.org/

Institute for Emerging CORE Methods in Data Science (EnCORE)

https://encore.ucsd.edu/expand-tripods/

Institute for Foundations of Data Science (IFDS)

https://ifds.info/

Researchers and educators at non-R1 institutions and TRIPODS personnel who form partnerships via these contacts should jointly develop proposals to be submitted by the non-R1 institution as described later in this solicitation.

Proposals must clearly describe how the project meets the following two goals:

1. Expanding participation in data science research to faculty, students, and institutions that are not currently engaged.
2. Extending the impact of the existing TRIPODS Institute via well-planned collaborative research and/or education activities consistent with the stated goals of the TRIPODS Institute and those of the TRIPODS program. See the TRIPODS Phase II solicitation https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf21604 for the goals of the TRIPODS program.

III. AWARD INFORMATION

Each Expand TRIPODS award is anticipated to be a standard grant of up to $200,000 (total budget including indirect costs but excluding the supplement described next) over two years. The collaborating PI or co-PI of an existing TRIPODS Phase II Institute partnering with the submitting institution may request a supplement of up to $50,000 to the existing TRIPODS Phase II award to support the collaboration.

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

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Only Institutions of Higher Education (IHEs) not currently classified as a Doctoral University with "Very High Research Activity" (R1 institutions) according to the Carnegie Classification: https://carnegieclassifications.acenet.edu are eligible. These include 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. PIs from non-R1 Minority-Serving Institutions (MSIs), women's colleges, and institutions that primarily serve persons with disabilities, as well as Predominantly Undergraduate Institutions (PUIs), are especially encouraged to apply.

  Only (non-R1) eligible organizations that have received a Letter of Collaboration from a PI or co-PI of an existing TRIPODS Phase II Institute as described later in this solicitation may submit a proposal.

  Current TRIPODS Phase II awardee institutions are eligible only as recipients of supplements to TRIPODS Phase II awards as described later in this solicitation.

  Eligible Partners

  Eligible partners include TRIPODS Phase II Institutes as listed below:

  - Foundations of Data Science Institute (FODSI)
  - Institute for Data, Econometrics, Algorithms, and Learning (IDEAL)
  - Institute for Emerging CORE Methods in Data Science (EnCORE)
  - Institute for Foundations of Data Science (IFDS)

Who May Serve as PI:

By the submission deadline, any PI, co-PI, or other senior project personnel 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). Individuals with primary appointments at overseas branch campuses of US IHEs are not eligible.

NSF seeks to enhance engagement in data science by encouraging submission of proposals to this solicitation that include the participation of the full spectrum of diverse talent, e.g. as PI, co-PI, Senior Personnel, postdoctoral scholars, graduate or undergraduate students or trainees. One of the goals of this program is to ensure that diversity and merit frameworks work harmoniously without compromising one for the other.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An investigator may participate in any role (PI, co-PI, or Senior Personnel) in at most one proposal in each submission window.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

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

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

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

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

The proposal title should begin with the prefix "XTRIPODS."

The Project Description is limited to ten pages. Details of research, educational, broadening participation, and workforce development activities, as well as the planned collaboration among involved personnel including existing TRIPODS Phase II personnel, must all be described in the Project Description.

A Letter of Collaboration from a PI or co-PI of an existing TRIPODS Phase II Institute **must be included in the proposal.** The Letter of Collaboration must follow the format described in PAPPG Chapter II.D.2. The collaboration of the TRIPODS PI or co-PI must be clearly described and fully contained in the proposal's Project Summary and Project Description.

For each proposal that is selected for award, the TRIPODS Institute PI or co-PI who provided the letter of collaboration will be invited to submit a supplemental funding request to the TRIPODS award. The Summary of Proposed Work of the supplemental funding request must contain the Project Summary and Project Description of the proposal submitted by the non-R1 institution.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

- **Submission Window Date(s)** (due by 5 p.m. submitter's local time):

  August 02, 2023 - August 16, 2023

  February 15, 2024 - March 01, 2024

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For Research.gov user support, call the Research.gov Help Desk at 1-800-673-6188 or e-mail rgov@nsf.gov. The Research.gov Help Desk answers general technical questions related to the use of the Research.gov system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

1. What is the potential for the proposed activity to
    a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
    b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?

4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

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

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

B. Review and Selection Process

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

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

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell 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 or the Division of Acquisition and Cooperative Support for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

*These documents may be accessed electronically on NSF's Website at https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF.

Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

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

Administrative and National Policy Requirements

Build America, Buy America

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

Consistent with the requirements of the Build America, Buy America Act (Pub. L. 117-58, Division G, Title IX, Subtitle A, November 15, 2021), no funding made available through this funding opportunity may be obligated for an award unless all iron, steel, manufactured products, and construction materials used in the project are produced in the United States. For additional information, visit NSF's Build America, Buy America webpage.

Special Award Conditions:

The TRIPODS program has annual PI meetings (which may be in person or virtual), as well as annual site visits (which may be in person, virtual, or "reverse," meaning that they are held near NSF headquarters). Principal Investigators for the new Expand TRIPODS awards should plan to attend and to contribute to these meetings/site visits and may include travel expenses to attend these meetings/site visits in their budget requests.

C. Reporting Requirements

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

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

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

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

VIII. AGENCY CONTACTS

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

General inquiries regarding this program should be made to:

- Eyad Abed, Program Director, ENG/ECCS, telephone: (703) 292-2303, email: nsftripodsworkgrp@nsf.gov
- Funda Ergun, Program Director, CISE/CCF, telephone: (703) 292-8910, email: nsftripodsworkgrp@nsf.gov
- Yulia Gel, Program Director, MPS/DMS, telephone: (703) 292-7888, email: nsftripodsworkgrp@nsf.gov
- Yuliya Gorb, Program Director, MPS/DMS, telephone: (703) 292-2113, email: nsftripodsworkgrp@nsf.gov
- Tracy Kimbrel, Program Director, CISE/CCF, telephone: (703) 292-8910, email: nsftripodsworkgrp@nsf.gov
- Anthony Kuh, Program Director, ENG/ECCS, telephone: (703) 292-4714, email: nsftripodsworkgrp@nsf.gov

- Stacey Levine, Program Director, MPS/DMS, telephone: (703) 292-2948, email: nsftripodsworkgrp@nsf.gov
- Edsel A. Pena, Program Director, MPS/DMS, telephone: (703) 292-8080, email: nsftripodsworkgrp@nsf.gov
- Phillip A. Regalia, Program Director, CISE/CCF, telephone: (703) 292-2981, email: nsftripodsworkgrp@nsf.gov
- Christopher W. Stark, Program Director, MPS/DMS, telephone: (703) 292-4869, email: nsftripodsworkgrp@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-673-6188
- Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

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

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (703) 292-5111

(NSF Information Center):

- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**

  Send an e-mail to: nsfpubs@nsf.gov

  or telephone: (703) 292-8134

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

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by 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:

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