

Strengthening American Infrastructure (SAI)

PROGRAM SOLICITATION NSF 22-564



National Science Foundation

Directorate for Social, Behavioral and Economic Sciences

Directorate for Biological Sciences

Directorate for Computer and Information Science and Engineering

Directorate for Education and Human Resources

Directorate for Engineering

Directorate for Geosciences

Directorate for Mathematical and Physical Sciences

Office of Integrative Activities

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

May 05, 2022

IMPORTANT INFORMATION AND REVISION NOTES

Important Information

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

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

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Strengthening American Infrastructure (SAI)

Synopsis of Program:

Strengthening American Infrastructure (SAI) is an NSF Program seeking to stimulate human-centered fundamental and potentially transformative research aimed at strengthening America's infrastructure. Effective infrastructure provides a strong foundation for socioeconomic vitality and broad quality of life improvement. Strong, reliable, and effective infrastructure spurs private-sector innovation, grows the economy, creates jobs, makes public-sector service provision more efficient, strengthens communities, promotes equal opportunity, protects the natural environment, enhances national security, and fuels American leadership. Achieving these objectives requires the integration of expertise from across all science and engineering disciplines. SAI focuses on how fundamental knowledge about human reasoning and decision-making, governance, and social and cultural processes enables the building and maintenance of effective infrastructure that improves lives and society and builds on advances in technology and engineering. Successful projects will represent a convergence of expertise in one or more SBE sciences deeply integrated with other disciplines to support substantial and potentially pathbreaking, fundamental research applied to strengthening a specific and focal infrastructure.

General inquiries regarding this funding opportunity should be sent to NSF-SAI@nsf.gov.

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.

- Steven Breckler, Program Director, SBE, telephone: (703) 292-7369, email: sbreckle@nsf.gov

- Michael Hout, SBE, telephone: (703) 292-2163, email: mhout@nsf.gov
- Sara Kiesler, SBE, telephone: (703) 292-8643, email: skiesler@nsf.gov
- Jeremy Koster, SBE, telephone: (703) 292-8740, email: jkoster@nsf.gov
- Kristin E. Kuyuk, SBE, telephone: (703) 292-4904, email: kkuyuk@nsf.gov
- Joseph M. Whitmeyer, SBE, telephone: (703) 292-7808, email: jwhitmey@nsf.gov
- Darleen L. Fisher, CISE, telephone: (703) 292-8950, email: dlfisher@nsf.gov
- Michael Ford, EHR, telephone: (703) 292-5153, email: miford@nsf.gov
- Gianluca Cusatis, ENG, telephone: (703) 292-5026, email: gcusatis@nsf.gov
- David A. Sutherland, GEO, telephone: (703) 292-8030, email: dasuther@nsf.gov
- Robert Meulenberg, MPS, telephone: (703) 292-7106, email: rmeulenb@nsf.gov
- Randy L. Phelps, OIA, telephone: (703) 292-8040, email: rphelps@nsf.gov
- Amanda A. Simcox, BIO, telephone: (703) 292-8470, email: asimcox@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.083 --- Office of Integrative Activities (OIA)

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 35

Up to 10 Planning Grant Awards, up to 15 Research Grant Awards, and up to 10 Conference Awards.

The number of awards is dependent upon the proposals received and the degree to which proposals meet the solicitation goals and NSF merit review criteria.

Anticipated Funding Amount: \$10,000,000

Up to \$10.0 million pending the availability of funds and quality of proposals.

Three classes of proposals will be considered through this solicitation:

- SAI Planning Grants (SAI-P) may be requested for a total budget not to exceed \$150,000 and for a period of up to 1 year.
- SAI Research Grants (SAI-R) may be requested for a total budget not to exceed \$750,000 and for a period of up to 3 years.
- SAI Conference Grants (SAI-C) may be requested for a total budget not to exceed \$50,000 and for a period of up to 1 year.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

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

Who May Serve as PI:

PIs must hold appointments at U.S.-based campuses/offices of eligible organizations (IHEs or Non-profit, non-academic organizations). There are no restrictions, beyond the eligibility outlined in the PAPPG Chapter I.E, on who may serve as co-PIs, Senior Personnel or Consultant (see Categories of Proposers in PAPPG Chapter I.E).

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 individual may appear as PI, co-PI, Senior Personnel, or Consultant on only one proposal submitted in response to this solicitation, totaled across all SAI proposal categories. This eligibility constraint will be strictly enforced. In the event an individual exceeds this limit, the first proposal received prior to the deadline will be accepted and the remainder will be returned without review. This limitation includes proposals submitted by a lead organization, collaborative non-lead proposals, and any subawards included as part of a collaborative proposal involving multiple institutions. No exceptions will be made.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

- **Cost Sharing Requirements:**

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

Not Applicable
- **Other Budgetary Limitations:**

Not Applicable

C. Due Dates

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

May 05, 2022

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

Strong, reliable and effective infrastructure spurs private-sector innovation, grows the economy, creates jobs, makes public-sector service provision more efficient, strengthens communities, promotes equal opportunity, protects the natural environment, enhances national security, and fuels American leadership. On November 3, 2020, NSF issued [Dear Colleague Letter 21-019](#) (Strengthening American Infrastructure), seeking to stimulate fundamental exploratory, potentially transformative human-centered research aimed at strengthening America's infrastructure. It specifically encouraged connections from across science and engineering disciplines, with a special focus on how basic knowledge of human reasoning, decision-making, governance, and social and cultural processes enables efforts to envision, build, and maintain effective infrastructure that improves lives. The Dear Colleague Letter (DCL) invited workshop and Early Concept Grants for Exploratory Research (EAGER) proposals incorporating basic scientific insights about human behavior and social dynamics to better develop, design, build, rehabilitate, and maintain strong and effective American infrastructure.

This solicitation expands on activities encouraged by the DCL by supporting planning grants, research grants, and conferences/workshops to pursue transformative research ideas or approaches that will identify and help build these new areas of research. The aim of this solicitation is to invite novel and potentially transformative research that contributes to the goals of strengthening American infrastructure and building the associated research community.

II. PROGRAM DESCRIPTION

A. Overview

People rely on critical infrastructure to support and enable almost everything they do. Transportation, water, power, information technology, education, healthcare, and emergency response systems all depend on infrastructure. Businesses rely on critical infrastructure to ensure their security, protect their assets, and to communicate with suppliers and customers. Cities, towns, and rural and tribal areas rely on extensive networks of built and civic infrastructure. And scientific progress depends on a substantial research ecosystem infrastructure, including advanced technologies and instrumentation. Strong, effective infrastructure stimulates innovation and job growth, enables discovery and generation of new knowledge. It also provides safety and security, improves quality of life, and facilitates community welfare for all people, for many years into the future. Utilizing a socio-ecological framework in the development of sustainable, resilient and equitable infrastructure can help address many urban and climatic challenges.

Many infrastructure projects entail extensive planning and large initial costs. Those substantial investments are worthwhile to the extent they provide long-term benefit and meet the needs of all people for a range of functions. Building such effective infrastructure requires deep understanding of economic and social dynamics, and the perceptions and choices of many diverse individuals and communities. Whether involving transportation, energy, broadband, water, security, health, education, communication, or other essential services, infrastructure design that puts people and social welfare first, is more likely to gain public support, to function more effectively, to serve more people.

The large costs and potentially large benefits of infrastructure investments mean that it is essential for those who build or maintain infrastructure to understand and incorporate relevant human and social factors in the earliest stages of design. For example, transportation infrastructure to support automated vehicles will require advanced knowledge of economic and social structural influences on people's transportation needs and choices, as well as human perceptual and cognitive responses in a wide range of critical decision-making and task-switching scenarios. Infrastructure developed to expand economic opportunity is likely to be more effective if it builds on recent evidence concerning human social biases, as well as discoveries regarding how social structures affect opportunity across groups. Infrastructure designed to increase the speed and effectiveness of disaster response will work more effectively if its design is informed by the often complex cultural and human trust contingencies and differences in group access to response resources. Healthcare and other public infrastructure that relies on the provision of fast and accurate information will be more effective when built from a knowledge base that includes dynamics of how people process information and how cognitive processing changes under stress. How people interact with their environment is critical to understanding consequences of and design choices for large-scale infrastructure projects such as highways, dams, or levees.

NSF seeks to build research capacity that can address these and many other challenging infrastructure contexts that require a human- and social-centered research approach. This solicitation offers support for planning grants, research grants, and conferences/workshops. The expectation for any proposal type is that projects will bring together experts from one or more of the Social, Behavioral, and Economic (SBE) science disciplines with experts across other scientific and engineering disciplines to support substantial and potentially pathbreaking, fundamental research that will help to strengthen American infrastructure.

Submitted projects must be grounded in user-centered concepts and offer the potential to substantially improve, strengthen and transform the design, development, use, deployment, cost-effectiveness, sustainability, and maintenance of American infrastructure. The social, behavioral, and economic sciences bring substantial expertise and insight to the design and implementation of infrastructure, including basic understanding of barriers to equitable participation, uneven societal impacts, open access to information and data, health disparities, and other human and societal dimensions that interact with the needs for and benefits provided by infrastructure.

Proposals must bring deep expertise in at least one [SBE disciplinary program area](#), and provide details on how such SBE disciplinary expertise will contribute to

strengthening American infrastructure. Proposals must also bring relevant expertise in the focal infrastructure, which is likely to be in one or more research areas represented by the Programs supported by the NSF [Office of Integrated Activities \(OIA\)](#) and/or the other participating NSF Directorates:

- [Biological Sciences \(BIO\)](#)
- [Computer and Information Science and Engineering \(CISE\)](#)
- [Education and Human Resources \(EHR\)](#)
- [Engineering \(ENG\)](#)
- [Geosciences \(GEO\)](#)
- [Mathematical and Physical Sciences \(MPS\)](#)

Proposals must describe how this diverse expertise will be integrated and applied to the specific infrastructure that is the focus of the proposed research. Successful proposals will demonstrate an interdisciplinary and convergent approach beyond that of any single NSF program, division or directorate and will seek to advance both the SBE fields as well as the partnering fields in which they are based.

For the purpose of this solicitation, the focal infrastructure of the proposed research may be of any kind, including physical, cyber, biological, technological, social, economic, or educational. However, *the proposal must identify a specific, focal, and well-defined infrastructure*. Proposals must exhibit and build on a deep understanding of at least one SBE science relevant to the design, development, or sustainability of the focal infrastructure. These sciences may include those of human cognition, perception, information processing, decision-making processes, social and cultural behavior, legal frameworks, governmental structures, and other areas of SBE science supported in the [disciplinary programs of the SBE directorate](#). Proposals are encouraged to include consideration of modeling approaches of both the underlying human processes and the identified infrastructure. Quantitative and predictive models can be used to compare alternative infrastructure approaches, as well as to advance improved dynamical systems. Proposals must also include expertise in the focal infrastructure along with relevant areas of research supported by at least one of the other participating Directorates or Office listed at the top of the solicitation. The long-term aim of proposed research should be on how to better develop, design, build, rehabilitate, and maintain strong and effective American infrastructure, and not solely on the social, behavioral, or economic impacts of infrastructure.

Proposals that include development of new or improved performance metrics that can help stakeholders more effectively and efficiently assess infrastructure usability, cost-effectiveness, sustainability, resilience, or adaptability to changing circumstances are also encouraged.

NSF welcomes and encourages proposals that include efforts to broaden participation of underrepresented groups in STEM (women, minorities, and persons with disabilities) and underrepresented regions in the development and conduct of the research. Proposals from Minority Serving Institutions (MSIs) are highly encouraged, as are opportunities for participation by undergraduate and graduate students and postdoctoral fellows, K-12 students, industry stakeholders, and others. Public-private partnerships can also be proposed.

NSF is open to proposals that focus on any kind of infrastructure, including physical, cyber, biological, technological, social, economic, or educational. However, *the focal infrastructure must be well-specified and well-defined*. Proposals should focus on infrastructure that produces broad societal impact, such as those that support transportation, energy, water, information, computing, national security, buildings, conservation, and commerce. Areas that present the greatest societal challenges are of special interest, including equitable access to and benefit from infrastructure, sustainability, climate impact and disaster mitigation, economic resilience, emerging technologies, and future safety, productivity, and security for all citizens.

B. Proposal Components

In addition to the sections required by the PAPPG, the Project Description for all proposal categories must include the following separate sections, clearly labeled with the headings used below:

Focal Infrastructure

The focal infrastructure of the proposed research may be of any kind, including physical, cyber, biological, technological, social, economic, or educational. The proposal must identify a specific, focal, and well-defined infrastructure. Examples include, but are not limited to, construction engineering, transportation, emergency response, power grids, communication networks and broadband, water and wastewater, education, healthcare, social networks, science collaboratives, biodiversity and farming, and manufacturing. Proposals can also emphasize how quantitative and predictive modeling of a specific infrastructure can be improved by a human-centered approach. Proposals that focus on infrastructure generically or abstractly will be less competitive than those that focus on a specific and well-defined infrastructure.

Integrative Research

Proposals must exhibit and build on a deep understanding of at least one SBE science relevant to the design, development, and sustainability of the focal infrastructure. These sciences may include those of human cognition, perception, information processing, decision-making processes, social and cultural behavior, legal frameworks, governmental structures, and other areas of SBE science supported in the [disciplinary programs of the SBE directorate](#). Proposals must also include expertise in the focal infrastructure and in areas of research supported by at least one of the other participating Directorates or Office listed at the top of this solicitation. The proposal should identify those specific areas, ideally by listing Programs that support disciplinary research in related areas.

Researchers from diverse fields are expected to work convergently, creating shared visions, models, methods, and discoveries. The "Integrative Research" section must describe how knowledge, techniques, and expertise from multiple fields and sectors will create new insights into how to strengthen American infrastructure. This section of the proposal should describe the intellectual and methodological symbiosis within the multidisciplinary team, and how the team will collaborate to illuminate the technological, human, and larger societal dimensions of strengthening American infrastructure. The "Integrative Research" section must identify how expertise of different members of the team will enable cross-discipline and cross-sector integration within the team, and describe how the research will be integrated over the course of the project in support of a [convergent approach](#).

Access and Inclusion

Access and inclusion are high priority goals of this program. All proposals must therefore include an "Access and Inclusion" section that describes how the proposed project will address infrastructure inclusion and equity in a meaningful way. Depending on the project, this section might address deeper understanding of issues leading to unequal access to or impacts of infrastructure, methods for mitigation of inequity, and/or designs of infrastructure that support access and inclusion.

Stakeholder Engagement

The long-term aim of proposed research should be on how infrastructure is designed and deployed, and not solely on the social, behavioral, or economic impacts of infrastructure. All proposals must therefore identify stakeholders involved in the design and deployment of infrastructure, including private sector organizations, government agencies, or community groups. This section of the proposal should address plans for engagement with those relevant stakeholders,

and how those stakeholders might participate in the design, testing and implementation of research-inspired changes to and improvement of infrastructure. In this context, consideration should be given to the ways in which the proposed research supports approaches that advance sustainability and limit negative environmental impacts.

Proposals emphasizing transition-to-practice are also encouraged. Such proposals can include piloting/prototyping of research results as an increment to a standard research proposal or as a primary proposal focus.

C. Proposal Category

This solicitation will support projects in three categories:

1. Planning Proposals

A planning proposal is for support of the initial conceptualization, planning and collaboration activities aimed at formulating new and sound plans for large-scale projects. NSF is especially interested in activities that will catalyze new collaborations that broaden the participation of individuals or organizations underrepresented in NSF award portfolios.

SAI Planning Grants are intended to stimulate research capacity through multidisciplinary team-building and the development of high-impact, fundamental research concepts relating to strengthening American infrastructure. These grants will support a range of planning activities intended to foster a convergent research approach that can effectively integrate SBE disciplinary perspectives with those of areas supported by other NSF Directorates or Office in addressing the design, development and sustainability of a specific focal infrastructure. Planning projects will build collaborations with relevant stakeholders, and seek to identify research gaps, questions, and hypotheses. Activities may include, but are not limited to, travel, multidisciplinary workshops, stakeholder meetings, data collection, preliminary experiments, and pilot studies. At the conclusion of the Planning Grant, researchers should be prepared to pursue a well-defined research agenda responsive to future SAI solicitations. Each award will provide support for a period of up to one year and with a total budget not exceeding \$150,000. Please note that the SAI Planning Grant proposals described in this solicitation are a solicitation-specific project category and are separate and distinct from the type of proposal described in Chapter II.E.1 of the PAPPG. When preparing a SAI Planning Grant proposal in response to this solicitation, the "Research" type of proposal should be selected.

2. Research Proposals

SAI research proposals will integrate SBE disciplinary perspectives with those of areas supported by other NSF Directorates and/or Office in addressing the design, development and sustainability of a specific focal infrastructure. These projects must advance fundamental understanding of how a human-centered approach will support and strengthen American infrastructure. Pursuing a convergent research approach, projects should apply knowledge, techniques, and expertise from multiple fields and sectors to create new frameworks and expand existing frameworks for addressing the research goals. The proposal should describe the symbiosis within the multidisciplinary team, including stakeholders in the infrastructure context, and how the team will collaborate. Proposals should aim to advance understanding of how to improve and strengthen American infrastructure, and not merely the human and societal impacts of infrastructure. Projects will advance the basic science supporting improved infrastructure planning, development, and implementation. They will also include tests or demonstrations of feasibility with infrastructure stakeholders and testbeds.

SAI research awards will provide support for a period of up to three years and with a total overall (three-year) budget not exceeding \$750,000.

3. Conference Proposals

Conference (or workshop) proposals will focus on developing partnerships and collaborations between basic research teams and infrastructure stakeholders. These activities will aim to facilitate the utilization and transition to scale of relevant advances in basic science that contribute human-centered approaches to the design, development and sustainability of a specific focal infrastructure.

Conference proposals must address all the requirements and be prepared in accordance with the guidelines contained in PAPPG Chapter II.E.9, including a listing of other recent meetings on the same or related topics, names of the Chair and members of the organizing committee, information on location and probable dates, a detailed description of how the meeting(s) will be organized and conducted, plans for recruitment of participants, and resources to be made available for the childcare needs of participants. Anticipated deliverables should be described.

The conference proposal option is not intended to support the planning of future research proposals. That aim is accomplished through the planning proposal option.

SAI conference awards will provide support for a period of up to one year with a total budget not exceeding \$50,000.

D. Principal Investigator Meetings

To accelerate the rate of dissemination of ideas among researchers, to build an intellectual research core to address SAI human-centered infrastructure research challenges, and to enable enhanced research collaborations, the SAI program plans to host principal investigator (PI/co-PI) meetings every year with participation from all funded research and planning projects along with other representatives from academia, industry, government, and community organizations. PIs of SAI-funded research and planning projects must participate in these PI/co-PI meetings throughout the duration of the award. For multi-institution projects, investigators from each collaborating institution are expected to participate. A substitute project representative may be designated to attend a PI/co-PI meeting, but only with prior approval from an NSF program manager. As noted in "Budget Preparation Instructions," budgets for all projects must include funding for one or more designated SAI project representatives (PI/co-PI/senior personnel or NSF-approved replacement) to attend each SAI PI/co-PI meeting during the proposed lifetime of the award. This requirement applies both to research and planning awards, but not to conference awards. For budget preparation purposes, PIs should assume these meetings will be held in person in the Washington, DC area.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 35

Up to 10 Planning Grant Awards, up to 15 Research Grant Awards, and up to 10 Conference Awards.

The number of awards is dependent upon the proposals received and the degree to which proposals meet the solicitation goals and NSF merit review criteria.

Anticipated Funding Amount: up to \$10,000,000 pending the availability of funds and quality of proposals.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

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

Who May Serve as PI:

PIs must hold appointments at U.S.-based campuses/offices of eligible organizations (IHEs or Non-profit, non-academic organizations). There are no restrictions, beyond the eligibility outlined in the PAPPG Chapter I.E, on who may serve as co-PIs, Senior Personnel or Consultant (see Categories of Proposers in PAPPG Chapter I.E).

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 individual may appear as PI, co-PI, Senior Personnel, or Consultant on only one proposal submitted in response to this solicitation, totaled across all SAI proposal categories. This eligibility constraint will be strictly enforced. In the event an individual exceeds this limit, the first proposal received prior to the deadline will be accepted and the remainder will be returned without review. This limitation includes proposals submitted by a lead organization, collaborative non-lead proposals, and any subawards included as part of a collaborative proposal involving multiple institutions. No exceptions will be made.

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.D.3 provides additional information on collaborative proposals.

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

Special instructions for submitting to this solicitation

All proposals must be submitted to SBE/SAI; once received, the proposals will be managed by a cross-disciplinary, cross-directorate team of NSF Program Directors.

Please note that the SAI Planning Grant proposals described in this solicitation are a solicitation-specific project category and are separate and distinct from the type of proposal described in Chapter II.E.1 of the PAPPG. When preparing a SAI Planning Grant proposal in response to this solicitation, the "Research" type of proposal should be selected.

Proposal Title:

The title of the proposal **must** begin with "**SAI-P**" to designate a Planning Proposal, "**SAI-R**" to designate a Research Proposal, or "**SAI-C**" to designate a Conference Proposal.

Project Description:

Project Descriptions for Research (**SAI-R**) proposals are limited to 15 pages in length.

Project Descriptions for Planning Grant (**SAI-P**) and Conference (**SAI-C**) proposals are limited to 10 pages in length.

All proposal categories – SAI-R proposals, SAI-P proposals, and SAI-C proposals – must include all sections required by the PAPPG. In addition, the Project Description of all proposal categories *must* contain the following separate sections, clearly labeled with the headings used below, with content as described in Section II.B:

- Focal Infrastructure
- Integrative Research
- Access and Inclusion
- Stakeholder Engagement

In addition, the Project Description should explain why the level of resources requested is appropriate to the project scope. This requirement is especially important for **SAI-R** proposals.

The SAI program welcomes outreach activities, such as those intended to provide undergraduate students and those underrepresented in STEM disciplines with a meaningful research experience. The Project Description should describe these activities, and the Budget should request funds sufficient to carry them out. Post-award supplements to support such activities are not anticipated.

Supplementary Documents:

Supplementary documents are required and listed below by their associated proposal type. They should be uploaded into the Supplementary Documentation Section. No other supplementary materials are allowed. Proposals that do not contain all of their specified supplementary documents will be returned without review. Please note that Research.gov currently can only accept one file for Other Supplementary Documents. If submitting via Research.gov, please combine all documents designated as Other Supplementary Documents into one PDF.

- List of Project Personnel and Partner Institutions (**SAI-R** and **SAI-P** proposals only). Provide current, accurate information for all personnel and institutions 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 Personnel, paid/unpaid Consultants or Collaborators, Subawardees, Postdocs, 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; Postdoc
 4. Raket Ademas; ABC Inc.; Paid Consultant
 5. Mary Wan; Welldone Institution; Unpaid Collaborator
 6. Rimon Greene; ZZZ University; Subawardee
- Management and Coordination Plan (**SAI-R** proposals only; 2-page limit). The SAI program aims for convergence, in which knowledge, techniques, and expertise from multiple fields and sectors create new and expanded frameworks for addressing the research goals. Such integration and impact require extra effort in leadership, regular communication, and cross-training. Therefore, a "Management and Coordination Plan" must be submitted as a Supplementary Document and may not exceed two pages. The document must be labeled "Management and Coordination Plan." The plan must describe specific steps the project team plans to take to achieve the goal of convergent research. This includes specifying what team members are responsible for what parts of the planned project, how the team plans to manage the overall effort, how any unpaid collaborators and industry/non-profit partners (if applicable) will be integrated into the team, and specific activities that will help students involved in the project develop the skills to work on convergent research efforts. The Management and Coordination Plan is limited to two pages.
- Letters of Collaboration (if relevant to project): For all substantial collaborations and engagements (included or not included in the budget) with partner institutions, Letters of Collaboration are strongly encouraged. These should be provided in the Supplementary Documents section of the proposal and follow the format instructions specified in the NSF PAPPG. *Letters of Collaboration cannot contain endorsements or evaluation of the proposed project or any other past projects. This includes any statement about the value of the project to the partner institution.* One acceptable format for a letter of collaboration is as follows:

"If the proposal submitted by Dr. [insert the full name of the Principal Investigator] entitled [insert the proposal title] is selected for funding by NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment or Other Resources section of the proposal."

Proposals with Letters of Collaboration that contain any endorsement or evaluation of the proposed project will be returned without review.

Collaborative activities that are identified in the budget should follow the instructions in the NSF PAPPG. Any substantial collaboration with individuals not included in the budget should also be described in the Facilities, Equipment and Other Resources section of the proposal and documented in a Letter of Collaboration from each collaborator.

- Postdoctoral Researcher Mentoring Plan: Proposals that include funding to support postdoctoral researchers must include a Postdoctoral Researcher Mentoring Plan as supplementary documentation. See Chapter II.C.2.j of the PAPPG for further information about the implementation of this requirement.
- Data Management Plan: All proposals must include a Data Management Plan or explain the absence of the need for such a plan. A Data Management

plan specifies the procedures to be used for keeping, storing, and sharing data with other researchers. Data Management Plans should also include the method for making the data anonymous. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. See Chapter II.C.2.j of the PAPPG for further information about the implementation of this requirement. For Directorate specific guidance on Data Management Plans see <https://www.nsf.gov/bfa/dias/policy/dmp.jsp>.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

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

May 05, 2022

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 the NSF FastLane system for further processing.

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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 *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

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

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in

STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

B. Review and Selection Process

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

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

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

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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.

Special Award Conditions:

For every SAI research and planning award, one or more designated project representatives (PI/co-PI/Senior Personnel or NSF-approved replacement) must attend annual SAI PI meetings throughout the duration of the grant.

Attribution of support: Grantees are required to include appropriate acknowledgement of NSF support under the NSF Strengthening American Infrastructure Program in any publication (including World Wide Web pages) of any material based on or developed under the project, in the following terms:

"This material is based on work supported by the National Science Foundation NSF Strengthening American Infrastructure Program under Grant No. (Grantee enters NSF grant number.)"

Grantees are also required to orally acknowledge NSF support using the language specified above during all news media interviews, including popular media such as radio, television and news magazines.

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:

- Steven Breckler, Program Director, SBE, telephone: (703) 292-7369, email: sbreckle@nsf.gov
- Michael Hout, SBE, telephone: (703) 292-2163, email: mhout@nsf.gov
- Sara Kiesler, SBE, telephone: (703) 292-8643, email: skiesler@nsf.gov
- Jeremy Koster, SBE, telephone: (703) 292-8740, email: jkoster@nsf.gov
- Kristin E. Kuyuk, SBE, telephone: (703) 292-4904, email: kkuyuk@nsf.gov
- Joseph M. Whitmeyer, SBE, telephone: (703) 292-7808, email: jwhitmey@nsf.gov
- Darleen L. Fisher, CISE, telephone: (703) 292-8950, email: dlfisher@nsf.gov
- Michael Ford, EHR, telephone: (703) 292-5153, email: miford@nsf.gov
- Gianluca Cusatis, ENG, telephone: (703) 292-5026, email: gucusatis@nsf.gov
- David A. Sutherland, GEO, telephone: (703) 292-8030, email: dasuther@nsf.gov
- Robert Meulenb, MPS, telephone: (703) 292-7106, email: rmeulenb@nsf.gov
- Randy L. Phelps, OIA, telephone: (703) 292-8040, email: rphelps@nsf.gov
- Amanda A. Simcox, BIO, telephone: (703) 292-8470, email: asimcox@nsf.gov

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

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

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 for instructions regarding preparation of these types of proposals.

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

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

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

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

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

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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