Cyberinfrastructure Technology Acceleration Pathway (CITAP)

PROGRAM SOLICITATION
NSF 23-597

National Science Foundation

Directorate for Computer and Information Science and Engineering
Office of Advanced Cyberinfrastructure

Directorate for Technology, Innovation and Partnerships
Translational Impacts

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

September 06, 2023

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) that is in effect for the relevant due date to which the proposal is being submitted. The NSF PAPPG is regularly revised and it is the responsibility of the proposer to ensure that the proposal meets the requirements specified in this solicitation and the applicable version of the PAPPG. Submitting a proposal prior to a specified deadline does not negate this requirement.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Cyberinfrastructure Technology Acceleration Pathway (CITAP)

Synopsis of Program:

The national cyberinfrastructure (CI) ecosystem is essential to computational- and data-intensive research across all science and engineering (S&E) domains. The CI ecosystem is highly dynamic, driven by rapid advances in a wide range of technologies, increasing volumes of highly heterogeneous data, and escalating demands for CI resources and services by the research community. Innovations in CI are consequently key catalysts for new modes of discovery and play a critical role in ensuring U.S. leadership in science, engineering, economic competitiveness, and national security, consistent with NSF's mission. It is thus imperative that CI innovations become available, in a coordinated and sustainable manner, as part of the NSF-funded advanced CI ecosystem.

The Advanced Cyberinfrastructure Coordination Ecosystem of Support and Services (ACCESS) program provides an array of national-scale CI services to the S&E research community, including integrated coordination of users' requests for computational and data resources; integration of resource providers' systems; deployment of technical support; monitoring of system usage; user training; and communication and outreach to the CI and research communities. The ACCESS program is envisioned to include a process to enable breakthrough CI innovations of recognized value to researchers to be translated into production-quality sustained services that are deployed and made available to the user community from applicable NSF-funded resource providers. Such a process would also include methods to prioritize which innovations to translate to production services and to identify when these services should be taken out of service or replaced.

This CITAP solicitation is focused on the translation of innovative research CI software – such as system software, libraries, application codes, and software enabling data services. NSF seeks proposals that aim to design, test, and subsequently operate a pathway service within the ACCESS program that manages and accelerates the translation of promising research CI software to production-quality services across the NSF advanced CI ecosystem in support of the NSF S&E research community. CITAP proposals are expected to create a new workflow process (represented notionally in Figure 1 below) within the ACCESS program that: (1) identifies novel CI software from diverse sources in a strongly community-informed way; (2) establishes an open and merit-based process for selecting and prioritizing/sequencing which of the identified innovations are of highest and most immediate value to users of the advanced CI ecosystem and can be feasibly translated to production level and made available for use by researchers using ACCESS resources; and (3) establishes an operational process that translates innovations into production services, including creation of partnerships where necessary to address each of the technical challenges and intellectual property (IP) considerations faced when integrating novel CI software within the advanced CI ecosystem.

Examples of translation challenges include (but are not limited to): awareness by potential users who could benefit from the technology; systems engineering and software deployment; an initial launch period of collaborative maintenance; anticipation of user support that will be necessary; engagement of people or possibly organizations needed to sustain and upgrade the software/service in response to changes in technology and/or feedback from users and communities served; and determination of when the relative use or value of the software has decreased to an extent that decommissioning is warranted. The pathway must also be designed to evolve as the types of systems and services that are part of the NSF-funded production advanced CI ecosystem evolve and expand.

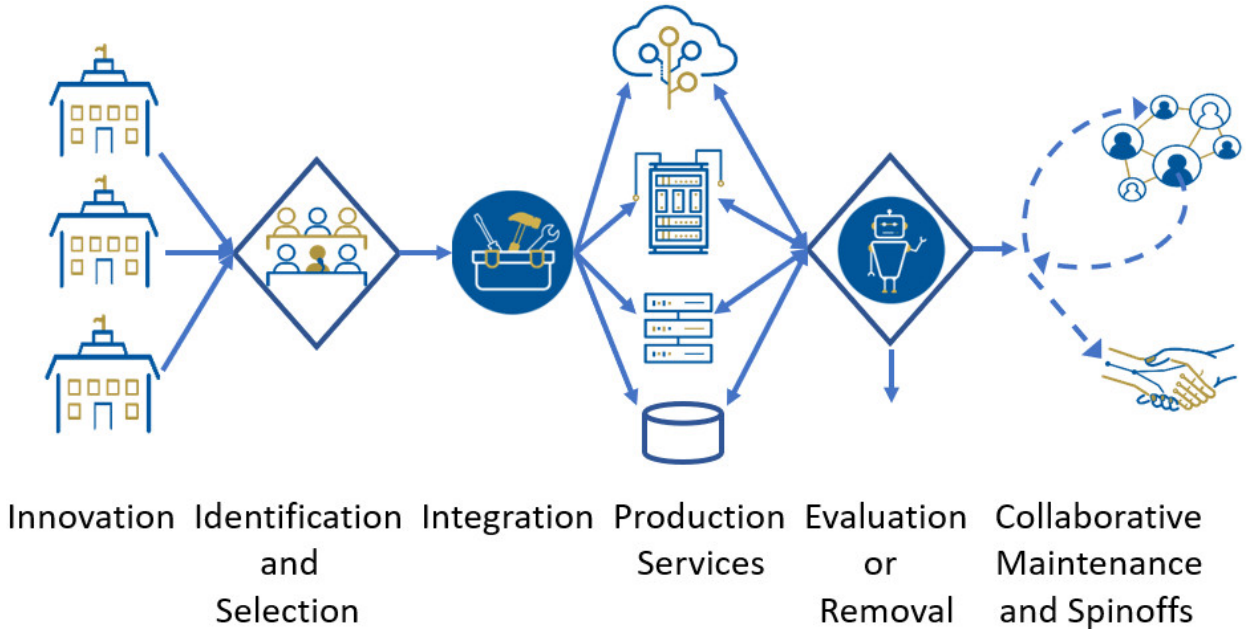

Figure 1. Stepwise translation of innovative software into production services in NSF's advanced CI ecosystem, followed by optional collaborations for upgrades or spinoff enterprises.

CITAP proposals should assume the following three phases of development activities during the award period for the CITAP project: process design; pilot development and testing using CI translation use cases within the ACCESS program; and initial operations at scale. Advancement by the project to each subsequent phase will be based on successful associated milestone reviews that will assess the satisfaction of performance criteria defined for each phase that reflect the interests of key constituents, including S&E users, system administrators, and CI developers. During the initial operations phase, product launches will include a period of collaborative maintenance by the CITAP awardee and developers. Longer-term maintenance should also be planned to sustain and upgrade the technology.

Given the variety of sources of CI research and potential development partners, CITAP proposals are expected to promote the sustainability of the production software via collaboration with organizations or relevant NSF projects. Office of Advanced Cyberinfrastructure (OAC) programs highlighted below are among those that foster development of CI technologies that are candidates for accelerated translation to production. Programs in OAC and in NSF's new Directorate for Technology, Innovations and Partnerships (TIP) support communities that may be suited to sustain or upgrade the production CI technologies. CITAP proposals are welcome to also include or propose to recruit collaborative involvement of constituents beyond NSF programs, such as academic institutions, non-government organizations, industry, and other government agencies.

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.

- Thomas Gulbransen, Program Director, CISE/OAC, telephone: (703) 292-4211, email: tgulbran@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering
- 47.084 --- NSF Technology, Innovation and Partnerships

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1

Anticipated Funding Amount: $10,000,000

A total of $10,000,000 is available for this solicitation for a period of performance of up to five years.

Estimated program budget size/duration are subject to the availability of funds.

There is the potential for a subsequent renewal award for operational services for up to five years commencing at the end of the 5th year of the original award. A possible renewal award focused on full operations would be contingent upon the availability of funds, successful evaluation of CITAP services performed, and NSF merit review recommendation of award for the renewal proposal.

Eligibility Information

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

Organizations are limited to one CITAP proposal per competition. In the event that an organization exceeds this limit, proposals will be accepted based on earliest date and time of proposal submission, i.e., the first proposal will be accepted, and the remainder will be returned without review. No exceptions will be made.

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

An individual may serve as PI or co-PI on only one proposal per competition. In the event that an individual exceeds this limit, proposals will be accepted based on earliest date and time of proposal submission, i.e., the first proposal will be accepted, and the remainder will be returned without review. 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):

  September 06, 2023

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

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

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

CITAP intends to develop and deploy a core service for translation of research software CI to production quality as a new dimension of the ACCESS program across the NSF-funded advanced CI ecosystem, which has become essential to computational- and data-intensive research across all of S&E. The ecosystem is a key catalyst for discovery and innovation, and plays a critical role in ensuring U.S. leadership in S&E, economic competitiveness, and national security, consistent with NSF's mission. NSF, through OAC, has published a vision that calls for the broad availability and innovative use of an agile, integrated, robust, trustworthy, and sustainable CI ecosystem that can drive new thinking and transformative discoveries in all areas of S&E research and education.

OAC's blueprint for national CI coordination services entitled "Transforming Science Through Cyberinfrastructure: Coordination Services" was informed by community input and national initiatives such as the 2019 NSF-funded National Cyberinfrastructure Coordination Service Conference specifically focused on the CI service ecosystem. NSF envisions a fabric of national coordination CI services that can effectively support a broad and diverse set of requirements, users, and usage modes from all areas of S&E research and education. It is also essential that this fabric of services is agile and can evolve and adapt to respond to emerging requirements and emerging technology landscapes.

The NSF-funded advanced CI ecosystem relies on the contributions of CI developers from a diverse array of organizations, such as academic institutions, government agencies, industry, non-profits, and non-governmental organizations. For the ecosystem to incorporate and make available research CI software innovations sustainably, it is imperative that efficient coordination enables each constituent to realize benefits aligned with their interests, such as in the following examples:

- S&E researchers are motivated to specify their requirements and to identify the most effective and efficient methods to support their research.
- CI technology developers are motivated to see their solutions adopted widely and may be eager to assist in adapting the solution where needed.
- CI resource providers are motivated to smoothly incorporate well-documented utilities or services into their platform that add value for their user community, provided they do not disrupt or delay ongoing operations.
- Open-source developers are motivated by broadened availability of the new technology so that additional community members can engage in its improvement or support.
- Commercial developers are also motivated by broadened availability of their brand on a variety of national CI platforms.
- Sponsors of research, e.g., NSF, other agencies, and institutions, may have a variety of motivations to see research technologies become operational services that avoid re-inventions, accelerate time-to-science, and increase reproducibility.

OAC's ACCESS program reaches across the NSF-funded advanced CI ecosystem with three goals central to translating research CI software innovations to production quality:

1. Provide key capabilities, including the discovery of and access to available resources, timely expert technical guidance and focused instruction on effective uses of these CI capabilities, and support for developmental efforts to support the evolving portfolio of NSF-funded S&E;
2. Ensure the effective management, reliable operation, monitoring and measurement, evolution, and overall use of computing resources, and integrate these resources into a coherent, coordinated national ecosystem; and
3. Increase user accessibility, enable collaborative partnerships, simplify the use of CI in dynamic system-of-systems scenarios, support access to relevant data, and enable timely access to novel technologies and solutions.

Formation of partnerships can enable collective efforts that serve many constituents. Partnerships can help the ACCESS program to translate research CI software innovations centered on S&E domains or geographic regions with common interests and can provide synergistic relationships vital to the development and sustainable provisioning of new technologies. CITAP proposals are expected to describe how such partnerships will be promoted and designed to persist beyond the award funding. Acceleration of technology translation may incorporate collaboration with a variety of NSF projects, academic institutions, non-governmental organizations (NGOs), and or commercial enterprises. Expansion of the participation of women and individuals from groups traditionally underserved in innovation, technology translation, and entrepreneurship is especially encouraged. CITAP proposals are not required to pursue or achieve commercialization outcomes.

The ACCESS program is expected to be the foundation of the CITAP processes. The awardee will leverage ACCESS services, for example, as one input to understanding user requirements for CI software. ACCESS has also established road maps helpful to integrate with HPC resource providers. As innovations reach production status, they will be added to the ACCESS database of available services.

Novel research CI software deserving translation from R&D to production may originate from a range of OAC programs, such as (but not limited to) Cyberinfrastructure for Sustained Scientific Innovation (CSSI), OAC Core Research, Cybersecurity Innovation for Cyberinfrastructure (CICI), Cyberinfrastructure for Emerging Science and Engineering Research (CESER), and Campus Cyberinfrastructure (CC*) programs, and their precursors. Technologies that successfully traverse the CITAP process are expected to be available to the NSF-funded S&E community as production capabilities, for example through integration into the CI ecosystem as part of the High Performance Computing (HPC) or High Throughput Computing (HTC) resources/services funded by OAC, including Advanced Computing Systems & Services (ACSS), the Partnership to Advance Throughput Computing (PATh) facilities, or the Major Research Instrumentation Program (MRI). Production capabilities may also be distributable as downloadable packages.

In addition to OAC programs that CITAP may use to identify candidate research CI software warranting production status, NSF's TIP Directorate has multiple programs that may be sources of valued CI innovations as they cultivate organizations that accelerate technology translation via open science or commercialization. TIP's Partnerships for Innovation (PFI) program helps researchers translate basic research into technologies and spurs university spinoff companies. The PFI program offers researchers a technology testbed to gain market insights, launch a commercial application, or facilitate industry adoption. Lessons learned from PFI's investment in translational research or technology development partnerships that transition ideas from lab to marketplace may be informative to the design and implementation of CITAP operational processes. TIP's Regional Innovation Engines program ("NSF Engines") harness the nation's science and technology research and development enterprise and regional-level resources to catalyze robust partnerships rooted in scientific and technological innovation to positively impact the economy within a geographic region, address societal challenges, and advance national competitiveness. Likewise, TIP's Pathways to Enable Open-Source Ecosystems (POSE) program harnesses the power of open-source development for the creation of new organizations that advance technology solutions to solve problems of national and societal importance. Translation of new open-source technologies can benefit significantly from organizational infrastructure to widen their adoption and cultivate self-sustaining maintenance and upgrades through a distributed community of developers and a broad base of users across academia, industry, and government.

CITAP proposals are invited to consider whether collaboration with TIP programs could enhance sustainability of the novel research CI software after the CITAP processes reach production operations.

II. PROGRAM DESCRIPTION

Over the last decade, OAC investments in CI research, CI resource provisioning, and community development have created a portfolio of programs that produce innovative solutions to advance S&E research and education across the nation. The NSF-funded advanced CI ecosystem, coordinated by the ACCESS program, comprises a variety of advanced computing high-performance and high-throughput computational systems, networks, and data resources that can benefit from integration of additional research CI innovations.

A clearer process, or "pathway," is needed as part of the ACCESS program to identify and translate research CI software innovations into production-quality services that will achieve OAC's vision of an agile CI ecosystem of broadly available, robust, and trustworthy technology. CITAP proposals should address all pertinent technical challenges to reaching production-quality readiness, as well as the organizational challenges associated with potentially distributing, operating and upgrading these services in a sustainable manner. After the translation process becomes operational, the new pathway may also align with TIP's programmatic priorities in technology development partnerships, open science communities, and/or commercial enterprises.

The eventual CITAP project will be expected to maintain well-defined interfaces with the CI research and developer community as well as with HPC host systems to maximize their potential impact on S&E, and to ensure nondisruptive translation of CI innovations to production. The CITAP awardee must work cooperatively with host systems, such as (but not limited to) service providers funded by the NSF ACSS and ACCESS programs, as appropriate, to maintain a successfully coordinated ecosystem.

CITAP awardees should consider how the integration of the innovative CI projects into production can be responsive to opportunities for improved efficiencies and performance in the operations of the CI ecosystem. Such services will serve as a bridge between the "push" from new innovations from the S&E research community and the "pull" from needs identified by CI resource providers, NSF technology development partners such as other agencies and NGOs, and the S&E research community.

CITAP proposals are expected to demonstrate expertise in process design. Proposals should demonstrate capability to follow established data, software, and systems engineering methods. Proposals are invited to develop innovative mechanisms, and to foster governance partnerships for the nondisruptive and sustained integration of software services into the NSF-funded advanced computing (including HPC/HTC) production systems, or as downloadable packages.

NSF anticipates maturation and evolution of the pathway to identify and translate innovative CI capabilities into production operations. CITAP proposals should include a process design phase for year 1, followed by a pilot phase for years 2 and 3. Results from the pilot phase will inform a performance review to determine the merit and likelihood of success if deployed in an Initial Operations phase for years 4 and 5, with high and broad availability to the S&E research community during the project award period. Contingent on a successful review of the 4th year review, the operational awardee may be invited by NSF to submit a renewal proposal for operational services for up to five years commencing at the end of the 5th year of the original award. A possible renewal award focused on full operations would be contingent upon the availability of funds, successful evaluation of CITAP services performed, and NSF merit review recommendation of award for the renewal proposal.

CITAP proposals must include the following three phases. Plans for additional activities *relevant to CITAP goals* are also welcome.

Design Phase

Design of the CI technology acceleration pathway should define, at a minimum, a workflow to identify, openly prioritize, and handle the breadth of potential research CI software technologies, the pathway constituents who will influence its design, programs and partners (including host systems and possible industrial partners), applicable stages of technology translation from research to production status, the organizational model of governance, indicators of progress/success, selection of use cases representative of S&E researchers' needs, integration and distribution targets, and processes to evaluate the technology acceleration pathway. Pathway design should address custodial ownership, and IP considerations if raised by constituents, for each given solution candidate once it graduates into production, including how long the candidate will be sustained and processes to retire them, engagement mechanisms with

both the solution developers, partners, and CI resource provider hosts, and ongoing metrics to gauge usefulness to S&E research and education communities. The pathway design should describe applicable indicators of progress toward sustainability of the research CI innovation.

Pilot Development & Testing Phase

During the Pilot Development and Testing phase, proposers should develop, document, and begin executing technology acceleration pathway processes for representative use cases that determine (in an open manner using established criteria and metrics, and with community inputs) which innovative technologies to move along toward production, which systems or platforms are suitable for their deployment, and reasonable timeframes to be integrated sustainably into the production systems. When applicable, mitigation plans and alternative approaches should be proposed. Governance agreements should be established and evaluated among contributing partners where applicable, including industrial partners, non-governmental organizations, or others where applicable. The proposed methods should carefully consider the time spent in technology cultivation, development, users' requirements, operations and maintenance (O&M), and integration compatibility assessment. For example, technologies intended for deployment on advanced computing resources coordinated by the ACCESS program should address the requisite conditions necessary to fulfill the Integration Roadmaps of the targeted resources. Each element of the technology acceleration pathway should be tested, refined, and documented. As the technology acceleration pathway pilot anticipates performance reviews toward graduation to the initial operational phase, it should anticipate economy-of-scale aspects to allow for less time and budget necessary for each innovative technology to be accelerated. Proposals should describe the pathway's anticipated capacity to concurrently translate new technologies and provide collaborative maintenance during its launch periods.

Initial Operational Phase

The Initial Operational phase will, for a period of at least 2 years, implement the proposed governance structure, deploy processes for technology selection, translate research CI software innovations to production-ready status, integrate them into host systems and or make them available as downloadable packages, collaboratively maintain them during launch periods, promote longer-term partnerships to sustain and upgrade where applicable, and or retire technologies no longer in demand, across the advanced CI ecosystem at NSF-funded programs and CI resource providers. During the Initial Operations phase, the awardee will report on the progress of each CI innovation being addressed based on its respective technology readiness level. Initial Operations will include monitoring key performance indicators that reflect feedback from all involved constituent types, e.g., S&E researchers, developers, and HPC host system administrators.

CITAP PIs will be expected to leverage collaborative interactions with those who govern the programs or systems where technologies will be deployed. Service to the ACCESS program will include participation on the Executive Council for governance. Constituent interactions can be facilitated via ACCESS' Resource Provider Forum, External Advisory Board, Researcher Advisory Committee, and or engagement with ACCESS constituent communications.

III. AWARD INFORMATION

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1

Anticipated Funding Amount: $10,000,000

A total of $10,000,000 is available for this solicitation for a period of performance of up to five years.

Estimated program budget size/duration are subject to the availability of funds.

There is the potential for a subsequent renewal award for operational services for up to five years commencing at the end of the 5th year of the original award. A possible renewal award focused on full operations would be contingent upon the availability of funds, successful evaluation of CITAP services performed, and NSF merit review recommendation of award for the renewal proposal.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

Organizations are limited to one CITAP proposal per competition. In the event that an organization exceeds this limit, proposals will be accepted based on earliest date and time of proposal submission, i.e., the first proposal will be accepted, and the remainder will be returned without review. No exceptions will be made.

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

An individual may serve as PI or co-PI on only one proposal per competition. In the event that an individual exceeds this limit, proposals will be accepted based on earliest date and time of proposal submission, i.e., the first proposal will be accepted, and the remainder will be returned without review. No exceptions will be made.

Additional Eligibility Info:

These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently. In the event that an individual exceeds this limit, proposals received within the limit will be accepted based on the earliest date and time of proposal submission (i.e., the first proposal received will be accepted and the remainder will be returned without review). **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.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.

Prospective principal investigators (PIs) are strongly encouraged to contact the Cognizant Program Officers in CISE/OAC to ascertain whether the focus and budget of their proposed activities are appropriate for this solicitation. Such consultations should be completed at least one month in advance of the submission deadline. PIs should include the names of the Cognizant Program Officers consulted in a Single Copy Document in the proposal.

Proposal Titles: The proposal title should begin with the acronym CITAP, followed by a colon, then the title.

Project Summary: (1-page limit): The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity. The overview includes a summary description of the project, including the need for the activity and its short- and long-term goals for translating software innovations into production-quality services within the NSF-funded advanced cyberinfrastructure ecosystem. The overview should also include 6-7 keywords, e.g. cyberinfrastructure, technology translation, systems engineering. The Project Summary should be written in a manner that will be understandable to a scientifically literate lay reader.

Project Description: (15-page limit): The project description should explicitly address the phases outlined in the Program Description section and the following additional items with emphasis suitable to the proposed work and goal(s) of the solicitation (note that this information will also be employed as additional solicitation-specific review criteria; see Section VI.A. for details):

- Engagement of appropriate constituents including ACCESS program awardees, S&E research communities, technology development partners, and host systems. Please note that Letters of Collaboration from ACCESS program awardees are not necessary and should not be requested.
- Understanding of the objectives and tasks/activities with specific milestones that will need to be fulfilled to close the knowledge gaps and technical barriers so that the proof-of-concept, prototype, or novel technology can be efficiently translated into a production-quality solution.
- Ability to include the participation of the full spectrum of diverse talent in STEM and broaden the geographic extent of participation in the CI ecosystem.
- Effectiveness of assessment methods and metrics to demonstrate progression, or corrective actions, for each technology along the acceleration pathway.
- Ability for the pathway to address long-term sustainability of the technology.
- Demonstration of the pathway's scalability.
- Experience with technology development partnerships.

Please note that, per guidance in the PAPPG, the Project Description must contain a separate section labeled "Broader Impacts."

Supplementary Documents:

In the Supplementary Documents Section, upload the following:

1. A list of Project Personnel and Partner Organizations (Note: In collaborative proposals, the lead organization should provide this information for all participants): Provide current, accurate information for all personnel and organizations involved in the project. NSF staff will use this information in the merit review process to manage conflicts of interest. The list should 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; Postdoctoral Researcher

4. Rakel Ademas; ABC Inc.; Paid Consultant
5. Maria Wan; Welldone Institution; Unpaid Collaborator
6. Rimon Greene; ZZZ University; Subawardee

2. Management and Coordination Plan (2 pages): Each proposal must contain a clearly-labeled Management and Coordination Plan that includes: 1) the specific roles of the PI, co-PIs, other Senior Personnel and paid consultants at all organizations involved; 2) how the project will be managed across organizations and disciplines; 3) identification of the specific coordination mechanisms; and 4) pointers to the budget line items that support these management and coordination mechanisms.
3. Data Management Plan (required): Proposals must include a supplementary document of no more than two pages labeled "Data Management Plan." This supplementary document should describe how the proposal will conform to NSF policy on the dissemination and sharing of research results. See Chapter II.D.2.i of the PAPPG for full policy implementation. For additional information on the Dissemination and Sharing of Research Results, see: https://www.nsf.gov/bfa/dias/policy/dmp.jsp. For specific guidance for Data Management Plans submitted to the Directorate for Computer and Information Science and Engineering (CISE) see: https://www.nsf.gov/cise/cise_dmp.jsp.
4. CI Professional Mentoring and/or Professional Development Plan (1 page, *if applicable*): Any proposal that requests funding to support a CI professional must upload a supplementary document titled "CI Professional Mentoring and/or Professional Development Plan." CI Professionals are the professional staff who develop, deploy, manage, and support effective use of CI (e.g., research software engineers, programmers, IT professionals, data scientists, system administrators, CI facilitators, etc.) The document must describe the mentoring and professional development activities that will be provided for such individuals. In no more than one page, the planned activities must be described that are targeted specifically for CI professionals supported by the project, regardless of whether they reside at the submitting organization, any sub-recipient organization, or at any organization participating in a simultaneously submitted collaborative proposal. Proposers are advised that the professional development and mentoring plan must not be used to circumvent the Project Description limitation. The professional development and mentoring activities provided to CI professionals supported on the project will be evaluated under the Broader Impacts review criterion. Examples of professional development and mentoring activities include, but are not limited to: career counseling; training in preparation of and opportunities to prepare grant proposals, publications and presentations; guidance on finding opportunities for professional training and career advancement: guidance on effectively collaborating with researchers and other professionals from diverse backgrounds and across multiple S&E disciplines; and providing information on and training in responsible professional practices.
5. Letters of Collaboration for Cooperative Research Agreement: Collaborators are individuals or entities that work with the PI and her/his team to provide additional value to the project and may be paid or unpaid. Whether or not the collaborator is included in the budget, a letter of collaboration from each named participating entity should be provided at the time of submission of the proposal. All letters submitted must appear on the entity's letterhead and be signed by the appropriate representative of the entity/organization. Letters of collaboration should not contain endorsements or evaluation of the proposed projects. The proposal Project Description section should detail the nature of the services or resources to be provided pursuant to each Letter of Collaboration.

   It is the responsibility of the submitting organization to discuss the appropriate intellectual property policies, including patent disclosures and filings, with research partners. Pertinent information can be presented in the data management plan. NSF is not responsible for the type of agreement reached between grantees and industrial/research partners. If applicable, include a statement that an executed cooperative research agreement (CRA) will be provided as a condition for recommendation of the proposal for award.

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):

  September 06, 2023

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.

Additional Solicitation Specific Review Criteria

Reviewers of CITAP proposals will follow NSF's complete merit review process as described in the PAPPG. Additionally, they will be asked to consider the following criteria specific to the CITAP solicitation.

- Engagement of appropriate constituents including ACCESS program awardees, S&E research communities, technology development partners, and host systems. Please note that Letters of Collaboration from ACCESS program awardees are not necessary and should not be requested.
- Understanding of the objectives and tasks/activities with specific milestones that will need to be fulfilled to close the knowledge gaps and technical barriers so that the proof-of-concept, prototype, or novel technology can be efficiently translated into a production-quality solution.
- Ability to include the participation of the full spectrum of diverse talent in STEM and broaden the geographic extent of participation in the CI ecosystem.
- Effectiveness of assessment methods and metrics to demonstrate progression, or corrective actions, for each technology along the acceleration pathway.
- Ability for the pathway to address long-term sustainability of the technology.
- Demonstration of the pathway's scalability.
- Experience with technology development partnerships.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by 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:

TBD - Programmatic Terms and Conditions

TBD - Financial and Administrative Terms and Conditions

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:

- Thomas Gulbransen, Program Director, CISE/OAC, telephone: (703) 292-4211, email: tgulbran@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** (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:

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