

NSF 24-583: Advanced Computing Systems & Services: Adapting to the Rapid Evolution of Science and Engineering Research 2.0

Program Solicitation

Document Information

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National Science Foundation

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

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

October 29, 2024

Category I Submissions

June 24, 2025

Category II Submissions



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Important Information And Revision Notes

This solicitation continues the Advanced Computing Systems and Services (ACSS) program's emphasis on funding systems and services providing cyberinfrastructure (CI) for the Nation's science and engineering (S&E) research community.

Proposers are reminded that proposed capabilities and/or services must conform to the performance requirements when preparing Resource Reliability and Usability as required within the Project Description section of the proposal.


Proposers are reminded that user support and operating costs MUST NOT be included in the budget section of the proposal. An analysis of annual operating costs of the resource for the duration of the award must be presented in (and only in) the Concept of Operations as required within the Project Description section of the proposal.

Solicitation revisions are summarized as follows:

Either only Category I or only Category II proposals will be considered during each respective solicitation deadline on a rotating schedule as described in the full proposal deadline(s) section.

The solicitation Introduction, Program Description, and Proposal Preparation and Submission Instructions sections have been updated to more accurately reflect themes of interest for community consideration.

The solicitation term "ACSS 2.0 Program" is used to identify the current program. The award amount for Category I has been updated to be between \$10,000,000 and \$20,000,000 per award for up to five years. User support and operating costs have been updated to be up to 15% of the total resource acquisition cost per year for each deployed Category I or Category II system/service for up to five years; projected annual operating costs above 15% of the total resource acquisition cost must be discussed with a cognizant Program Officer prior to submission and will be considered in relation to the justified need.

The solicitation term "Resource Provider" (RP) reflects the language described by the ["Advanced Cyberinfrastructure Coordination Ecosystem: Services & Support \(ACCESS\)" suite of services](#) .

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:


Advanced Computing Systems & Services: Adapting to the Rapid Evolution of Science and Engineering Research 2.0

Synopsis of Program:

The intent of this solicitation is to request proposals from organizations who are willing to serve as resource providers within the NSF *Advanced Computing Systems and Services (ACSS)* program. Resource providers would (1) provide advanced cyberinfrastructure (CI) resources in production operations to support the full range of computation, data-analysis, and AI research across all of science and engineering (S&E), and (2) enable democratized and equitable access to the proposed resources. The current solicitation is intended to complement previous NSF investments in advanced computational infrastructure by provisioning resources, broadly defined in this solicitation to include systems and services, in two categories:

- Category I, Capacity Resources: production computational resources maximizing the capacity provided to support the broad range of computation, data analytics and AI needs in S&E research; and
- Category II, Innovative Prototypes/Testbeds: innovative forward-looking capabilities deploying novel technologies, architectures, usage modes, etc., and exploring new target applications, methods, and paradigms.

Resource Providers supported via this solicitation will be incorporated into NSF's ACSS 2.0 program portfolio. This program complements investments in leadership-class computing and funds a federation of nationally available advanced computing resources that are technically diverse and intended to enable discoveries at a computational scale beyond the research of individual or regional academic institutions.

NSF anticipates that at least 90% of the provisioned resource will be available to the S&E community through an open peer-reviewed national allocation process and have resource users be supported by community and other support services. Such allocation and support services are expected to be coordinated through the NSF-funded [Advanced Cyberinfrastructure Coordination Ecosystem: Services & Support \(ACCESS\)](#) , [the National AI Research Resource](#), or an NSF-approved alternative as may emerge.

Provisioning novel, diverse computational resources nationally at scale will require capability and capacity to support researchers who need assistance to use these resources. User support may be provided via various means, e.g., training sessions, documentation, direct engagement in response to tickets created via the ACCESS program, or integration of novel, NSF-funded software tools.

The ACSS 2.0 Program seeks broad representation of PIs across the full spectrum of diverse community talent (including the participation of groups that have traditionally been underrepresented in the cyberinfrastructure community) and institutions (including those that have not historically provided nationally allocatable cyberinfrastructure) in both the community of resource recipients and resources users to continue growing the scale and diversity of the S&E community. Submission from or partnership with EPSCoR institutions and institutions that have not previously received ACSS awards is encouraged.

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.

- Robert Chadduck, Program Director, CISE/OAC, telephone: (703) 292-8970, email: rchadduc@nsf.gov
- Andrey Kanaev, Program Director, CISE/OAC, telephone: (703) 292-2841, email: akanaev@nsf.gov
- Alejandro Suarez, Program Director, CISE/OAC, telephone: (703) 292-7092, email: alsuarez@nsf.gov
- Sharon Geva, telephone: (703) 292-7058, email: sgeva@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1 to 3

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

During submission cycles accepting Category I proposals, no Category II proposals will be considered.

Category I awards shall be between \$10,000,000 and \$20,000,000 for up to 5 years of duration.

During submission cycles accepting Category II proposals, no Category I proposals will be considered.

Category II awards shall not exceed a total of \$5,000,000 and 5 years of duration.

Anticipated Funding Amount: \$60,000,000

Estimated program budget and number of awards are subject to the availability of funds.

It is anticipated that, during submission cycles accepting Category I proposals, 1-3 Category I awards will be made at between \$10,000,000 and \$20,000,000 per award for up to five years. During submission cycles accepting Category II proposals, 1-4 Category II awards will be made at up to \$5,000,000 per award for up to five years. User support and operating costs are expected to be up to 15% of the total resource acquisition cost per year for each deployed Category I or Category II system/service for up to five years; projected annual operating costs above 15% of the total resource acquisition cost must be discussed with a cognizant Program Officer prior to submission and will be considered in relation to the justified need. User support and operating costs will be funded via consideration of a supplement to the awarded cooperative agreement or other proposal mechanism. Proposals should provide an analysis of the projected annual operating costs of the proposed resource for a period of up to five years.

In Category I or Category II, there is a possibility of a renewal award contingent upon availability of funds and the successful evaluation of the resource provider's performance as well as NSF merit review of the renewal proposal. During annual reviews, the Category I and Category II Resource Provider's achievements and future plans will be comprehensively evaluated according to the criteria defined in the initial award, associated metrics, and other relevant criteria. Contingent on a successful third-year review, a Category I or Category II Resource Provider may be invited by NSF to submit a renewal proposal in the same Category as the original award, for up to five years commencing at the beginning of the fifth year of the original award.

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 laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

An organization may submit only one proposal per each competition specified in this solicitation but may be a subawardee on other proposals responding to this solicitation. The restriction to no more than one submitted proposal as lead institution is to help ensure that there is appropriate institutional commitment necessary for responsible oversight, by the potential recipient institution, of a national resource.

Collaborative projects may only be submitted as a single proposal in which a single award is being requested (PAPPG Chapter II.E.3.a). The involvement of partner organizations should be supported through subawards administered by the submitting organization.

These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently. In the event that an organization exceeds this limit, the proposal 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.**

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

An individual may be the PI or co-PI on no more than one proposal per each competition specified in this solicitation. There is no limit on the number of proposals with which an individual may be associated in other capacities, such as senior/key personnel.

These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently. In the event that an individual exceeds this limit, the proposal 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.**

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. submitting organization's local time):

October 29, 2024

Category I Submissions

June 24, 2025

Category II Submissions

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:

Standard NSF award conditions apply.

Reporting Requirements:

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

I. Introduction

Today's research discoveries at the confluence of theoretical, experimental, and computational S&E are enabled by the continuing availability of an ecosystem of advanced computational resources. For several decades, NSF has effectively supported the broad availability and innovative use of a diverse set of computational resources to accelerate fundamental advances in S&E. These investments have spanned discipline-specific instruments and facilities; computational systems and services of varying capabilities and architectures optimized for different applications; virtual organizations for allocating resources and interfacing with users; human expertise in using, developing, deploying and operating resources; and the network backbone that connects and provides access to these resources.

With wide adoption of new modalities of scientific and engineering discovery, the demand for advanced computing capabilities and services has increased significantly over the past two decades. With the slowing of Moore's Law, advanced computing systems have incorporated more energy-efficient and parallel architectures, along with faster interconnects, and new memory and storage paradigms to enable continued performance growth. This in turn has driven the S&E research community to explore new programming models, algorithms and methods in the pursuit of transformative discoveries across all S&E.

NSF supports several computational resources enabled a broad range of S&E research applications. Many such resources, support for user communities, and integration of novel technologies are coordinated through the NSF-funded ["Advanced Computing Coordination Ecosystem: Services and Support"](#) suite of services.

NSF's ongoing planning for possible future federated cyberinfrastructure resources is guided by long-term visions, such as the [National Artificial Intelligence Research Resource \(NAIRR\)](#) and other elements towards a [Future Advanced Computing Ecosystem](#). NSF's planning is also driven by advanced computing system usage and performance data from [ACCESS monitoring and measurement utilities](#). Furthermore, NSF recognizes the need to support the growing scale and diversity of the S&E community and to democratize access to computational and data resources for all communities, including underrepresented communities, as informed by the recent NSF-funded study "[The missing millions: Democratizing computation and data to bridge digital divides and increase access to science for underrepresented communities](#)", the "[Geography of Innovation](#)" (as described in the National Science Board's [Vision 2030 report](#)), and consistent with the mission of NSF's [Established Program to Stimulate Competitive Research \(EPSCoR\)](#) in targeted jurisdictions (state, territory or commonwealth).

In the following sections, the term "resource" is used broadly to include systems and/or services.

II. Program Description

The intent of this solicitation is to request proposals from organizations willing to serve as Resource Providers (RPs) within the NSF ACSS program to provide advanced CI capabilities and/or services in production operation to support the full range of computational- and data-intensive research across all of S&E.

To increase the Nation's capacity for transformative S&E discoveries, NSF is interested in continuing to diversify and evolve its portfolio to take advantage of new technologies and services that include capabilities addressing emerging computational- and data-intensive S&E research topics, workflows, and communities, while expanding opportunities for participation by a broader range of potential RPs.

This competition emphasizes the provisioning of an ecosystem of advanced computational resources and services that is responsive to the dramatic increase in the number and nature of applications using NSF-funded resources. Proposals are requested for advanced computing systems and services that will acquire and deploy capabilities and services, including composable services, to address the increase in demand for computation, data analytics and AI resources in the S&E research community, as well as explore novel paradigms for enabling transformative S&E discoveries.

An important aspect of the current solicitation is that funded projects must provide CI capabilities and/or services that demonstrate high degrees of stability and usability during the period of production operations available to the broad S&E community. NSF strongly urges the community to consider expanding the range of possibilities in enabling S&E communities to leverage the power of computation for transformative research, and to think broadly about the nature and composition of the CI ecosystem including next-generation energy use and operational practices for reducing carbon output of research computing. Other considerations may include, but are not limited to, ease of access to proposed resources by new S&E communities; new capabilities that will open up new methods and paradigms for S&E discoveries; federated approaches with opportunities for leveraging the increasing availability and capabilities at the network edge; and composable services provisioning virtualized computing infrastructure and commercial cloud services.


The current solicitation is intended to complement previous NSF investments in advanced computational infrastructure through provisioning resources in two categories as described below.

Category I – Capacity Resources

Resources proposed in this category are intended to be operational deployments of production computational resources that will provide maximum capacity and throughput to support the broad range of computation, data analytics and AI needs in S&E research. The deployments are expected to adhere to a vision of an advanced computing ecosystem as a federated set of resources and services that are heterogeneous in architecture, resource type, and usage mode to collectively meet the Nation's foundational needs for world-leading computing capabilities.

The proposed resource must be clearly motivated by the current and future demand for simulation, data analysis, and AI use cases for the broad disciplinary and geographically diverse S&E research communities.

Proposers are encouraged to explore novel models for future dynamic national cyberinfrastructure federation including in compute resources, software, data, technical expertise, stakeholders, on-demand allocations, and resource provisioning mechanisms. The latter mechanisms can govern regional and/or campus supported resources, and/or commercial cloud services, enabling comprehensive and effective science-based response to a potential future national and/or international urgent need; or be available to fuel AI research and developments enabling advances towards safe, secure, and trustworthy development and use of artificial intelligence, as elements opening opportunities for the next breakthroughs in science, engineering, and technology. Competitive proposals in Category I must address the following themes in the Project Description (to be discussed in a specific subsection as described in Section V.A. Proposal Preparation Instructions, if noted):

- A clear plan for provisioning a resource that addresses the current and future demand for computational, data analytics, and AI use cases in the broad S&E computational research community;
- A description of how the resource will support S&E research communities that require a national-scale, on-demand, compute, data-analytics and AI resource with a flexible and accessible software environment
- A comprehensive set of system-level performance and reliability metrics, including minimization of carbon output and energy usage, that will be used by NSF for acceptance of the resource or service (to be discussed in the S&E Application Performance and Resource Reliability and Usability sections);
- A detailed risk-mitigated deployment plan to ensure that the proposed resource will be in production operations and available for allocation to the open S&E research community no later than 12 months from the time of award (to be discussed in the Project Management and Risk Mitigation section);
- A clear concept of operations for the project duration with a clear set of operational performance monitoring and science impact metrics to ensure the resource will be an asset for the nation's S&E research community, as informed by [the ACCESS Program's Integration Roadmaps for new resource providers](#)  (to be discussed in the Concept of Operations section);
- A persuasive articulation as to how the resource will support less traditional and/or underrepresented computational S&E communities if appropriate and how models of engagement with campus-supported CI will be explored (to be discussed in the Broader Impacts section).

Relevant parameters contributing to the comprehensive technical description of the proposed system may vary with the nature of the resource. However, organization of the proposal must closely adhere to the guidelines provided in section V.A. Proposal Preparation Instructions.


Category II – Innovative Prototypes/Testbeds

Resources proposed in this category will be initially deployed as a prototype/testbed supporting S&E research through delivery of novel forward-looking capabilities and services. Resources proposed in this category can represent the deployment of new technologies, system architectures, or usage modalities at scale, with plans for developing a national S&E user community that will benefit from the proposed capabilities. Proposed resources could encompass a broad range from enabling of advancements in traditional computing architectures to novel computing paradigms. The former could include novel processor architectures supporting artificial intelligence applications or integration of distributed systems leveraging edge devices; domain-specific architectures; reconfigurable and/or software defined systems; systems designed for streaming data and/or real-time processing, etc. The latter could apply aspects of neural and broader levels of non-neural biological organization architectures or implement collective properties of quantum states. Proposers are

further encouraged to potentially explore novel facility scale electric power infrastructure, including models, leading to significant efficiencies in compute center and edge scale power utilization. Additionally, the solicitation incents efforts to explore and assess comprehensive and effective future options for science-based responses to a potential future national and/or international urgent need, as well as towards opportunities for future AI-enabled breakthroughs in science, engineering, and technology.

Proposers must clearly define the target classes of S&E applications that will be enabled, as well as a clear plan for ensuring the widespread adoptions by these classes of applications on the proposed capabilities and/or services. While the resources in this category may initially include prototypes/experimental testbeds, proposers are expected to present a clear near-term plan for transitioning to high-availability production services broadly available and allocatable to the S&E community through open peer-reviewed processes during the final 24 months of the project award period. It is also expected that the initially deployed prototype/testbed will include active engagements with S&E researchers, and these engagements will be reviewed by NSF in its evaluation of the system. Clear science impact metrics for measuring the performance of the proposed system are required.

Competitive proposals in Category II must address the following themes in the Project Description (to be discussed in a specific subsection as described in Section V.A. Proposal Preparation Instructions, if noted):

- A clear plan for provisioning innovative computational and data analysis capabilities or services that will enable new methods and paradigms in support of transformational S&E discoveries;
- A compelling description of how the proposed capabilities or services will address future demand for computation and data analytics capabilities in S&E research;
- A persuasive set of S&E use cases, including quantitative analysis through benchmarks, that clearly motivate how the resource will expand the range of S&E applications that can be currently tackled using existing ACSS resources;
- A clearly defined set of target S&E application classes that will be enabled, as well as a clear plan for ensuring the widespread adoption by these classes of applications on the proposed capabilities and/or services;
- A comprehensive set of system-level performance and reliability metrics that will be used by NSF for acceptance of the resource or service (to be discussed in the S&E Application Performance and Resource Reliability and Usability sections);
- A detailed risk-mitigated deployment plan to ensure that the proposed resource will evolve to high-availability production services broadly available for allocation to the open S&E research community in the final 24 months of the award period (to be discussed in the Project Management and Risk Mitigation section);
- A clear concept of operations for the project duration, with a detailed set of engagement activities with the S&E research community, to optimize the use of the resource, facilitate application and user transition during the initially-deployed prototype/testbed system phase, and ensure that the resource evolves to a high-availability production utility for a national community of S&E users (see [the ACCESS Program's Integration Roadmaps for new resource providers](#))  (to be discussed in the Concept of Operations section);

For Both Categories

Proposals are encouraged to emphasize broader impacts and broadening participation engagements for a proposed resource and its operation. Such activities may include (but are not limited to):

- providing access to scientific disciplines and communities traditionally underserved by CI resources and services through, for example, science gateways such as those enabled by the *“Center of Excellence to Extend Access”*, *“Expand the Community”*, and *“Exemplify Good Practices for CI Through Science Gateways”* (SGX3), and/or
- taking into consideration the full lifecycle environmental impact of the proposed resource or services in either category, including its acquisition, usage, and eventual disposal. [Note: this solicitation is not meant to fund core research on sustainability in computing. Proposers interested in proposing such research may refer to [NSF 22-060 DCL: “Design for Sustainability in Computing and submission to Computer and Information Science and Engineering: Core Programs”](#)]

III. Award Information

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

During submission cycles accepting Category I proposals, no Category II proposals will be considered.

Category I awards shall be between \$10,000,000 and \$20,000,000 for up to 5 years of duration.

During submission cycles accepting Category II proposals, no Category I proposals will be considered.

Category II awards shall not exceed a total of \$5,000,000 and 5 years of duration.

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 laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

An organization may submit only one proposal per each competition specified in this solicitation but may be a subawardee on other proposals responding to this solicitation. The restriction to no more than one submitted proposal as lead institution is to help ensure that there is appropriate institutional commitment necessary for responsible oversight, by the potential recipient institution, of a national resource.

Collaborative projects may only be submitted as a single proposal in which a single award is being requested (PAPPG Chapter II.E.3.a). The involvement of partner organizations should be supported through subawards administered by the submitting organization.

These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently. In the event that an organization exceeds this limit, the proposal 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.**

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

An individual may be the PI or co-PI on no more than one proposal per each competition specified in this solicitation. There is no limit on the number of proposals with which an individual may be associated in

other capacities, such as senior/key personnel.

These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently. In the event that an individual exceeds this limit, the proposal 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.

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

The following provides additional guidance beyond that contained in the PAPPG or NSF Grants.gov Application Guide.

1. Cover Sheet:

Proposal titles must begin with "Category I: Title" or "Category II: Title" depending on the type of resource/services proposed.

Only personnel directly connected to the project should be listed as collaborators.

Collaborative efforts may only be submitted as a single proposal (See PAPPG Chapter II.E.3.a), in which a single award is being requested. The involvement of partner organizations should be supported through subawards administered by the proposing Resource Provider organization.

2. Project Description (30-page limit)

The page limit for the Project Description section of the proposal is 30 pages. In addition to the instructions described in the PAPPG or NSF Grants.gov Application Guide, the Project Description must include the following sections:

- a. Resource Specification;**
- b. S&E Application Performance;**

- c. **Resource Reliability and Usability;**
- d. **Project Management and Risk Mitigation;**
- e. **Security;**
- f. **Concept of Operations; and**
- g. **Broader Impacts**

Proposals submitted in response to Category I must address the themes described in Section II Project Description Category I – Capacity Resources.

Proposals submitted in response to Category II must address the themes described in Section II Project Description Category II – Innovative Prototypes/Testbeds.

Proposals submitted in response to both categories are encouraged to emphasize broader impacts and broadening participation engagements for a proposed resource and its operation as described in Section II Project Description.

a. Resource Specification

Proposals must describe the resource to be provisioned in this section. The description of the resource architecture should be commensurate with the type of resource being acquired (i.e. hardware and/or software and services) and highlighting any unique components. Aspects of the resource that are likely to influence the performance of S&E applications and workflows should also be specified. This section should also include a description of how the resource will complement and extend the current NSF-funded ACSS ecosystem; how new user communities will be attracted; what new computing methods/paradigms will be possible; and what scientific opportunities will be catalyzed.

Proposals including *hardware* resources should elaborate on the details of the hardware to be acquired. While relevant specifications will vary depending on the nature of the hardware resource, such details could include the processor and node type, memory hierarchy and bandwidth, inter-connect and I/O subsystem. The description should also include details on the software stack (vendor-supplied or open), container technology, tools, applications as well as system administration monitoring and management capabilities.

Proposals including *service* resources should elaborate on the details of the services to be acquired, with the understanding that they may differ substantively from the details of a hardware resource acquisition. Such details could include (but are not limited to): software environment, type of services being acquired (e.g., co-location, cloud computing, etc.); method of user access to the proposed services (e.g., interactive, job submission, or other mechanism); hardware specifications of initial computing ‘instances’ provided to users, if applicable; orchestration mechanisms; abstraction layer(s) present between computing capabilities and the user; initial applications that would be hosted by the service; and system administration, monitoring, and management capabilities.

Irrespective of a *hardware* or *service focus*, this section must describe the external network connectivity between the proposed resource and national networks, including potential integration with federated and/or distributed resources, regional and/or campus-supported resources, and/or commercial cloud services. S&E research applications can produce many terabytes to petabytes of data. Descriptions of how these data will be handled; how data integrity will be maintained; what backup and contingency procedures and schedules will be implemented; how data accessibility will be facilitated; and how archive storage will be provided, should be included as appropriate.

b. S&E Application Performance

For the purposes of this solicitation, applications are defined as any S&E computing application, suite of applications, that enables the scientific discovery process. This could include, but is not limited to, a single application, an ensemble/high-throughput model, data-analytic pipelines, or other discovery workflows.

This section should describe the types of S&E research challenges and use cases that motivate the detailed resource design. This description must include the expected impact of the resource to S&E research; the S&E research challenges

that motivate the selection for the innovative capabilities; and the expected impact of the specific new innovative capabilities of the resource.

Proposals must provide a compelling justification that explicitly addresses the new innovative capabilities' relevance to S&E. The features of applications motivating the design and configuration of the proposed innovative capability should be fully explained with respect to how the innovation expands the reach to new S&E research and research communities or enables applications that are difficult to address with the current NSF-funded ACSS resources.

Proposals must provide a persuasive set of S&E applications and use cases, including quantitative analyses through benchmarks and/or workflow metrics that clearly motivate how the resource will expand the range of S&E applications that can be currently tackled using existing NSF-funded ACSS.

c. Resource Reliability and Usability

Proposals must describe the types of system usage and job performance data that will be accessible to, and transparently visible from, third-party interfaces currently supported through ACCESS or other NSF-approved alternative.

Proposals must include an analysis of the reliability of the proposed production resource with appropriate justifications. Proposals must provide a detailed analysis of resource utilization goals to ensure that the proposed resource is effective and efficiently used as an instrument for the broader S&E research community.

The NSF award instrument will include a performance requirement on the availability of the resource. NSF requires that, when averaged over a month, production resources should be unavailable as a result of scheduled and unscheduled maintenance no more than 5% of the time. Proposals must provide an analysis establishing the basis supporting the expectation that the proposed system will achieve this performance requirement.

This section should also include descriptions of service level agreements (SLAs) in measurable and verifiable terms. These can include, for example:

- reliability, availability, and usability operating targets (with consideration for planned and unplanned services "downtime");
- compliance with the policies and other requirements, including with respect to maintenance of cybersecurity, privacy, confidentiality, intellectual property, location of data and/or computations, disclosure/access, and/or disposition (including potentially appropriate deletion/retention) of all processed data and/or computations, etc.;

d. Project Management and Risk Mitigation

Proposals must provide a detailed implementation plan and corresponding independently verifiable metrics for developing and/or acquiring and deploying the proposed resource, including any innovative capabilities. A detailed month-by-month schedule must be provided, including an early operations phase period of not less than 30 consecutive days to demonstrate and confirm the innovative capabilities of the proposed resource.

Proposals must provide details on the sub-contract(s) with the relevant vendor(s) that describe the contractual terms of any substantial acquisition of hardware, software, or services.

Proposals must describe the availability of experts to address any system integration problems that arise as the resource is deployed. This expertise may be provided by the proposing Resource Provider and/or by other vendor, academic, or government partners. Proposers should make clear their previous associations, if any, with these partners. The breadth of knowledge, depth of interaction, and technical abilities of partners will be considered in the review process. This knowledge and expertise are particularly important in supporting advanced programming or usage paradigms tools, system components including I/O subsystems, virtualization, and composable services.

Proposals must describe S&E community user access to the resource during the deployment phase and prior to system acceptance, including during testing.

Proposals must describe the experience of the proposing organization in the management of awards of the similar scale to that being presently proposed and the resources that would be available to manage an award. If the proposal involves a substantial acquisition, describe the experience of the proposing organization in the management of large sub-contracts to vendors for the acquisition of HPC systems. Proposals must describe the organizational resources that would be available to manage any such sub-contract issued under an award made because of this solicitation.

Proposals must provide a detailed risk mitigation plan, identifying both technical and management risks as well as strategies to mitigate such risks. The risk management plan must include risks specific to the innovative capability such as S&E community adoption or sustainability.

e. Security

Proposals must describe both physical and operational security plans for the proposed resource. Proposals must describe project roles and responsibilities with respect to cybersecurity for the facility as well as how risk will be assessed; what technical safeguards will be in place; what administrative safeguards will be maintained; what physical safeguards are planned; how policies and procedures for cybersecurity will be established and maintained; what the plans are for awareness and training; and what procedures will be in place for notification to NSF, the user community, other CI communities, and appropriate authorities (e.g., local police, the Federal Bureau of Investigation). Proposers must describe how the effectiveness of the proposed cybersecurity program will be evaluated and assessed, and what approach will be taken to implement the cybersecurity plan. The section should also discuss how the resource fulfills and advances the NSF priorities for [research security](#).

f. Concept of Operations

Proposals must provide a plan for operations, maintenance, and user support that includes a description of the anticipated requirements of the S&E research community; a description of how resources will be allocated; and any other operational details likely to have an impact on user access or usage of the proposed system. The plans should describe the number and anticipated qualifications of the types of personnel that will be involved with the provision of user support as well as user training that will be provided.

Proposals must describe the experience of the proposing organization in operating production systems, including any experience in operating in a physically distributed environment. This section must include a description of whether operational support was provided on a 24/7 basis or was provided on a more limited basis; the number and types of users; the types of computation performed; and the nature of the user support provided.

The section must include planned success metrics and related data reporting associated with the operations phase of the resource. Such metrics should be flexible and allow for future alignment with peer ACSS RPs, as well as responsive to future guidance from the ACCESS program and/or NSF. Such metrics should include, but are not limited to evaluating management performance, reporting usage and job performance data to the utilities supported by the ACCESS program or its successor, determining user needs, and evaluating user satisfaction.

Proposals must describe the qualifications of the Principal Investigator and co-Principal Investigators regarding her or his ability to manage a project of this size and complexity, as well as manage a resource with a potentially large number of external users.

Proposals must provide an analysis of the annual operating costs of the resource for the duration of the award, including the cost of providing user support. Detailed operating cost estimates should include any necessary maintenance contracts. Operating cost estimates should also include (if applicable) the cost of power and physical security, the cost of external network connectivity from the location(s) of the system to other CI projects, national networks, including to potentially integrate effectively with federated and/or distributed resources, regional and/or campus-supported resources, and/or commercial cloud services, and costs associated with leasing machine room space, if necessary. An estimate of the costs associated with the number of full-time equivalents (FTEs) necessary to maintain 24/7 operations of the proposed system should be provided as well as an estimate of the costs associated with the number of FTEs necessary to provide effective user support. Services leveraged from other CI projects and/or commercial cloud services must also be described.

A more detailed explanation of the budget for user support and operating costs should be provided in the Supplementary Documents section of the proposal (this should not exceed 5 pages). Information provided will be used to help NSF assess the operating cost-performance attributes of the proposed system.

Any other factors that are anticipated to have an impact on the Total Cost of Ownership of the proposed resource must also be provided.

h. Broader Impacts

In addition to the instructions provided in the PAPPG, proposals must describe any complementary and leveraged aspects within the CI ecosystem, with emphasis on other NSF-funded CI projects and priorities described in the Program Description.

3. Budget and Budget Justification

Proposals must include standard yearly and cumulative budget pages as described in the PAPPG. Note that any projected operating costs must NOT be included in this section and should be detailed in the supplementary documents as described below.

4. Supplementary Documents

In addition to the required documents specified in the PAPPG, proposals should include the following as Other Supplementary Documents:

- A list of all institutions and companies involved in the project, together with their roles within the project and the levels of funding.
- Actual or estimated performance benchmark results as described in Section V.A. Proposal Preparation Instructions, S&E Application Performance. This section should not be used to continue discussion or analysis of the merits of the Service Provider, vendor or vendors, or system.
- Detailed Projected Operating Costs as described in Section V.A. Proposal Preparation Instructions, Concept of Operations. This should not exceed 5 pages.
- (Optional, but encouraged) Representative vendor quotes for the proposed resource capability.
- Letters of collaboration from individuals who are described in the Project Description as involved in the project in a senior capacity but who are not members of the lead proposing organization, or from representatives of institutions or organizations collaborating with the lead institution, are allowable, as described in the PAPPG. Note that letters of endorsement should not be included in proposals.
- Any substantial collaboration with individuals not included in the budget should be described in the Facilities, Equipment and Other Resources section of the proposal and documented in a letter of collaboration from each collaborator.

Proprietary information

Proposals containing patentable ideas, trade secrets, and/or privileged or confidential commercial or financial information, disclosure of which may harm the proposer, should be clearly marked where appropriate in the proposal and labeled with the following legend:

- *"The following is (proprietary or confidential) information that (name of proposing organization) requests not be released to persons outside the U.S. Federal Government, except for purposes of review and evaluation."*

Note that proposals submitted to this solicitation will be reviewed by a group of experts that include people who are not U.S. Federal Government personnel.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

Each award will support the acquisition and deployment of hardware, software, and associated personnel costs, including acceptance testing. Detailed budgetary information should be provided in the Budget Justification section of the proposal. Operating costs (as described in the required supplementary document) are NOT to be included in the Budget or Budget Justification sections of the proposal.

The proposal amount cannot exceed \$20,000,000 for a single Category I award and \$5,000,000 for a single Category II award. Acquisition and deployment of the full system should be completed within 12 months of the award start date. The number of years that the proposed system will be deployed can vary with the nature of the system. In most cases, it is anticipated to be part of the NSF-funded ACSS program for up to five years.

Each proposal may be for an acquisition that occurs in one step near the beginning of the award period or for an acquisition that is deployed in phases during the award period.

User support and operating costs of up to 15% of the initial acquisition costs per year, after acceptance of the proposed system, will be funded via consideration of a supplement to the awarded cooperative agreement or other proposal mechanism. Detailed budgetary information should be provided in the Budget Justification section of the proposal.

Prospective PIs are reminded that proposals with budgets exceeding the maximum total will be returned without review. For this purpose, a multi-organization collaborative project is treated as one proposal for which the above limits apply.

C. Due Dates

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

October 29, 2024

Category I Submissions

June 24, 2025

Category II Submissions

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?](https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationanc)

[_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationanc](https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationanc)

For Research.gov user support, call the Research.gov Help Desk at 1-800-381-1532 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/applicants>. In addition, the NSF Grants.gov Application Guide (see link in Section V.A)

provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact

Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

The NSF [Grants.gov Proposal Processing in Research.gov informational page](#) provides submission guidance to applicants and links to helpful resources including the NSF [Grants.gov Application Guide](#), [Grants.gov Proposal Processing in Research.gov how-to guide](#), and [Grants.gov Submitted Proposals Frequently Asked Questions](#). Grants.gov proposals must pass all NSF pre-check and post-check validations in order to be accepted by Research.gov at NSF.

When submitting via Grants.gov, NSF strongly recommends applicants initiate proposal submission at least five business days in advance of a deadline to allow adequate time to address NSF compliance errors and resubmissions by 5:00 p.m. submitting organization's local time on the deadline. Please note that some errors cannot be corrected in Grants.gov. Once a proposal passes pre-checks but fails any post-check, an applicant can only correct and submit the in-progress proposal in Research.gov.

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

VI. NSF Proposal Processing And Review Procedures

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

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

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

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

engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

the Project Description section of the proposal). Reviewers are strongly encouraged to review the criteria, including PAPPG Chapter II.D.2.d(i), prior to the review of a proposal.

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

Reviewers will be asked to assess the adequacy of the descriptions provided in the required sections of the Project Description (these are described in Section V.A. Proposal Preparation Instructions above):

- Resource Specification;
- S&E Application Performance;
- Resource Reliability and Usability;
- Project Management and Risk Mitigation;
- Security;
- Concept of Operations; and
- Broader Impacts.

B. Review and Selection Process

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

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

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

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

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

VII. Award Administration Information

A. Notification of the Award

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

B. Award Conditions

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

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

TBD - Programmatic Terms and Conditions:

The cooperative agreements will have an extensive section of Special Conditions relating to the period of performance, Project Execution Plan including plan to develop performance metrics, recipient responsibilities, NSF responsibilities, joint NSF- recipient responsibilities, funding and funding schedule, reporting requirements, key personnel, and other conditions. NSF has responsibility for providing general oversight and monitoring of the project(s) to help assure effective performance and administration, as well as facilitating any coordination among the recipient as necessary to further the objectives of the program. Within the first 90 days of the Award, a revised project execution plan will be submitted to NSF for concurrence.

Awards made as a result of this competition will include performance requirements and metrics for the proposed systems. If appropriate, a recipient will include terms and conditions in any subaward agreement to address schedule and performance expectations and the impact of delays in delivery.

C. Reporting Requirements

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

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

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

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

Additional reporting requirements will be negotiated with the Resource Provider prior to award and will be incorporated into the special terms and conditions of the award. Such requirements may include, for example, monthly and quarterly reports reverse-/site visits, and other requirements to enable NSF oversight of the award. The level of oversight will be appropriate to the complexity of the award.

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:

- Robert Chadduck, Program Director, CISE/OAC, telephone: (703) 292-8970, email: rchadduc@nsf.gov
- Andrey Kanaev, Program Director, CISE/OAC, telephone: (703) 292-2841, email: akanaev@nsf.gov
- Alejandro Suarez, Program Director, CISE/OAC, telephone: (703) 292-7092, email: alsuarez@nsf.gov
- Sharon Geva, telephone: (703) 292-7058, email: sgeva@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-381-1532
- Research.gov Help Desk e-mail: rgov@nsf.gov

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.

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National Science Foundation, 2415 Eisenhower Ave Alexandria, VA 22314
Tel: [\(703\) 292-5111](tel:7032925111),