

# NSF 24-594: Science and Technology Centers: Integrative Partnerships

## Program Solicitation

### Document Information

#### Document History

- **Posted:** August 8, 2024
- **Replaces:** [NSF 22-521](#)

[View the program page](#)



#### U.S. National Science Foundation

Office of Integrative Activities  
Directorate for Biological Sciences  
Directorate for Computer and Information Science and Engineering  
Directorate for STEM Education  
Directorate for Engineering  
Directorate for Geosciences  
Directorate for Mathematical and Physical Sciences  
Directorate for Social, Behavioral and Economic Sciences  
Office of International Science and Engineering

**Preliminary Proposal Due Date(s) (*required*)** (due by 5 p.m. submitting organization's local time):

November 20, 2024

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

June 02, 2025



### TABLE OF CONTENTS

[Summary of Program Requirements](#)

[I. Introduction](#)

[II. Program Description](#)

[III. Award Information](#)

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

## Important Information And Revision Notes

This solicitation is updated to clarify language related to Center education and knowledge transfer activities, broadening participation, and preliminary and full proposal preparation.

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:

Science and Technology Centers: Integrative Partnerships

#### Synopsis of Program:

The Science and Technology Centers (STC): Integrative Partnerships program supports exceptionally innovative, complex research and education projects that require large-scale, long-term awards. STCs focus on creating new scientific paradigms, establishing entirely new scientific disciplines, and developing transformative technologies which have the potential for broad scientific or societal impact. STCs conduct world-class research through partnerships among institutions of higher education, national laboratories, industrial organizations, other public or private entities, and via international collaborations, as appropriate. They provide a means to undertake potentially groundbreaking investigations at the interfaces of disciplines and/or highly innovative approaches within disciplines. STCs may involve any area

of science and engineering that NSF supports. STC investments support the NSF vision of creating and exploiting new concepts in science and engineering and providing global leadership in research and education.

Centers provide a rich environment for encouraging scientists, engineers, and educators to take risks in pursuing discoveries and new knowledge. STCs foster excellence in education by integrating education and research, and by creating connections between learning and inquiry so that discovery and creativity fully support the learning process.

NSF encourages input and participation in the STC program from the full spectrum of diverse talent that society has to offer which includes underrepresented and under-served communities. In addition, NSF expects STCs to both involve individuals who are members of groups that have been traditionally underrepresented in science, engineering and mathematics at all levels within the Center (faculty, staff, students, and postdoctoral researchers) as well as be a leader in broadening participation in STEM. Centers may use either proven or innovative mechanisms based on the relevant literature to address matters such as recruitment, retention, success, and career progression of *all* individuals in the Center.

Along with research, education and broadening participation, Centers must undertake activities that facilitate knowledge transfer, i.e., the exchange of scientific and technical information with the objective of disseminating and utilizing knowledge broadly in multiple sectors. Examples of knowledge transfer include technology transfer, providing key information to public policy-makers, or dissemination of knowledge from one field of science to another.

## **Broadening Participation In STEM**

NSF recognizes the unique lived experiences of individuals from communities that are underrepresented and/or under-served in science, technology, engineering, and mathematics (STEM) and the barriers to inclusion and access to STEM education and careers. NSF highly encourages the leadership, partnership, and contributions in all NSF opportunities of individuals who are members of such communities supported by NSF. This includes leading and designing STEM research and education proposals for funding; serving as peer reviewers, advisory committee members, and/or committee of visitor members; and serving as NSF leadership, program, and/or administrative staff. NSF also highly encourages demographically diverse institutions of higher education (IHEs) to lead, partner, and contribute to NSF opportunities on behalf of their research and education communities. NSF expects that all individuals, including those who are members of groups that are underrepresented and/or under-served in STEM, are treated equitably and inclusively in the Foundation's proposal and award process.

NSF encourages IHEs that enroll, educate, graduate, and employ individuals who are members of groups underrepresented and/or under-served in STEM education programs and careers to lead, partner, and contribute to NSF opportunities, including leading and designing STEM research and education proposals for funding. Such IHEs include, but may not be limited to, community colleges and two-year institutions, mission-based institutions such as Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), women's colleges, and institutions that primarily serve persons with disabilities, as well as institutions defined by enrollment such as Predominantly Undergraduate Institutions (PUIs), Minority-Serving Institutions (MSIs), and Hispanic Serving Institutions (HSIs).

"Broadening participation in STEM" is the comprehensive phrase used by NSF to refer to the Foundation's goal of increasing the representation and diversity of individuals, organizations, and geographic regions that contribute to STEM teaching, research, and innovation. To broaden participation in STEM, it is necessary to address issues of equity, inclusion, and access in STEM education, training, and careers. Whereas all NSF programs might support broadening participation components, some programs primarily focus on supporting broadening participation research and projects. Examples can be found on the NSF [Broadening Participation in STEM](#) website.

**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.

- Dragana Brzakovic, telephone: (703) 292-5033, email: [stc2026@nsf.gov](mailto:stc2026@nsf.gov)

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

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

**Award Information**

**Anticipated Type of Award:** Cooperative Agreement

**Estimated Number of Awards:** up to 5

Centers. Each award will be made as a cooperative agreement to the lead institution, with an initial commitment for five years of support and a possibility of continuation for five additional years. Number of awards is approximate and subject to availability of funds in FY2026.

**Anticipated Funding Amount:** \$30,000,000

Up to \$ 30,000,000 annually, subject to the appropriation of funds.

**Eligibility Information**

**Who May Submit Proposals:**

Proposals may only be submitted by the following:

- Preliminary proposals and invited full proposals may only be submitted by institutions of higher education that are located in the United States, its territories or possessions, and have doctoral degree-granting research and education programs in any area of research supported by NSF. The lead institution is expected to develop partnerships or arrangements with other universities, colleges, or other scientific organizations, such as national laboratories, research museums, private sector research laboratories, state and local government laboratories, and international organizations as appropriate to enable the Center to attain its strategic goals.

**Who May Serve as PI:**

The PI must be a full-time faculty member at an institution of higher education and have an established record of leading research teams.

**Limit on Number of Proposals per Organization: 3**

A single organization may submit a maximum of three preliminary proposals as the lead institution. Full proposals are to be submitted only when invited by NSF. There is no limit on the number of proposals in

which an organization participates as a partner institution. The STC program will not support more than one Center from any one lead institution in this competition.

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

A PI or co-PI on one proposal in this competition may not be a participant in another STC proposal under review in the same competition. If a proposal is declined at any stage of the review process, a PI or co-PI on the declined proposal may then participate in another STC proposal. This eligibility constraint will be strictly enforced. In the event that an individual exceeds this limit, proposals will be accepted based on the earliest date and time of proposal submission (i.e., the first compliant proposal received will be accepted and the others will be returned without review).

#### **Proposal Preparation and Submission Instructions**

##### **A. Proposal Preparation Instructions**

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

##### **B. Budgetary Information**

- **Cost Sharing Requirements:**

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

Not applicable.
- **Other Budgetary Limitations:**

Not Applicable

##### **C. Due Dates**

- **Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. submitting organization's local time):

November 20, 2024
- **Full Proposal Deadline(s)** (due by 5 p.m. submitting organization's local time):

June 02, 2025

#### **Proposal Review Information Criteria**

##### **Merit Review Criteria:**

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

### **Award Administration Information**

#### **Award Conditions:**

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

#### **Reporting Requirements:**

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

## **I. Introduction**

### **The Science and Technology Centers: Integrative Partnerships — Concept**

The Science and Technology Centers (STC): Integrative Partnerships-Discovery and Innovation to Address Vexing Scientific and Societal Challenges program supports exceptionally innovative, complex research and education projects that require large-scale, long-term awards. STCs focus on creating new scientific paradigms, establishing entirely new scientific disciplines, and developing transformative technologies that have the potential for broad scientific or societal impact. STCs conduct world-class research through partnerships among institutions of higher education, national laboratories, industrial organizations, other public and private entities, and via international collaborations, as appropriate.

The STC program supports potentially groundbreaking investigations at the interfaces of disciplines and/or highly innovative approaches within disciplines. When appropriate, teams are encouraged to embrace convergence to achieve deep integration across disciplines and sectors. STCs may involve any area of science and engineering that NSF supports. STCs exploit opportunities in science, engineering, and technology where the complexity of the research agenda requires the duration, scope, scale, flexibility, and facilities that center support can provide. They catalyze U.S. leadership in research in a world in which discovery, learning, and innovation enterprises are increasingly interconnected and increasingly global. Centers offer the science and engineering community a venue for developing effective mechanisms to integrate scientific and technological research and education activities; to explore better and more effective ways to educate students; to broaden participation of underrepresented groups in science, mathematics and engineering as well as under-resourced institutions; and to ensure the timely transfer of research and education advances made in service to society. STC lead and partner organizations work together as an integrated whole to achieve the shared research, education, broadening participation, and knowledge-transfer goals of the Center. The STC program seeks to ensure a diverse portfolio of talent, skills, abilities and experience at centers including diversity among types of institutions leading centers and diversity amongst center directors.

## **II. Program Description**

### **A. Objectives of the STC Program are to:**

- Support potentially groundbreaking investigations at the interfaces of disciplines or highly innovative approaches within disciplines;
- Support research and education of the highest quality, in a center-based environment, where the whole is greater than the sum of its parts;
- Exploit opportunities in science, education, engineering and/or technology where the complexity of the research agenda requires the advantages of scope, scale, flexibility, duration, equipment, and facilities that a Center can provide;
- Support the creation of new scientific paradigms, establishment of new scientific disciplines, and development of transformative technologies;
- Foster science and engineering in service to society;

- Engage and develop the Nation's intellectual talent, including groups underrepresented in science, mathematics and engineering, in the conduct of research and education activities;
- Increase the participation of minority-serving institutions in center-scale science and engineering research;
- Promote organizational connections and linkages within and among campuses, and beyond (e.g., K-12 educational institutions; state, local and Federal agencies, national labs, industry, and international collaborations), capitalizing upon cyberinfrastructure, communication technologies and other modern advances to facilitate these linkages;
- Focus on integrative learning and discovery and the preparation of U.S. students for a broad set of career paths; and
- Support research collaborations that energize the Nation's economic competitiveness, sustain its global leadership in science and engineering, expand the geography of innovation, and improve the quality of life for everyone.

## **B. Characteristics of Science and Technology Centers**

An STC typically comprises a lead institution and several partners. The lead institution accepts overall management and budgetary responsibility for the proposed Center and is responsible for oversight of sub-awards to partner institutions. The partners comprising an STC share a common research vision and work on developing sustainable collaborations while jointly pursuing highly innovative research pathways to address deep scientific questions or pressing societal needs. They capitalize on the latest scientific and technological developments to seek ways to develop groundbreaking, often risky approaches, to address what seem to be intractable problems. They work towards developing and maintaining a flexible and agile research plan to accommodate change as the research proceeds, new challenges and opportunities arise, and the global landscape of science evolves.

STCs may vary in size and exhibit diverse forms of organization, collaboration, and operation suited to their individual needs. Not every partner must support every aspect of the Center's activity, but all of the expected features of a Center must be encompassed in the integrated portfolio of the partners' activities. Partnerships may include multi-organizational collaborations or arrangements with other universities/colleges, national laboratories, research museums, private sector research laboratories, industrial organizations, state and local government laboratories, and international collaborations. NSF encourages, but does not require, STCs to include international dimensions (e.g., collaboration with foreign research partners and international research experiences for students) to enhance research and promote the full spectrum of diverse talent that society has to offer and an internationally competitive science and engineering workforce.

The STC program seeks to support impactful higher education activities directed toward the development of a globally engaged workforce of scientists, engineers, and citizens that represent the full spectrum of diverse talent that society has to offer and is well-prepared for a broad set of career paths. The education goals of an STC may address the needs of students participating in the Center's research activities or students in broader fields of research represented by the STC activities. STCs are encouraged to focus their education efforts on specific programs that are appropriately integrated into the research activities of the Center rather than attempting to be comprehensive. Education programs and activities should be developed in the context of current education research and be monitored through a formal evaluation effort.

NSF expects STCs to demonstrate leadership in the involvement of the full spectrum of diverse talent that society offers at all levels (faculty, students, and postdoctoral researchers) within the Center. STCs are encouraged to form substantive and long-term partnerships and collaborations among various types of institutions to ensure participation of the full spectrum of diverse talent. Ideally, all academic partners will contribute to the research, education, and broadening participation components of the STC.

STCs foster knowledge transfer that involves the exchange of scientific and technical information between the Center and external stakeholders who can then apply and utilize the knowledge to create further advances. Examples of knowledge transfer include, but are not limited to, establishing spin-off companies, license agreements or other technology transfer arrangements to support innovation and providing key information to support policy-making decisions. Knowledge transfer can be facilitated in a variety of ways, including but not limited to formal partnerships established through membership agreements, visiting research/teaching positions for industrial scientists at the STC, external use of industrial

or university facilities, student internships in industry or public policy arenas, student mentoring by industrial or other partners, innovative use of cyberinfrastructure, informal science education, and/or other mechanisms.

### **C. Leadership, Management, and Oversight of STCs**

One of the partner institutions acts as the lead institution and accepts overall management and budgetary responsibility for the proposed Center. The Center Director must provide the leadership to develop and lead a diverse team to fulfill the vision of the Center. It is expected that the Center Director will have experience in leading research teams and excellent verbal and written communication skills. They are responsible for the management, staffing, and resource allocation of the Center, and for serving as the liaison between the Center and the national network of STC Directors. The Center Director must also ensure that the STC communicates effectively with NSF and the other STCs electronically, including by web-based distribution of information and videoconferencing. Key members of the Center management team must possess appropriate management experience and qualifications to administer their components of the Center. The Center team must develop a management plan to share responsibilities appropriately.

STC Directors participate in the National Network of STC Directors. This group is charged with addressing common goals, problems, and opportunities, and facilitating personnel and resource exchanges as well as ensuring linkages and cooperation among STCs. Typical functions of this Network include: facilitating interactions to address research, education, knowledge transfer, and management issues and opportunities that transcend individual Center capabilities; planning joint implementation strategies, workshops, and other forums; establishing and sharing best practices; and developing documents, web-sites or other forms of engagement to enhance public understanding of the importance of science, engineering, technology and education advances in service to society.

Each Center will establish, maintain, and convene at least annually an External Advisory Committee (EAC). The function of the EAC is to provide guidance, advice, and direction for all of a Center's activities, consistent with its vision, goals, and objectives. The EAC must include members who are able to assess each aspect of the project including management, research, education, broadening participation, and knowledge transfer. EAC membership is subject to NSF approval and must include representatives from those sectors served by the Center (e.g., institutions of higher education, industry, state and local agencies, national laboratories). The EAC must include members from groups that are underrepresented in science and engineering. Individuals with a financial, institutional, or collaborative connection to the Center may not serve as members of the EAC.

### **D. Summary of STC Features**

Each STC must:

- Be focused on exceptionally innovative, complex research and education projects that require large-scale, long-term funding;
- Be based at an institution of higher education which assumes responsibility for oversight of sub-awards to all other partner institutions;
- Be directed by a faculty member with experience in leading research teams;
- Demonstrate institutional commitment to achieving strategic goals that are shared by the lead and other partnering institutions;
- Establish multi-institutional collaborations or linkages with other universities/colleges, national laboratories, research museums, private sector research laboratories, state and local government organizations, and international collaborations, as appropriate;
- Develop a management plan that integrates the research, education, broadening participation, and knowledge transfer activities across all partners and affiliates;
- Incorporate teams at all organizational levels of the Center that represent the full spectrum of diverse talent that society has to offer and include members of groups underrepresented in STEM;
- Provide research and education opportunities for U.S. graduate and undergraduate students, postdoctoral researchers and faculty that will result in outcomes consonant with the Center's goals;



- Facilitate knowledge transfer through significant intellectual exchange between the Center and various types of institutions and organizations (e.g., nonprofit organizations; national laboratories; industry; Federal, state, and local governments); and,
- Establish and convene at least annually an External Advisory Committee to provide guidance, advice, and oversight.

**E. Timeline for this FY 2024 to FY 2026 STC competition:**

- Preliminary proposals due November 20, 2024
- Invited list informed end of February 2025
- Invited full proposals due June 2, 2025
- Notification of invitation for site visit end of September 2025
- Site visits October - December 2025
- Anticipated start date of awards, September 1, 2026

**III. Award Information**

Up to a total of \$30 million may be available, pending the availability of funds, for first-year support of newly funded Centers beginning in FY 2026. NSF expects to make up to 5 awards, contingent on the availability of funds and receipt of competitive proposals. Each award will be made as a cooperative agreement to the lead institution, with an initial commitment for five years of support and a possibility of continuation for five additional years. The amount of NSF's investment in each Center will depend upon the needs, plans, and opportunities offered by the Center, as well as the availability of NSF funds. Oversight of each individual STC is the responsibility of the appropriate NSF directorate in coordination with the Office of Integrative Activities (OIA).

Support for each year of the cooperative agreement of a funded STC will be contingent upon a satisfactory annual review of the Center's progress and future plans, with an emphasis on the quality and impacts of the research, education, broadening participation, and knowledge transfer activities. In the fourth year of operation, the STC may submit a continuation proposal for five additional years of NSF support. During the subsequent annual review, the STC's achievements and future plans will be evaluated comprehensively to determine if the STC is meeting its goals and objectives as well as the goals and objectives of the STC Program. This in-depth review will consist of an *ad hoc* and/or panel review of the continuation proposal and a formal on-site review, involving external reviewers who will produce a written report to NSF. Centers successful in passing the fourth-year review will be continued for another five years, commencing at the beginning of the sixth year. The cooperative agreement will include a two-year phase-out period for years nine and ten. Centers that pass the fourth-year review will continue to be reviewed by NSF every 12 months. Centers that do not pass the fourth-year review will be phased-out over a one-year period at a reduced level of support. The NSF may support an STC for a maximum of ten years.

**IV. Eligibility Information**

**Who May Submit Proposals:**

Proposals may only be submitted by the following:

- Preliminary proposals and invited full proposals may only be submitted by institutions of higher education that are located in the United States, its territories or possessions, and have doctoral degree-granting research and education programs in any area of research supported by NSF. The lead institution is expected to develop partnerships or arrangements with other universities, colleges, or other scientific organizations, such as national laboratories, research museums, private sector research laboratories, state and local government laboratories, and international organizations as appropriate to enable the Center to attain its strategic goals.

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

The PI must be a full-time faculty member at an institution of higher education and have an established record of leading research teams.

### **Limit on Number of Proposals per Organization: 3**

A single organization may submit a maximum of three preliminary proposals as the lead institution. Full proposals are to be submitted only when invited by NSF. There is no limit on the number of proposals in which an organization participates as a partner institution. The STC program will not support more than one Center from any one lead institution in this competition.

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

A PI or co-PI on one proposal in this competition may not be a participant in another STC proposal under review in the same competition. If a proposal is declined at any stage of the review process, a PI or co-PI on the declined proposal may then participate in another STC proposal. This eligibility constraint will be strictly enforced. In the event that an individual exceeds this limit, proposals will be accepted based on the earliest date and time of proposal submission (i.e., the first compliant proposal received will be accepted and the others will be returned without review).

### **Additional Eligibility Info:**

Past directors of STCs may participate in this open competition only if the proposed research and education topics or themes are substantially different from those they pursued with prior NSF Center support. The proposal must focus on a different research topic. New proposals that simply extend the methods and intent of a past STC to a slightly larger scope or a new geographic area will be returned without review.

The STC Program complements the Engineering Research Centers (ERCs), the Materials Research Science and Engineering Centers (MRSECs), Centers of Chemical Innovation (CCIs), National Artificial Intelligence Research Institutes, and other NSF programs that support group research and education activities. Teams that aspire to develop center proposals in the future are encouraged to consider applying to the [Growing Convergence Research](#) program to crystallize their vision and develop team integration. STCs may involve any area of science and engineering that NSF supports. Participation in a Center does not preclude individuals from receiving NSF support for their individual research in complementary areas.

## **V. Proposal Preparation And Submission Instructions**

### **A. Proposal Preparation Instructions**

**Preliminary Proposals (required):** Preliminary proposals are required and must be submitted via Research.gov, even if full proposals will be submitted via Grants.gov.

When preparing a preliminary proposal for this competition, proposers are advised to consult Section II. Program Description for general information pertinent to the STC program and Section VI. Proposal Review Information for information on specific questions that reviewers of preliminary proposals will be asked to address.

**Preliminary Proposal Set-Up:** Select "Prepare New Preliminary Proposal" in Research.gov. Search for and select this solicitation title in Step One of the Preliminary Proposal wizard. The information in Step 2 is pre-populated by the system. In Step 3 select "Single proposal (with or without sub-awards). Separately submitted collaborative preliminary proposals will be returned without review.

The required components of the preliminary proposal are given below. Page limitations given here will be strictly enforced. Proposers should review the most current PAPPG for specific information and format for the required sections. No other sections are required or may be included in the preliminary proposal.

Senior/Key Personnel: The preliminary proposal must show the proposed Center Director as the PI. Other major participants, identified a co-PIs or Other Senior/Key Personnel, may include any faculty and staff members whose research, education, knowledge transfer, or broadening participation efforts will be supported by the Center.

(1) Cover Sheet. For planning purposes, September 1, 2026 should be shown as the start date.

(2) Project Summary. (1 page maximum) The Project Summary must have three separate section headers entitled "Overview", "Intellectual Merit", and "Broader Impacts"; each heading must be on its own line with no other text on that line. The summary should be informative to those working in the same or related field(s), and understandable to a broad audience within the scientific domain.

*At the end of the Project Summary, indicate up to three NSF divisions that are the most relevant for your center research activities. They should be listed in order of priority, i.e., the first listed should be the most relevant. Also include up to three keywords that pertain to your research topics, again listed in order of priority.*

(3) Project Description (12 pages maximum). Results from Prior NSF Support should not be included. Links to URLs may not be used. Include the following sections:


3.a. *Center Rationale* - Articulate your vision for the proposed Center that clearly outlines the grand challenge(s) being addressed, the breakthroughs being sought, the potential impacts, and intended legacies of the center. Explain the unique opportunities that an integrated STC will provide and describe what will be achieved in the center mode that could not be achieved with other NSF funding mechanisms, including other NSF centers programs. Address the timeliness of the proposed center (why is this the right time for the center and why is this an important area for a research investment at this time).

3.b. *Center Plan* - Provide an overview of your research plan, in the context of national and global landscapes of relevant scientific fields, with sufficient detail to allow the assessment of the scientific merit and to justify the necessity for the center mode of operation. Delineate what you anticipate will be the major accomplishments over the first five years of the Center's existence. Include a description of what you perceive will be the major challenges and bottlenecks in achieving these accomplishments and explain why.

3.c. *Team Description* - Describe the role and assets each participating organization brings to the center. Briefly describe the role that each team member will have in addressing the center's goals. Highlight the unique assets and strengths, including the diversity of experiences and perspectives, of the proposing team compared to other groups working in related areas.

**BROADER IMPACTS** (*Please note: The Project Description must include a separate section header labeled Broader Impacts and the heading must be on its own line with no other text on that line.*) Include this section header between Sections 3.c and 3.d.

3.d. *Integration strategies* - Describe how the proposed research areas/themes integrate with each other to realize the Center's research vision. Describe the focus of the Center's education, broadening participation, and knowledge transfer activities along with mechanisms for assessing these activities' impacts. Outline how the integration of research, education, and knowledge transfer, in a center-level activity, will advance the proposed research. Identify specific activities and mechanisms that will enable cross-organizational and cross-sector integration of the team. Address the specific roles and responsibilities of the PI, co-PIs, and other Senior Personnel in leading the center and developing a center culture.

3.e. *Institutional Commitment to Broadening Participation* - Using no more than one paragraph, describe indicators of institutional commitment to promoting inclusion of full spectrum of diverse talent that society has to offer. For example, if one or more institutional members of the collaboration have a SEA Change Institutional Award (<https://seachange.aaas.org/> ) , the level of the award(s) could be provided; if an institution has or had an ADVANCE Institutional Transformation grant (<https://new.nsf.gov/funding/opportunities/advance-organizational-change-gender-equity-stem-academic-professions-advance>), its impact could be summarized; if nothing similar applies, other institution-wide activities sponsored by the leadership of the institution could be described.

(4) References Cited (2-page limit). See NSF PAPPG instructions for format.

#### (5) Senior/Key Personnel Documents

The following information must be provided for all individuals designated as Senior/Key Personnel.

- Biographical Sketch
- Collaborators & Other Affiliations Information

(6) Supplementary Documents (to be entered in the Other Supplementary Documents section of Research.gov). A list of Partner organizations and Project Personnel as described below is required. This information provides NSF and reviewers with a comprehensive list of personnel and organizations involved in the STC.

(a) List of all project personnel, organized alphabetically, who have a role in the management, research, education, broadening participation, and knowledge transfer components of the Center. Use the following format: last name, first name, institution/organization.

(b) List of all institutions and organizations with which project personnel are affiliated. Designate for each an appropriate category: Institution of Higher Education, National Laboratory, Federal Government, Industry, Non-Governmental Organization, State/Local Government, or International organization.

#### **Information to be submitted to NSF via the Single Copy Documents Section.**

##### **Optional**

- List of suggested reviewers or reviewers not to include (with a brief explanation or justification for why the reviewer should be excluded).
- Proprietary or privileged information (if applicable).

No other items or appendices are to be included. Preliminary proposals containing items other than those required above will be returned without review.

#### **Required Information to be submitted to NSF via email.**

In addition to their submission in the supplementary documents section of the proposal, the proposer is required to send items 6(a) and 6(b)--lists of all personnel and participating organizations--in form of an excel two tab spreadsheet via email to [stc2026@nsf.gov](mailto:stc2026@nsf.gov). These lists must be sent immediately after the proposal is submitted. The email subject line should be principal investigator's last name followed by the proposal number. The excel spreadsheet should be named the same (principal investigator's last name followed by the proposal number).

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

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

copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov).

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

**Important Instructions:** Full proposals will be accepted only if invited by NSF. When preparing a full proposal for this competition, proposers are advised to review the Program Description and the Proposal Review Information found in this solicitation for general information pertinent to this program.

As a multi-institution STC, the proposal must be submitted as a single, integrated proposal by the lead institution, with proposed sub-awards to the other partner institutions. **Separate proposals from each partner will not be accepted.**

The full proposal should provide much more detail than the preliminary proposal and describe plans for implementation and assessment. Descriptions should be clear and concise. Every effort should be made to update information that was provided in the preliminary proposal and to fully address issues raised in the preliminary proposal review. Full proposals should be comparable in scope and effort to that which was presented in the preliminary proposal.

### **Full Proposal Preparation Instructions**

Required proposal components and additions to or differences from the guidance in the NSF PAPPG are given below.

Select "Prepare New Full Proposal" in Research.gov. Search for and select this solicitation title in Step One of the Full Proposal wizard. Select "Center" as the proposal type. In the proposal details section, select "Single proposal (with or without sub-awards)." Separately submitted collaborative proposals will be returned without review.

**Senior/Key Personnel:** The full proposal must show the proposed Center Director as the PI. Other major participants, identified as Co-PIs or Other Senior/Key Personnel, may include the Managing Director, Education Coordinator, Diversity Coordinator, Knowledge Transfer Coordinator, Research Coordinator, Research Group Leaders, and any faculty and staff members whose research, education, knowledge transfer, or broadening participation efforts will be supported by the Center.

(1) Cover Sheet. For planning purposes, September 1, 2026 should be shown as the start date and the duration should be 60 months. Include the related preliminary proposal number.

(2) Project Summary The summary should be informative to persons working in the same or related fields, and understandable to a broad audience within the scientific domain. Provide a clear and concise description of the Center including mission and vision. Describe the multidisciplinary or disciplinary research focus, goals for education and broadening participation, and the knowledge transfer strategy of the Center. Articulate the potential legacy and national and global impact of the Center if funded.

(3) Project Description. The Project Description must contain only Sections (3.a) through (3.g) described below and cannot exceed 25 pages including tables and illustrations. Intellectual Merit and Broader Impacts: The intellectual merit and broader impacts of the STC must be addressed and described throughout the narrative as an integral part of the Project Description. Between Sections 3.b and 3.c include a separate header for Broader Impacts, as specified below.

(3.a) Problem Description and Rationale for Center Approach: Describe the grand challenge that engendered the proposal and the importance of specific aspects of this grand challenge that you aspire to solve. Include the timeliness of addressing this problem.

Explain the unique opportunities that an integrated center will provide and describe what will be achieved in the center mode that could not be achieved with group or individual support. Discuss why the STC program is particularly suited to support this effort. Discuss the long-term strategic goals of an integrated center. Describe the potential legacy and national and global impact of the proposed Center.

(3.b) Description of the Research Objectives of the Center: State the overall vision and long-range research goals of the integrated center. Describe the proposed research areas/themes and how they integrate with each other to realize the

Center's research vision. Provide 5-year timelines for the activities. Indicate the specific role of each partner organization or participant in each research topic/goal area. Provide a research plan with sufficient detail to allow assessment of the scientific merit and to justify the necessity for the center mode of operation.

Indicate the potential impact or expected significance the Center's research will have on the Nation's scientific and/or technological base. Include a description of current research activities and, if the proposed Center research is closely related to ongoing research at an existing Center (e.g., an STC, ERC, MRSEC, CCI or national laboratory), explain how the research activities of the proposed Center complement as well as differ from those of the existing Center(s). Explain how the proposed research relates to other state and national research capabilities as well as international programs in the proposed fields of research.

**BROADER IMPACTS** *(Please note: The Project Description must include a separate section header labeled Broader Impacts and the heading must be on its own line with no other text on that line. Include this section header between Sections 3.b and 3.c.)*

(3.c) Description of the Education and Human Resource Development Objectives of the Center: Present an education plan that describes how the Center will integrate research and education. Education activities should be based on evidence-based practices developed in the context of current education research and be monitored through a formal evaluation effort led by competent, independent evaluators.


Describe plans for the mentoring and professional development of students involved in Center activities. Describe plans for attracting and retaining high-quality students. Describe the process by which the education and human resource development goals will be established, used to guide the formal evaluation approaches, and modified during the award period, if needed. Name the lead organizations and key individuals involved with individual components, and explain the potential contributions and role of each in the education activity. Describe all proposed activities in sufficient detail to allow assessment of their intrinsic merit, potential effectiveness, and their anticipated contribution toward a highly competent and globally engaged technical and instructional workforce and educated citizenry.

(3.d) Description of the Broadening Participation Objectives of the Center: Describe the broadening participation objectives and outline strategies for achieving them. Describe plans for creating opportunities for all with the goal of increasing the participation of persons from the full spectrum of diverse talent that society has to offer, which includes underrepresented and under-served communities and institutions in all organizational levels of Center activities. Describe the contribution/role of partner institutions in developing strategies to increase outreach and engagement with the goal of broadening participation, indicate the role of students and faculty and how they will be integrated into Center activities, and explain how mentoring and other best practices will be used to provide a supportive environment for all project participants. Describe how the climate within the Center, across all participating groups, will be periodically assessed. Explain how progress will be measured and how strategies will be adapted, if necessary. Describe the proposed activities in sufficient detail to allow assessment of their intrinsic merit and potential effectiveness.

(3.e) Description of the Knowledge Transfer Objectives of the Center: Knowledge transfer involves the exchange of scientific and technical information between the Center and external non-academic stakeholders (such as industrial partners or public policy-makers) with the objective of applying that knowledge beyond Center participants, for the benefit of society. State the specific goals for knowledge transfer, the expected impact of the activities, and plans for monitoring knowledge-transfer impacts. Linkages between the Center and external communities should involve significant intellectual exchange and could involve, for example, mechanisms such as internships or novel use of cyberinfrastructure to enhance connections.

(3.f) Description of the Management Plan for the Research, Education, Broadening Participation, and Knowledge Transfer Activities of the Center: Present a management plan for the integrated Center including a diagram to explain the organizational relationships and reporting structure among the key areas of responsibility. Identify key members of the Center Management Team and explain their specific roles and areas of responsibility. The Center Director must have the appropriate experience to lead a diverse team to fulfill the vision of the Center. Key members of the Center Management Team must have experience and qualifications to administer their component of the Center. Identify responsibilities of each organization in the partnership. Explain the role of each key participant/component and explain the approach for integrating and managing all partners. Describe the processes to be used to prioritize Center activities; to select and

integrate research projects with one another and with other Center activities; to allocate funds and equipment across Center activities and among partners; and succession planning for the Center Director if needed. Although an External Advisory Committee is required for all Centers, potential members should not be approached or identified unless the Center is funded.

(3.g) Institutional Commitment to Promoting Inclusion. Using no more than one paragraph, describe indicators of institutional commitment to promoting inclusion of the full spectrum of diverse talent that society has to offer. For example, if one or more institutional members of the collaboration have a SEA Change Institutional Award (<https://seachange.aaas.org/> ) , the level of the award(s) could be provided; if an institution has or had an ADVANCE Institutional Transformation grant (<https://new.nsf.gov/funding/opportunities/advance-organizational-change-gender-equity-stem-academic-professions-advance>), its impact could be summarized if nothing similar applies, other institution-wide activities sponsored by the leadership of the institution could be described.

(4) Facilities, Equipment and Other Resources (1 page limit). Provide a synopsis of institutional resources that will be available to the Center (dedicated space, access to facilities and instrumentation, faculty and staff positions, including plans to make cluster hires if appropriate, access to programs that assist with curriculum development or broadening participation, or other institutional programs that could provide support to the STC). In order for NSF and its reviewers to assess the scope of a proposed project, all resources (including those from partner organizations) available to the project, must be described in this section. Note that inclusion of voluntary, committed cost sharing is prohibited. The description should be narrative in nature and must not include any quantifiable financial information.

(5) Budget and Budget Justification. Provide a budget for each of the five years. The proposed budget should be consistent with the needs and complexity of the proposed activity. The budget and budget justification should reflect start-up activities at the commencement of the Center activities. Funds allocated for research, education, broadening participation, and knowledge transfer areas must be discernible. Funds also should be included for attendance at yearly or more frequent cross-Center meetings.

Submit a separate budget and budget justification (2 page limit) for each participating organization in cases where a sub-award exceeds \$100,000 per year. Identify items of equipment costing more than \$10,000. Full justification for the latter is required. Individual graduate students may not be supported for a period in excess of five years.

NSF will not provide salary support for scientists, engineers, or educators employed by Federal agencies or Federally Funded Research and Development Centers that are not sponsored by NSF. For participants at foreign organizations, NSF will consider support only for the U.S. portion of the collaborative projects involving U.S. and foreign organizations.

(6) References Cited. This section must not exceed five pages.

(7) Senior/Key Personnel Documents

In accordance with the guidance in the PAPPG, the following information must be provided for all individuals designated as Senior/Key Personnel.

- Biographical Sketch
- Current and Pending (Other) Support
- Collaborators & Other Affiliations Information
- Synergistic Activities

#### **Special Information and Required Supplementary Documents (Sections 8-11):**

In addition to the requirements contained in the PAPPG, the following items must be included as Supplementary Documents.

(8.a.) Partner Organizations and (8.b.) Project Personnel. The list of Partner Organizations and Project Personnel that were required in the preliminary proposal must be updated to reflect any changes occurring since the time of preliminary proposal submission.

(9) Ethics Plan (1 page limit). Provide a clear statement of the proposed Center's policies on ethics training, responsible conduct of research, and intellectual property rights. Discussion should address the nature of the research, methodologies used, ownership of research and ideas, and roles and responsibilities regarding intellectual property. A program of training in ethics and responsible conduct of research within the cross-disciplinary and multi-organizational context of the Center, for all Center and sub-awardee staff, including faculty, visiting faculty, industrial fellows, postdoctoral researchers, graduate and undergraduate students is required. Training topics should include the nature of the research, methodologies used, ownership of research and ideas, and roles and responsibilities regarding intellectual property, and civil treatment of colleagues. If a proposal is selected for a site visit, a more detailed description of the lead institution's official policy will be required.

(10) Shared Experimental Facilities (2 page limit). Where appropriate, describe the shared facilities to be established, including specific major research instrumentation, and plans for the development of new instrumentation. Distinguish between existing facilities/instrumentation (and their location) and any that will be developed by the Center.

The following elements should be addressed in this section:

- maintenance and operation of STC-related facilities, including assurance of organizational commitments/support;
- mechanisms to deal with potential risk;
- availability of sufficient infrastructure and technical expertise to ensure effective usage of any major instruments;
- availability of appropriate technical expertise to design and construct new instruments if proposed; and provisions for user fees and plans for ensuring shared access by all partners and outside users.

(11) Data Management and Sharing Plan. This document should describe how the proposal conforms to NSF policy on the dissemination and sharing of research results, which provides that investigators are expected to share with other researchers, at no more than incremental cost and within a reasonable amount of time, the primary data, samples, physical collections, software, curriculum materials, and other supporting materials created or gathered in the course of work under NSF grants. The following items should be included in this subsection:

- the types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project;
- the standards to be used for data and meta-data format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);
- policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
- policies and provisions for re-use, re-distribution, and the production of derivatives; and
- plans for archiving data, samples, and other research products, and for preservation of access.

#### **Single Copy Documents (Optional)**

- List of suggested reviewers or reviewers not to include (with a brief explanation or justification for why the reviewer should be excluded);
- Identification of proprietary or privileged information (if applicable).

Full proposals containing items other than those described above will be returned without review.

#### **B. Budgetary Information**

##### **Cost Sharing:**

Inclusion of voluntary committed cost sharing is prohibited.

**Indirect Cost (F&A) Limitations:** Not applicable.



### **Budget Preparation Instructions:**

Proposed STC annual budgets may range up to \$6 million per year of NSF support. Full proposals above this range will be ineligible and will not be reviewed or considered for support. The core budget for the Center is expected to include support for all research, education, broadening participation, and knowledge transfer activities including, if proposed, those for undergraduate students and for teachers. Inclusion of voluntary committed cost sharing is prohibited.

### **The following information applies only for those STC proposals that are relevant to the Office of Polar Programs in the Geosciences Directorate:**

The Office of Polar Programs (OPP) strongly encourages STC proposals related to all aspects of polar research supported by the Foundation. For proposals requiring access to the polar regions or polar logistical support, investigators must contact appropriate OPP program managers for guidance regarding information needed to assess logistical support requirements for their submission. This should be done during proposal development.

For proposals requiring access to the Arctic, contact Kate Ruck ([kruck@nsf.gov](mailto:kruck@nsf.gov)). For proposals requesting Arctic Program vessel access contact Frank Rack ([frack@nsf.gov](mailto:frack@nsf.gov)). Additional information on Arctic field work requirements can be found in the OPP Arctic Research Opportunities (<https://new.nsf.gov/funding/opportunities/arctic-research-opportunities>). NSF has instituted a hiatus for new USAP-supported field work on the Antarctic continent ([https://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=309388&org=OPP](https://www.nsf.gov/news/news_summ.jsp?cntn_id=309388&org=OPP)).

### **C. Due Dates**

- **Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. submitting organization's local time):

November 20, 2024

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

June 02, 2025

### **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/ProposalPreparation)

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

For Research.gov user support, call the Research.gov Help Desk at 1-800-381-1532 or e-mail [rgov@nsf.gov](mailto:rgov@nsf.gov).

The Research.gov Help Desk answers general technical questions related to the use of the Research.gov system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

#### **For Proposals Submitted Via Grants.gov:**

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources web page: <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](mailto:support@grants.gov). The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

**Submitting the Proposal:** Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding

opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to Research.gov for further processing.

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

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

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

## **VI. NSF Proposal Processing And Review Procedures**

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

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

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

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

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science

and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

## **A. Merit Review Principles and Criteria**

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

### **1. Merit Review Principles**

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

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

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

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

### **2. Merit Review Criteria**

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

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

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful.

These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

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

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

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

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

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

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

Preliminary proposals and full proposals will be reviewed using the above criteria. When considering the intellectual merit and broader impacts criteria, reviewers will also be asked to address the following STC-specific questions during the various stages of the competition:

(1) Preliminary Proposals. Reviewers will be asked to consider the vision and potential impact of the research proposed, along with the need for the center funding mechanism. Reviewers will be asked to evaluate and comment on the following:

- *Rationale for an STC*, including questions: Is the vision for the project compelling and would such a center have potential to transform our foundational scientific understanding? If so, is an STC the appropriate vehicle? Why is an STC investment warranted at this time? Are the anticipated scientific and societal legacies substantial?
- *Research plan*, including questions: Are the plans for research appropriately ambitious for an STC? Does the preliminary proposal make a case for the feasibility of significant progress over the next five years? Are technical challenges and potential bottlenecks addressed in the research plan?
- *Partnerships and Participants*, including questions: Is the team of partner organizations and personnel assembled for the proposed Center appropriate, essential and consistent with the solicitation? Is the role of each participant

clear? Does the partnership have unique strengths?

- Integration Strategies, including questions: Are the leadership and management strategies promoting a Center culture? Do the education, knowledge transfer and broadening participation plans support the goals of the Center?

(2) Full Proposals. In addition to the review criteria that will be addressed in reviewing preliminary proposals, reviewers will be asked to consider the integrative nature of the proposed Center. Questions to be considered include:

- Are the research, education, knowledge transfer, and broadening participation efforts strategically embedded and integrated in the proposed Center?
- Are the partner organizations and participants meaningfully integrated into a diverse Center that is more than just the sum of the parts?
- Does the proposal include a vision and plan for leadership in increasing outreach and engagement to broaden the participation of underrepresented groups and under-resourced institutions and does it articulate a credible commitment to broadening participation as a means of achieving its overall goals?
- Are the higher educational activities innovative with potential for measurable impacts and do they contribute to the unifying mission of the proposed Center?
- Does the proposal include a promising plan to promote the transfer of knowledge with external stakeholders (such as industrial partners, public policy makers, or international organizations) through the meaningful exchange of scientific and technical information?
- Does the proposed Center management have the vision, experience, and capacity to manage a complex, multi-faceted, and innovative enterprise that integrates research, education, broadening participation, and knowledge transfer?
- Are the institutional and other commitments appropriate to carry out the proposed research?

(3) Site Visits. The full scope of questions applicable for prior stages in the competition will be within the purview of the site visit team. The site visit team will give special consideration to the management and budget of the proposed STC and any outstanding issues that were raised during previous stages of the review process.

- Is the budget appropriate for the scale, scope, and complexity of the proposed Center's activities?
- Does the proposed Center management demonstrate the vision, experience, and capacity to manage a complex, multi-faceted, and innovative enterprise that integrates research, education, broadening participation, and knowledge transfer?
- Is the proposed management plan likely to be effective? Are there appropriate mechanisms to identify and support emerging opportunities and terminate mature or ineffective activities across all of the proposed Center's areas or themes? Are there appropriate mechanisms to enable and manage high-risk, high-reward and/or potentially transformative efforts across all activities in the proposed Center? Will the management approach ensure a Center culture that fosters exploring emerging research directions that are scientifically risky?
- Is the role of the External Advisory Committee clearly and appropriately defined?
- Is there an adequate succession plan for the leadership of the Center?
- Are intellectual property issues adequately addressed?

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

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

Multidisciplinary preproposal panels

Ad hoc reviews of invited full proposals, full proposal panel

site visits of recommended proposals by the full proposal panel

Blue ribbon/summary panel

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 letter, 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 letter; (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 letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

\*These documents may be accessed electronically on NSF's Website at [https://www.nsf.gov/awards/managing/award\\_conditions.jsp?org=NSF](https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov).

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide (AAG)* Chapter II, available electronically on the NSF Website at [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=aag](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag).

### **Special Award Conditions:**

STC awards are made in the form of cooperative agreements. The STC cooperative agreements will have an extensive section of Special Conditions relating to the period of performance, statement of work, awardee responsibilities, NSF responsibilities, joint NSF-awardee responsibilities, funding and funding schedule, reporting requirements, key personnel, and other conditions. NSF has responsibility for providing general oversight and monitoring of STCs to help assure effective performance and administration, as well as facilitating any coordination among the STCs as necessary to further the objectives of the STC program. Within the first 90 days of the Award, a retreat of the Center's key personnel to address strategic planning of the STC will be required.

### **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](https://www.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](https://www.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](https://www.research.gov). This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

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

NSF conducts annual site visits to monitor and evaluate the progress of individual Centers. Centers will be required to submit annual project reports on progress and plans, which will be used as a basis for performance review and determining the level of continued funding. To support this review and the management of a Center, STCs will also be required to develop a set of management and performance indicators for submission annually to NSF via an NSF evaluation technical assistance contractor. Part of this reporting may take the form of a database that will be owned by the institution and eventually made available to an evaluation contractor. This database will capture specific information to demonstrate progress towards achieving the goals of the program. Such reporting requirements may be included in the cooperative agreement which is binding between the institution of higher education and the NSF.

## **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:

- Dragana Brzakovic, telephone: (703) 292-5033, email: [stc2026@nsf.gov](mailto:stc2026@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](mailto:rgov@nsf.gov)

For questions relating to Grants.gov contact:

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

## IX. Other Information

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

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

### About The National Science Foundation

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

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

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

*Facilitation Awards for Scientists and Engineers with Disabilities* (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](mailto:nsfpubs@nsf.gov)
  - or telephone: (703) 292-8134
- **To Locate NSF Employees:** (703) 292-5111

## Privacy Act And Public Burden Statements

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

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

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

[Vulnerability disclosure](#) | [Inspector General](#) | [Privacy](#) | [FOIA](#) | [No FEAR Act](#) | [USA.gov](#) | [Accessibility](#) |

[Plain language](#) |



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