

Innovative Technology Experiences for Students and Teachers (ITEST) Resource Center

PROGRAM SOLICITATION

NSF 24-500



National Science Foundation
Directorate for STEM Education
Research on Learning in Formal and Informal Settings

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

March 06, 2024

IMPORTANT INFORMATION AND REVISION NOTES

1. This solicitation is for ITEST Resource Center proposals only.
2. Full proposals involving multiple organizations may be submitted as separately submitted collaborative proposals, or as a single proposal from the lead organization with other collaborating organizations included as subawardees.
3. The project description may be up to 20 pages.
4. One award will be made as a cooperative agreement.

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:

Innovative Technology Experiences for Students and Teachers Resource Center (ITEST RC)

Synopsis of Program:

The Innovative Technology Experiences for Students and Teachers (ITEST) program is an applied research and development program that seeks to actualize a diverse future STEM (science, technology, engineering, and mathematics) and ICT (information and communication technologies) workforce that is prepared to meet pressing local, societal, and global challenges. Because STEM and ICT careers increasingly rely on technologies and computing, the ITEST program funds projects that engage youth, from pre-kindergarten through high school, and pre-K-12 educators in equitable, innovative technology learning and education experiences within and across STEM disciplines in formal or informal settings. These projects build youths' interest and knowledge in STEM careers, and they prioritize the full inclusion of all groups to include those that have been underrepresented, under-served, or excluded from STEM educational opportunities. This ensures that NSF is better postured to leverage the full spectrum of diverse talent across the country.

This solicitation calls for a Resource Center for the ITEST program. The Resource Center will support diverse, multi-sector stakeholders in actualizing the three pillars of ITEST: (1) strategies for equity in STEM education, (2) partnerships for career and workforce preparation, and (3) innovative use of technologies in teaching and learning. It is expected that this Resource Center will facilitate individual and collective dialogue, reflection, and action relative to these pillars, while supporting stakeholders in the conceptualization, actualization, and communication of ITEST projects.

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.

- The ITEST Program, telephone: (703) 292-8620, email: DRLITEST@nsf.gov

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

- 47.076 --- STEM Education

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1

In FY2024, NSF anticipates making one ITEST Resource Center award with a maximum duration of five years, contingent on availability of funds and receipt of competitive proposals. The total amount of NSF's investment in the Resource Center will depend upon the needs, plans, and opportunities offered by the Resource Center, as well as the availability of NSF funds.

Anticipated Funding Amount: \$5,000,000

One award with a five-year duration.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.
- Non-profit, non-academic organizations: Independent museums, observatories, research laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- For-profit organizations: U.S.-based commercial organizations, including small businesses, with strong capabilities in scientific or engineering research or education and a passion for innovation.
- State and Local Governments: State educational offices or organizations and local school districts.
- Tribal Governments: The governing body of any Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Indian Tribe List Act of 1994 (25 U.S.C. 479a, et seq.)

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits on the number of proposals per organization.

NOTE: Proposals involving multiple organizations are highly encouraged. These proposals may be submitted from a lead organization with other collaborating organizations included as subawardees as described in PAPPG Chapter II.E.3.a. These proposals may also be submitted as collaborative proposals from multiple organizations as described in PAPPG Chapter II.E.3.b. The proposal should specify how each collaborating organization will provide unique expertise, organizational capacity, and other resources that will, in aggregate, afford a comprehensive approach to partnering together to meet the needs of the ITEST program with respect to capacity-building, outreach, research, portfolio analysis, and communication.

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

There are no restrictions or limits.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required

- **Full Proposals:**

- Full Proposals submitted via Research.gov: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
- Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.

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

Not Applicable

- **Other Budgetary Limitations:**

Not Applicable

C. Due Dates

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

March 06, 2024

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

Standard NSF award conditions apply.

Reporting Requirements:

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

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I. INTRODUCTION

About the Innovative Technology Experiences for Students and Teachers (ITEST) Program

The ITEST program is situated within the Division of Research on Learning in Formal and Informal Settings (DRL). DRL's mission is to cultivate and catalyze fundamental and applied research and development (R&D) to improve the learning of science, technology, engineering, and mathematics for the nation.

The ITEST Resource Center will support the ITEST program in its goals to cultivate a diverse domestic US STEM and ICT workforce through providing equitable innovative technology learning and education experiences for pre-K through high school learners across a range of formal and informal settings. The benefits of a diverse US workforce are many. They include but are not limited to increased economic prosperity and national security of the United States; the acceleration of STEM innovation through the infusion of diverse perspectives; the advancement of the economic well-being of people who have been excluded from STEM educational opportunities; and a future STEM workforce that is better equipped to ensure that all people in society have increased opportunities to benefit from advancements in STEM industries.

ITEST seeks projects that advance equitable outcomes and learning experiences for youth and communities that have been excluded, under-served, or underrepresented in educational opportunities and careers in STEM fields. Equity may include approaches to creating STEM learning environments that acknowledge the rightful presence, contributions, interests, and strengths of all who can participate in STEM pathways. Equity may also include enhanced learning opportunities, materials, or technologies for educators in settings that are under-resourced. Additionally, equity may include educational approaches that equip the future STEM and ICT workforce to transform STEM careers and workplaces, such that they more fully consider the well-being of all people. Finally, equity may include many other dimensions and approaches as defined by youth, their educators, their families, their communities, and/or relevant theoretical and empirical literature.

As part of its commitment to advancing equity, collectively, ITEST projects are expected to engage all segments of society, including youth and groups who are historically or currently under-served or underrepresented in STEM.

The ITEST program recognizes that a core mechanism for advancing equity relies on partnerships that connect stakeholders who each bring unique perspectives, practices, resources, and strengths to bear on shared goals for equity relative to STEM learning experiences that inspire and prepare youth to pursue STEM and ICT careers. To this end, ITEST projects should include partners such as community- or family-based organizations, formal or informal learning organizations, industries, non-profit organizations, community colleges, and others who work together to achieve the transformation needed to provide equitable, technology-rich learning environments that prepare youth for the STEM workforce of the future while simultaneously fostering the transformation of this workforce.

II. PROGRAM DESCRIPTION

This solicitation calls for an ITEST Resource Center that is visionary in actualizing equity in STEM learning environments that inspire and prepare youth to pursue careers in the STEM workforce of the future. The Resource Center leadership team will facilitate dialogue across stakeholders as it actively elicits new perspectives on potentially transformative approaches to workforce development among communities and organizations that have been overlooked or under-consulted in this work. This team should reflect a commitment to equity and should include thought leaders with demonstrated expertise, experience, and research regarding equity in STEM learning and teaching.

The ITEST Resource Center will engage individuals and organizations who seek to expand their capacity to design, carry out, and communicate research on equitable, innovative technology experiences for all pre-k through 12th grade learners and their teachers, which will prepare the next generation of the STEM workforce to meet global and societal challenges of the future. These audiences include but are not limited to:

1. Current **ITEST Principal Investigators (PIs) and project partners** on ITEST-funded awards.
2. **Prospective ITEST PIs and project partners** who seek to develop competitive ITEST proposals and enact their projects through equitable partnerships and practices. Prospective PIs include those who are currently unaware of the ITEST program, but whose perspectives on STEM teaching and learning have the potential to transform the STEM workforce of the future and preparation for this workforce.
3. **Other innovators who seek to use equity- and evidence-based approaches to innovative technology experiences**, such as educators in formal and informal settings; community-based organizations; professional networks and organizations; industry stakeholders; policymakers; and STEM educational research communities.

The Resource Center for the ITEST program is invited to envision, design, and develop innovative and promising approaches to providing the following four functions:

1. **Cultivate a nationwide, multi-sector community dedicated to promoting equity in STEM education among pre-K-12 youth, and their educators, in ways that inspire and prepare youth to pursue future career opportunities in STEM.**
 - a. Strengthen networking, partnerships, and synergies among organizations, institutions, networks, and/or industries with distinct

- strengths, resources, and areas of expertise. These networks should strengthen capacity of the field to deliver equitable, innovative technology experiences that prepare the future STEM workforce.
- b. Strengthen community-building and capacity among STEM educational researchers and practitioners, and their partners, to drive change relative to STEM education that prepares youth for future STEM careers.
 - c. Enlist the interest and support of stakeholders and decision-makers, including industries, creators of educational technologies and media, policymakers, administrators, educational researchers, educators in formal and informal settings, and other sectors to amplify the impact of efforts to advance equity through innovative technology experiences for youth in formal and informal settings.
2. **Raise the visibility and impact of equity-based research and practice in STEM education, which has the demonstrated potential to foster a diverse STEM workforce of the future.**
 - a. Develop and promote compelling communications about equity-based educational approaches that increase youths' interest in, and preparation for, STEM careers of the future.
 - b. Provide ITEST recipients (PIs and project partners) with opportunities to highlight their work to a broad range of stakeholders.
 - c. Synthesize and disseminate ITEST projects' findings nationally to inform and influence stakeholders. This includes conducting comprehensive analyses of the ITEST portfolio for internal and external stakeholders annually and as needed. It also includes enacting a comprehensive dissemination plan to communicate ITEST outcomes and resources to formal and informal STEM education professional organizations, policymakers, industry stakeholders, and STEM educational researchers.
 3. **Support ITEST PIs, prospective PIs, and partners in designing and researching STEM learning environments that contribute to equitable or expansive workforce preparation efforts and outcomes.**
 - a. Provide ITEST recipients (PIs and project partners) with opportunities to deepen connections across projects and to participate in continuous learning, reflection, and action, with a specific focus on equitable educational practices that have the potential to transform the STEM workforce of the future.
 - b. Provide assistance relative to the design and enactment of equitable research and evaluation methods that will build the collective evidence base relative to equitable STEM learning environments.
 - c. Provide technical assistance to prospective ITEST PIs and prospective partners, with emphases on developing competitive proposals that enact equity in their preparation and project design. The Resource Center should envision and enact a plan to provide technical assistance in proposal development to organizations that are currently under-served by the ITEST program, including those in EPSCoR states and rural areas, through regional workshops and other formats. Under-served organizations also include cultural institutions, community colleges, and Minority-Serving Institutions (as listed and defined by the US Department of Education list of MSIs: <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>), among others.
 4. **Promote equitable practices that support the ITEST program.**
 - a. Provide visibility and support for the ITEST program, its funding calls, and other NSF funding opportunities and policies relevant to the ITEST program. The Resource Center will provide enhanced supports for groups, communities, and organizations that seek greater participation in vision-setting around the STEM workforce of the future, and the educational opportunities in pre-K through 12th grade that can help to make this workforce a reality.
 - b. Broaden participation in the ITEST PI community, such that it includes more people from diverse geographic regions, organizations, and communities. This includes those that are underrepresented or not-yet-represented in the ITEST portfolio. This postures NSF to leverage the full spectrum of diverse talent across society
 - c. Host biennial ITEST Awardee Meetings to share emerging findings and challenges with respect to equitable research and practice relative to innovative technology experiences for youth. The meetings will be organized in collaboration with NSF.
 - d. Host webinars and in-person workshops that support organizations and individuals in dialogue, reflection, and action relative to strategies for equity in STEM education, partnerships for career and workforce preparation, and innovative use of technologies in teaching and learning.

It is requested that one of the mechanisms to fulfill these functions should be a virtual infrastructure, which may include elements such as a website, a digital resource repository, social media, and/or other means to connect stakeholders to resources, the ITEST program, and one another. Outside of this request, the ITEST program has intentionally left unspecified the mechanisms for fulfilling these functions in order to encourage creative approaches driven by proposers.

III. AWARD INFORMATION

NSF anticipates making one ITEST Resource Center award with a maximum duration of five years, contingent on availability of funds and receipt of competitive proposals. The award will be made as a Cooperative Agreement. The total amount of NSF's investment in the Resource Center will depend upon the needs, plans, and opportunities offered by the Resource Center, as well as the availability of NSF funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.
- Non-profit, non-academic organizations: Independent museums, observatories, research laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- For-profit organizations: U.S.-based commercial organizations, including small businesses, with strong capabilities in scientific or engineering research or education and a passion for innovation.
- State and Local Governments: State educational offices or organizations and local school districts.
- Tribal Governments: The governing body of any Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Indian Tribe List Act of 1994 (25 U.S.C. 479a, et seq.)

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits on the number of proposals per organization.

NOTE: Proposals involving multiple organizations are highly encouraged. These proposals may be submitted from a lead organization with other collaborating organizations included as subawardees as described in PAPPG Chapter II.E.3.a. These proposals may also be submitted as collaborative proposals from multiple organizations as described in PAPPG Chapter II.E.3.b. The proposal should specify how each collaborating organization will provide unique expertise, organizational capacity, and other resources that will, in aggregate, afford a comprehensive approach to partnering together to meet the needs of the ITEST program with respect to capacity-building, outreach, research, portfolio analysis, and communication.

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

There are no restrictions or limits.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

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

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

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

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

The following instructions supplement guidelines in the *NSF PAPPG* and *NSF Grants.gov Application Guide*:

1. Title

Title of Proposed Project: The title of the proposed project must begin with "ITEST-RC".

2. Project Description

The project description is limited to 20 pages and must comply with all formatting requirements of the most current PAPPG. In addition to the requirements outlined in the NSF PAPPG, proposals should address the following elements in the project description.

a. Rationale and Activities

Proposers should define their vision for equity relative to the three pillars of ITEST: strategies for equity in STEM education, partnerships for career and workforce preparation, and innovative use of technologies in teaching and learning. They should present a theory of action, grounded in relevant empirical or theoretical literature, to illustrate how they will achieve this vision. This theory of action should connect with the four functions of the Resource Center by describing specific activities that align with these functions and connecting them with attainable outcomes. The description should have enough detail for reviewers to evaluate the quality and expected outcomes of the center.

b. Management Plan

This plan should describe how the project team will implement the Resource Center over a five-year period. This section should include descriptions of the ITEST Resource Center's staff positions, partners, and evaluator(s)/advisory board(s); expertise, roles and responsibilities of each; methods of coordination and collaboration between partners; and the time and effort each will devote to Center activities. This section should include a project timeline with milestones.

c. Evaluation Plan

The proposal should outline an evaluation plan that stems from the theory of action and includes both formative (or developmental) and summative components. The plan should lay out a schedule for annual review; identify external evaluator(s) (and possible additional advisory board(s)); and explain how evaluation activities map to the center's theory of action. Ongoing formative (developmental) evaluation should describe how data will be used to inform the Resource Center's approaches and decision-making and include management and performance indicators of progress for assessing the project's implementation processes and adaptations. The summative evaluation should assess the impact of the project activities and progress toward the center's overall goals and objectives. Consider consulting the American Evaluation Association website for more information about developmental evaluations, and the following NSF publication for formative and summative evaluation plans: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf02057.

3. Other Required Sections

Per guidance in the PAPPG, the Project Description must contain, as a separate section within the narrative, a section labeled "Broader Impacts." Proposers can decide where to include this section within the Project Description. The proposal must also include a section describing results from prior NSF support for the PI or co-PI, if applicable, as described in the PAPPG.

4. Budget and Budget Justification

Budgets should be prepared in accordance with the guidance in the PAPPG or NSF Grants.gov Application Guide and include up to five pages of budget justification. The budget justification should be in narrative form and include detailed explanations for each line item with budget resources listed in the budget. For proposals with subawards, each subaward must include a separate budget and budget justification of no more than five pages.

5. Supplementary Documentation

a. Data Management Plan

Proposals must include a Supplementary Document of no more than two pages labeled "Data Management Plan." This supplementary document should describe how the proposal will conform to NSF policy on data collection, storage, and sharing, as well as the dissemination and sharing of findings and products. The Data Management Plan should support the sharing of data, products, and methods in a manner that others can understand, validate, and replicate findings (see Chapter II.D.2.i of the PAPPG for full policy implementation). All data collected by the Center must also align with the "Data Management for NSF EHR Directorate Proposals and Awards" guidance, which may be found here: <https://www.nsf.gov/bfa/dias/policy/dmpdocs/ehr.pdf>.

For additional information on the NSF Data Management Plan Requirements, see: <https://www.nsf.gov/bfa/dias/policy/dmp.jsp>. DMPs will be reviewed by external merit reviewers and NSF program directors and should be written with sufficient clarity and detail to support proposal processing and the merit review process. Generic Data Management Plans should be avoided.

b. Postdoctoral Researcher Mentoring Plan

Proposals that request funding to support postdoctoral researchers must develop a comprehensive mentoring plan for the postdoctoral researcher(s). The plan should be uploaded under "Mentoring Plan" in the supplementary documentation section and include a description of the mentoring activities that will be provided for such individuals. Mentoring activities provided to postdoctoral researchers supported on the project will be evaluated under the Intellectual Merit and Broader Impacts review criteria. For additional information regarding postdoctoral researcher mentoring plans, see Chapter II.D.2.i of the PAPPG.

c. Letters of Collaboration

Letters of Collaboration from project partners may be included. A description of Letters of Collaboration, and suggested text is included in the NSF PAPPG. Letters of support from persons endorsing the project but not making a substantial commitment to the project are not allowed.

d. List of Project Personnel

In addition to guidance provided in the PAPPG on required Special Information and Supplementary Documents, please provide a list of all project personnel in the Supplementary Document section. Provide current, accurate information for all personnel and organizations involved in the project. NSF staff will use this information in the merit review process to manage reviewer selection. The list must include all PIs, co-PIs, Senior Personnel, paid/unpaid Consultants or Collaborators, Subawardees, Postdocs, project-level advisory committee members, and writers of letters of collaboration. This list should be numbered and include in this order Full name, Organization(s), and Role in the project, with each item separated by a semi-colon. Each person listed should start a new numbered line.

e. Appendix

Not permitted. The 20 pages of the Project Description should contain all the information needed to describe the project. Proposals submitted with an Appendix will be returned without review.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

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

March 06, 2024

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For Research.gov user support, call the Research.gov Help Desk at 1-800-381-1532 or e-mail rgov@nsf.gov. The Research.gov Help Desk answers general technical questions related to the use of the Research.gov system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

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

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

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

1. To what extent and in what ways are the proposed mechanisms for collaboration across organizations, institutions, and stakeholders likely to contribute to the successful achievement of the four functions of an ITEST Resource Center?

2. To what extent and in what ways are the proposed activities likely to broaden participation relative to equitable and innovative technology learning and education for pre-K through 12th grade learners, and their later participation in the STEM workforce?

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 Reverse Site Review.

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

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

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

Administrative and National Policy Requirements

Build America, Buy America

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

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

C. Reporting Requirements

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

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

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

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

The ITEST Resource Center will be required to submit annual and evaluation reports on progress and plans, which will be used as a basis for performance review and determining the obligation of cooperative agreement increments. Annual reviews of progress will include a set of management and performance indicators and will also take the form of site visit(s) or reverse site visit(s).

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:

- The ITEST Program, telephone: (703) 292-8620, email: DRLITEST@nsf.gov

For questions related to the use of NSF systems contact:

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

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended

(42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

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

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

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

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

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

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

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

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (703) 292-5111
(NSF Information Center):
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
Send an e-mail to: nsfpubs@nsf.gov
or telephone: (703) 292-8134
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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