

NSF 24-587: Research on the Science and Technology Enterprise: Indicators, Statistics, and Methods

Program Solicitation

Document Information

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[View the program page](#)



National Science Foundation

Directorate for Social, Behavioral and Economic Sciences
National Center for Science and Engineering Statistics

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

January 21, 2025

Third Tuesday in January, Annually Thereafter

June 17, 2025

Third Tuesday in June, Annually Thereafter



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

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:

Research on the Science and Technology Enterprise: Indicators, Statistics, and Methods (NCSES S&T)

Synopsis of Program:

The National Center for Science and Engineering Statistics (NCSES) of the National Science Foundation (NSF) is one of the thirteen principal federal statistical agencies within the United States. It is responsible for the collection, acquisition, analysis, reporting and dissemination of objective, statistical data related to the science and technology (S&T) enterprise in the United States and other nations that is relevant and useful to practitioners, researchers, policymakers and the public. NCSES uses this information to prepare a number of statistical data reports including *Women, Minorities and Persons with Disabilities in Science and Engineering* and the National Science Board's biennial report, *Science and Engineering (S&E) Indicators*.

The Center would like to enhance its efforts to support analytic and methodological research in support of its surveys as well as promote the education and training of researchers in the use of large-scale nationally representative datasets. NCSES welcomes efforts by the research community to use NCSES or other data to conduct research on the S&T enterprise, develop improved survey methodologies that could benefit NCSES surveys, explore alternate data sources that could supplement NCSES data, create and improve indicators of S&T activities and resources, strengthen methodologies to analyze S&T statistical data, and explore innovative ways to communicate S&T statistics. To that end, NCSES invites proposals for individual or multi-investigator research projects, doctoral dissertation improvement awards, conferences, experimental research, survey research and data collection, and dissemination projects under its program for Research on the Science and Technology Enterprise: Indicators, Statistics, and Methods (NCSES S&T).

Broadening Participation In Stem:

NSF recognizes the unique lived experiences of individuals from communities that are underrepresented and/or underserved 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 underserved 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 underserved 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.

- Sharon A. Boivin, telephone: (703) 292-4263, email: sboivin@nsf.gov

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

- 47.075 --- Social Behavioral and Economic Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 5 to 10

Based on the quality of proposals and the availability of funds, NSF expects to make 5 to 10 awards each year.

Anticipated Funding Amount: \$1,500,000

subject to the availability of funds

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- **Standard research proposals:**
 - 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.
 - Tribal Nations: An American Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges as a federally recognized tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. §§ 5130-5131.

Doctoral Dissertation Research Improvement Grant proposals: Doctoral Degree granting IHEs accredited in, and having a campus located in, the US acting on behalf of their faculty members.

Who May Serve as PI:

Standard research proposals: No special restrictions or limits.

Doctoral Dissertation Research Improvement Grant proposals: The dissertation advisor must be listed as the Principal Investigator and the student must be listed as the co-Principal Investigator.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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. submitting organization's local time):

January 21, 2025

Third Tuesday in January, Annually Thereafter

June 17, 2025

Third Tuesday in June, Annually Thereafter

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

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

Reporting Requirements:

Standard NSF reporting requirements apply.

I. Introduction

The National Center for Science and Engineering Statistics (NCSES) of the National Science Foundation (NSF) is responsible for the collection, acquisition, analysis, reporting and dissemination of objective, statistical data related to the science and technology (S&T) enterprise in the United States and other nations. This information should be relevant and useful to practitioners, researchers, policymakers and the public. NCSES uses this information to prepare a number of statistical data reports as well as analytical reports including *Women, Minorities and Persons with Disabilities in Science and Engineering* and the National Science Board's biennial report, *Science and Engineering (S&E) Indicators*.

The America COMPETES Reauthorization Act codifies the role of NCSES in supporting research using the data that it collects and its role in research methodologies related to its work. The legislation specifies the responsibilities of NCSES in supporting the education and training of researchers who use large-scale data sets, such as the ones NCSES now collects. The following activities form the core of NCSES work:

- The collection, acquisition, analysis, reporting, and dissemination of statistical data related to the United States and other nations;
- Support of research that uses NCSES data;
- Methodological research in areas related to its work; and

- Education and training of researchers in the use of large-scale nationally representative data sets.

II. Program Description

NCSES welcomes proposals for research, conferences, and studies to advance the understanding of the S&T enterprise and encourage development of methods that will improve the quality of our data. Research could include: improved approaches to indicator construction and presentation, new S&T indicator development, strengthening of data collection methodologies and privacy protection to improve surveys that collect S&T data, investigations of alternate data sources to study S&T topics, analyses to inform STEM education and workforce policy, and innovations in the communication of S&T statistics. NCSES encourages proposals that analyze NCSES data or NCSES data in conjunction with those from other sources but does not limit the work to the analysis of the data it collects.

A. AREAS OF INTEREST

Potential topics for consideration include but are not limited to:

- Improving analytical techniques to produce better indicators of issues related to: (1) the education and retention of scientists and engineers including minorities, women, or persons with disabilities as described in the NCSES publication [Diversity and STEM: Women, Minorities, and Persons with Disabilities 2023 | NSF - National Science Foundation](#), (2) the demand, supply, career pathways, and/or characteristics of science and engineering personnel, including those without bachelor's degrees (3) outcomes and impacts of research and development (R&D) expenditures in various sectors, countries, and fields including emerging science and technology fields, (4) estimates of current and near-term future S&T resources; and (5) measures of U.S. competitiveness in S&T.
- Developing new and/or improved methods of measuring the inputs, outputs, interactions, and social or economic impacts of S&T activities. These methods could involve the use of administrative records, social media, or novel data extraction methods.
- Developing new data, analyses, and/or indicators of the globalization of science, engineering, and technology, as well as analyses leading to a better understanding of the changing global economy. This could include: international comparisons of S&T capabilities and activities, indicators of international education and mobility of scientists and engineers, and foreign investment in S&T activities.
- Improving data collection methodologies for S&T surveys and censuses, including those conducted by NCSES. Such studies could research improvements in the target population, sample frame, and sample design, focusing on coverage and sampling error. Also included are developments of new data collection techniques and operational efficiencies such as adaptive survey design and passive data collection. Studies focused on the respondent experience and reduction in respondent burden such as modular survey design are also relevant.
- Improving analysis and data processing methodologies for NCSES data by researching topics such as imputation techniques, privacy protections, or data consistency with related surveys or administrative data. This research could also involve investigations of linkage of alternate data sources to supplement NCSES data and reporting.
- Pursuing innovations in the dissemination of S&T statistics to encourage communication of the information in a timely and user-friendly fashion. This could include interactive visualizations, studies of user needs, and new reporting formats for indicators.

B. DATA AVAILABILITY

NCSES encourages proposers to use NCSES data for their research. NCSES conducts the following surveys for which data are available:

STEM Education

[Survey of Graduate Students and Postdoctorates in Science and Engineering \(GSS\)](#)

[Survey of Earned Doctorates \(SED\)](#)

Science and Engineering Workforce

[Early Career Doctorates Survey \(ECDS\)](#)

[Survey of Doctorate Recipients \(SDR\)](#)

[National Survey of College Graduates \(NSCG\)](#)

[National Training, Education, and Workforce Survey \(NTEWS\)](#)

[Survey of Postdocs at Federally Funded Research and Development Centers](#)

Government Funding for Science and Engineering

[Survey of Federal Funds for Research and Development](#)

[Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions](#)

[Survey of State Research and Development Expenditures](#)

Higher Education Research and Development

[Higher Education Research and Development Survey \(HERD\)](#)

[Survey of Science and Engineering Research Facilities](#)

Research and Development

[Annual Business Survey \(ABS\)](#)

[Business Enterprise Research and Development Survey \(BERD\)](#)

[Federal Facilities Research and Development Survey](#)

[FFRDS Research and Development Survey](#)

[Nonprofit Research Activities Survey \(NPRA\)](#)

For a broad overview of all of the surveys see: <https://www.nsf.gov/statistics/srvyoverview/overview.cfm>

To explore public use data, see: <https://ncesdata.nsf.gov/explorer>.

C. DATA ACQUISITION

If proposers expect to use existing datasets, the proposal should indicate what those datasets are and whether the proposer expects to be able to acquire the data. Some NCSES datasets do require special procedures to acquire data. Information about data access can be found here: [Explore Data | NSF - National Science Foundation](#).

Restricted Use Data Licensing

NCSES grants licenses to securely access restricted use microdata files under certain conditions. Licenses are only needed for microdata not available in [public use files](#).

Restricted use microdata licenses are available from NCSES for the following:

- Early Career Doctorate Survey (ECDS)
- National Survey of College Graduates (NSCG)
- National Survey of Recent College Graduates (NSRCG)

- Scientists and Engineers Statistical Data System (SESTAT) Integrated File
- Survey of Doctorate Recipients (SDR)/SDR Longitudinal (LSDR)
- Survey of Earned Doctorates (SED)/Doctorate Record File (DRF)

The process of applying for access to NCSES data is evolving. The [Foundations for Evidence-Based Policymaking Act of 2018](#) called for the federal government to establish a standard application process (SAP) through which agencies; the Congressional Budget Office; state, local, and tribal governments; researchers; and other individuals, as appropriate, may apply for access to restricted use microdata. In response, the federal statistical system developed the SAP Portal at www.researchdatagov.org.

The SAP Portal is a Web-based metadata catalog and application portal that serves as the “front door” to apply for restricted use data from any of the [16 principal federal statistical agencies and units](#) for evidence building purposes. To learn more about the SAP, please visit the [SAP overview](#) Web page.

The SAP Portal provides prospective applicants with a comprehensive metadata catalog for over 1,300 restricted use data assets from the federal statistical agencies and accepts applications requesting access to these assets. Users with questions about arrangements for use of restricted use data or questions about existing applications should contact NCSES directly at NCSES_Licensing@nsf.gov.

How to Request Access to Restricted Use Data from NCSES

Prior to beginning the restricted use application process, we encourage individuals to explore NCSES’s publicly available data products. NCSES makes data available through our online data tools, data tables, data profiles, and public use microdata files. For more information about all these publicly available options, please visit NCSES’s [Explore Data](#) Web page.

If an individual’s research or policy questions cannot be informed using publicly available data products, NCSES allows individuals employed at a U.S. based institution or organization the opportunity to apply for access, through the [SAP Portal](#), to restricted use data files for select statistical research projects at NCSES’s Secure Data Access Facility and through the Federal Statistical Research Data Centers. Below are the steps associated with requesting access to NCSES restricted use data.

1. Discover data: Explore the [SAP Portal](#) metadata catalog to identify available NCSES microdata to inform research and policy questions.
2. Submit an application: Submit a request for access to NCSES restricted use data through the [SAP Portal](#). The [Application Instruction Manual](#) provides step-by-step instructions to submit an application requesting access to restricted use data. The manual is available through the SAP Portal’s “Help” dropdown menu.
3. Receive an application determination: After an application is submitted through the SAP Portal, NCSES will review the application in adherence with the review criteria outlined in the [SAP policy](#). Applicants will receive an application determination notification through the SAP Portal.
4. Submit data security requirements: For approved applications, NCSES will contact the applicant to provide instructions on the data security requirements needed to gain access to the restricted use data. The completion and submission of the NCSES data security requirements will take place outside of the SAP Portal.
5. Obtain help: For questions about the data or the application process, please contact NCSES at NCSES_Licensing@nsf.gov.

Researchers are often interested in matching NCSES data to other non-NCSES data sources. Individuals interested in matching data should review the [NCSES Policy on Matching Non-NCSES Data to Restricted Use Data Sets \(35 KB\)](#) to better understand how NCSES considers these requests.

The goal of having a restricted-use data License is to maximize the use of statistical information while protecting individually identifiable information from disclosure.

D. GENERAL INFORMATION

NCSES' core mission areas are:

- The collection, acquisition, analysis, reporting, and dissemination of statistical data on science, engineering, technology and research and development related to the United States and other nations;
- Support of research that uses NCSES data;
- Methodological research in areas related to its work; and
- Education and training of researchers in the use of large-scale nationally representative data sets

Alignment with NCSES Mission

Proposals that do not target one or more of NCSES' core mission areas will be returned without review. The NCSES program overlaps with many other research activities and areas at NSF. Researchers with projects that do not meet specific NCSES criteria might consider other NSF programs and activities. Those programs that may be of particular interest to NCSES researchers are: Science of Science: Discovery, Communication, and Impact (SoS: DCI), Methodology, Measurement and Statistics (MMS), Science of Organizations (SoO), Science and Technology Studies (STS), SBE Science of Broadening Participation (SBE SBP), and Partnerships for Innovation (PFI).

Interaction with NCSES

As noted in the section on Award Conditions, recipients will make a virtual presentation to the National Center for Science and Engineering Statistics to report on their activities at the conclusion of their work.

Dissertation Awards

NCSES Doctoral Dissertation Research Improvement Grants (DDRIGs) help to defray direct costs associated with conducting research, including data set acquisition, original data collection, additional statistical or methodological training, meeting with scholars associated with original datasets, and fieldwork away from the student's home campus.

Dissertation Advice to Students

As a general rule, proposals that review well are those that clearly state a central research question, make an argument that engages and/or debates relevant literature, specifies the data the student will gather and the analytic procedures the student will apply to those data. Additionally, strong proposals state what the researcher expects to find or show through the research.

When preparing the proposal, write clearly and concisely. Reviewers will be selected from a variety of specialty areas so it is possible that one or more reviewers will not specialize in your particular area of research. Defining key terms and keeping your proposal free of jargon will ensure that all reviewers will be able to understand your proposal and evaluate it fairly.

III. Award Information

Based on the quality of proposals and the availability of funds, NSF expects to make 5 to 10 awards each year.

IV. Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- **Standard research proposals:**
 - 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.
- Tribal Nations: An American Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges as a federally recognized tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. §§ 5130-5131.

Doctoral Dissertation Research Improvement Grant proposals: Doctoral Degree granting IHEs accredited in, and having a campus located in, the US acting on behalf of their faculty members.

Who May Serve as PI:

Standard research proposals: No special restrictions or limits.

Doctoral Dissertation Research Improvement Grant proposals: The dissertation advisor must be listed as the Principal Investigator and the student must be listed as the co-Principal Investigator.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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.

Data Management and Sharing Plan

To ensure efficient accessibility of new data, metrics and indicators that are developed via this solicitation, all research proposals that develop new data must include a Data Management and Sharing Plan. Proposers must adhere to NSF's general data policy (see [Data Management and Sharing Plan for SBE Proposals](#)). Data developed from NCSSES restricted-use datasets may not be shared publicly and will reside with NCSSES at the end of the research period for additional dissemination by NCSSES. Proposers should also apply the following requirements as appropriate.

Requirements for the Data Management and Sharing Plan for data developed from NCSSES datasets:

- Statement regarding where any new or linked data will be archived. At a minimum, the proposal should include a letter of support from the specified data center.
- Identification of the data management point of contact and the person who is responsible for submitting the data, metadata and other documentation.
- Clear indication of which data are to be shared in the research community. Such data must be made available through an openly accessible data management system as soon as data are collected and verified.

In some cases, the data that are developed or linked to NCSSES data will be sensitive in nature. Proposers may request an exemption from the NCSSES NSF program officer for those data. The request for exemption must clearly state why the data cannot be disseminated. In some cases, proposers might indicate a reasonable time period within which the data must be privately held.

Doctoral Dissertation Research Improvement Grant Proposals

Doctoral Dissertation Research Improvement Grant proposals submitted to NCSSES should be prepared in accordance with the guidelines for regular research proposals specified in the PAPPG. NCSSES DDRIG proposals have additional requirements that are specified below. Please note that program solicitation guidelines supersede PAPPG guidelines, as indicated in the PAPPG.

- Project Duration: 12 months with possibility of renewal (with additional funding) based on progress toward completion.
- Project Budget: Dissertation grants are generally for \$15,000 or less although higher levels of funding are possible with justification. Funds are for expenses associated with conducting the dissertation research (e.g., data collection, field work, payment to subjects, survey expenses, software, microfilm, data transcription, file creation and data merging, travel, and expenses incurred at sites away from the student's home institution). The grant does not support stipend, salary, or tuition reimbursement. Neither the PI (the dissertation advisor) nor any of the co-PIs (including the dissertation student) should be listed in Section A (Senior/Key Personnel) on the Budget, since DDRIG proposals do not provide funds for salaries or stipends for the doctoral student, the dissertation advisor, or other faculty advisors. Therefore, their names should be manually removed from Section A on the budget to avoid construal as voluntary committed cost sharing, which is not permitted.
- Proposal Title: This should begin with, "Doctoral Dissertation Research: ..."
- PI: The dissertation advisor must be listed as the Principal Investigator. The dissertation student must be listed as the co-Principal Investigator.

- **Project Summary:** Each proposal must contain a summary of the proposed project not more than one page in length. The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity. The intellectual merit portion should include, minimally, background information on the research (theory, prior research), research hypotheses and/or questions, and a description of methods and expected findings. The broader impacts portion might address such questions as: How well does the activity advance discovery and understanding? How does the work promote teaching, training, or learning? What may be the benefits of the proposed activity to society?
- **Project Description:** Must not exceed 10 single pages. Do not send transcripts and letters of recommendation but include any questionnaires or survey guides for original data collection as supplementary documents.
- **Results from Prior NSF Support section:** Not required for DDRIG proposals.

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. submitting organization's local time):

January 21, 2025

Third Tuesday in January, Annually Thereafter

June 17, 2025

Third Tuesday in June, Annually Thereafter

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 1-800-673-6188 or e-mail rgov@nsf.gov.

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

For Proposals Submitted Via Grants.gov:

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

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

application to Grants.gov. The completed application will be transferred to Research.gov for further processing.

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

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

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

VI. NSF Proposal Processing And Review Procedures

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

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

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

Proposals will be evaluated based on their relevance to NCSSES program goals and their prospect of improving the development, quality, or understanding of the S&T enterprise.

B. Review and Selection Process

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

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

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new recipients may require additional review and

processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

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

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

VII. Award Administration Information

A. Notification of the Award

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

B. Award Conditions

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

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

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

Administrative and National Policy Requirements

Build America, Buy America

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

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

Special Award Conditions:

Metadata Inventory Description

Within the first three months of the award, the Principal Investigator will provide a metadata inventory description (a high-level summary of the data to be developed) to the relevant archive. If a community-wide data coordination service is established, the metadata must be shared with this service. Every project must submit complete documentation and quality-controlled data to the appropriate archive in accordance with NSF's data policy. (See requirements for a Data Management and Sharing Plan in the Proposal Preparation and Submission Instructions.)

Interaction with NCSES

Recipients will make a virtual presentation to the National Center for Science and Engineering Statistics to report on their activities at the conclusion of their work.

C. Reporting Requirements

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

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

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

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

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:

- Sharon A. Boivin, telephone: (703) 292-4263, email: sboivin@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 (FASSED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.F.7 for instructions regarding preparation of these types of proposals.

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

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

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

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

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

Privacy Act And Public Burden Statements

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



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