NSF 24-562: Centers of Research Excellence in Science and Technology - Research Infrastructure for Science and Engineering

Referred to in this solicitation as CREST-RISE

Program Solicitation

Document Information

Document History

- **Posted:** March 25, 2024
- **Replaces:** NSF 23-565

View the program page

National Science Foundation
Directorate for STEM Education
Division of Equity for Excellence in STEM

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

August 02, 2024

First Friday in August, Annually Thereafter

Table Of Contents

Important Information And Revision Notes

This solicitation replaces NSF 23-565 CREST HBCU-RISE. This is a new solicitation and proposers should read it in its entirety. All Minority Serving Institutions (MSIs) that offer master's or research doctoral degrees in NSF-supported STEM fields that, at the time of proposal submission, have enrollments of 50% or more U.S. resident students (non-international) who are members of minority groups underrepresented in STEM and are Emerging Research Institutions may submit proposals. See Section IV. Eligibility Information for complete details. Recipients are required to use the NSF Education and Training Application (ETAP) to manage participants supported by CREST-RISE.

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:

Centers of Research Excellence in Science and Technology - Research Infrastructure for Science and Engineering (CREST-RISE)
Referred to in this solicitation as CREST-RISE

Synopsis of Program:

The Centers of Research Excellence in Science and Technology (CREST) program provides support to enhance the research capabilities of minority-serving institutions (MSIs) as defined in this solicitation's Eligibility section, through effective integration of education and research. The CREST program, composed of the CREST Centers, the CREST Postdoctoral Research Program, and the projects supported by this CREST-RISE solicitation, promotes the development of new knowledge, enhancements of the research productivity of individual faculty and postdoctoral scholars, and an expanded presence of research doctoral students in science, technology, engineering, and mathematics (STEM) disciplines, especially those from underrepresented groups.

CREST-RISE is the component of the CREST program that supports the expansion of institutional research capacity by increasing the strength of institutional graduate programs and the successful production of research doctoral students, especially those from groups underrepresented in STEM.

The CREST-RISE component supports STEM research doctoral programs in all NSF supported areas and encourages proposals in areas of national interest, such as artificial intelligence, data science and analytics; advanced materials, manufacturing, robotics; cybersecurity; plant genetics/agricultural technologies; quantum information sciences; nanotechnology, semiconductors/microelectronics technologies; climate change and clean energy.

CREST-RISE projects must have a direct connection to the long-term plans of the host department(s) and the institution's strategic plan and mission. Project plans should emphasize activities designed to increase the production of research doctoral students, especially those underrepresented in STEM as well as expand institutional research capacity.

The goals of CREST-RISE are to increase: 1) the number of STEM research doctoral programs at MSIs (as defined in the Eligibility section), 2) the number of STEM research doctoral students graduating from MSIs, especially those from groups underrepresented in STEM, and 3) institutional research capacity to increase doctoral students' graduation rates. To achieve these goals, the CREST-RISE program includes three tracks as follows:

- CREST-RISE STEM Doctoral Programs Support Initiative (CREST-RISE DPSI)
- CREST-RISE Research Advancement and Development (CREST-RISE RAD)
- CREST-RISE Equipment & Instrumentation (CREST-RISE E&I)

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.

- Sonal Dekhane, Program Director, telephone: (703)405-8977, email: sdekhane@nsf.gov
- Luis A. Cubano, Lead Program Director, telephone: (703) 292-7941, email: lcubano@nsf.gov
- Nicole E. Gass, Program Specialist, telephone: (703) 292-8378, email: ngass@nsf.gov

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

- 47.076 --- STEM Education

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 2 to 9

Anticipated Type of Award:

CREST-RISE DPSI: Continuing Grant

CREST-RISE RAD: Continuing Grant

CREST-RISE E&I: Standard Grant

Estimated Number of Awards:

Up to 3 awards CREST-RISE DPSI

Up to 2 awards CREST-RISE RAD

Up to 4 awards CREST-RISE E&I

The number of awards made annually is contingent on the availability of funds and the submission of meritorious proposals.

Anticipated Funding Amount:

$6,000,000

CREST-RISE DPSI:

DPSI awards will not exceed $2,000,000 during a five-year period. DPSI awards will be managed as Continuing Grants.

CREST-RISE RAD:

RAD awards will not exceed $1,000,000 during a five-year period. RAD awards will be managed as Continuing Grants.

CREST-RISE E&I:

E&I awards will not exceed $500,000 during the one-year award period. E&I awards will be managed as Standard Grants.

Anticipated Funding Amount: $6,000,000

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Minority Serving Institutions (see definition below) that are Emerging Research Institutions (ERIs) and offer master's or research doctoral degrees in NSF-supported STEM fields are eligible to submit. Emerging Research Institutions are those that have less than $50,000,000 in research expenditures per year as reported at https://ncsesdata.nsf.gov/profiles/site?method=rankingBySource&ds=herd in three of the last five years.

  For this solicitation, MSIs are defined as institutions, at the time of proposal submission, that have enrollments of 50% or more U.S. resident students (non-international) (based on total student enrollment) who are members of minority groups underrepresented among those holding advanced degrees in science and engineering fields. Proposals are also invited from institutions of higher education that meet the 50% enrollment criterion and primarily serve populations of students with disabilities. Eligibility may be determined by reference to the Integrated Postsecondary Education Data System (IPEDS) of the US Department of Education National Center for Education Statistics (http://nces.ed.gov/ipeds/).

Who May Serve as PI:

CREST-RISE DPSI

The Principal Investigator (PI) must hold a full-time faculty appointment in an NSF-supported STEM discipline at the institution submitting the proposal.

CREST-RISE RAD

The PI must meet all the following eligibility requirements at the time of submission:

- Be a full-time faculty member with the DPSI institution,
- Have earned a doctoral degree no more than 10 years prior to the proposal submission date,

- Be engaged in research in a STEM area supported by NSF and in alignment with the institution's active DPSI project,
- Mentor or commit to mentor research doctoral students in the DPSI subject area,
- Hold a position as an assistant professor (or equivalent),
- Be untenured and on a tenure-track or tenure-track equivalent position, and
- Have not previously received a RAD award.

Tenure-Track Equivalency – For a position to be considered a tenure-track-equivalent position, it must meet the following requirement:

- the employee has a continuing appointment that is expected to last the five years of a RAD award

For tenure-track equivalent faculty, a Departmental Letter must affirm that the investigator's appointment is at an early-career level equivalent to pre-tenure status. Further, the Departmental Letter must clearly and convincingly demonstrate how the faculty member's appointment satisfies all the above requirements of tenure-track equivalency.

Faculty members who are associate professors, full professors, or have equivalent appointments with or without tenure/tenure-equivalency, are not eligible to serve as PI for a RAD award.

Faculty members who hold Adjunct Faculty or equivalent appointments are not eligible to serve as PI for the RAD award.

Co-PIs are not permitted for a RAD proposal.

CREST-RISE E&I

The PI must be a full-time faculty member at the requesting institution and must be mentoring DPSI supported research doctoral students from the institution's active DPSI award.

Limit on Number of Proposals per Organization:

CREST-RISE DPSI: 1

CREST-RISE RAD: 2

CREST-RISE E&I: 1

CREST-RISE DPSI

Institutions can propose to create a research doctoral program or strengthen an existing research doctoral program. Proposals to create a research doctoral program will be funded only once per institution per disciplinary area.

An institution may have only one active DPSI/HBCU-RISE award, irrespective of focus area. Therefore, institutions with an active DPSI/HBCU-RISE award are not eligible to submit a proposal in response to this solicitation unless the active award ends prior to the proposed start date specified in the proposal. The institution is responsible for verifying whether they hold a current active DPSI/HBCU-RISE award.

Institutions that have completed a CREST-RISE or HBCU-RISE award in a disciplinary area may re-compete in other STEM disciplinary areas supported by NSF that are significantly different from those of the previous research doctoral program award(s) held in the last five years. To be significantly different, the new project must be associated with a different four-digit Classification of Instructional Programs (CIP) code, and name new PIs, new co-PIs, and new faculty investigators who have not received a CREST-RISE or HBCU-RISE award in the last five years.

Only one DPSI proposal may be submitted per eligible institution.

After 10 years of CREST-RISE or HBCU-RISE support, an institution must wait five years before submitting another proposal to the DPSI program.

CREST-RISE RAD

An institution must have an active DPSI award to be eligible for RAD. An institution may receive a maximum of four RAD awards and one active RAD award per individual PI during the five-year DPSI project.

RAD proposals must be submitted after the first year and before the end of the third year from the DPSI award start date.

Up to two RAD proposals may be submitted per eligible institution per deadline date.

CREST-RISE E&I

An institution must have an active DPSI award to be eligible for E&I. An institution may receive a maximum of two E&I awards during the five-year DPSI project.

E&I proposals must be submitted after the first year and before the end of the third year from the DPSI award start date.

Only one E&I proposal may be submitted per eligible institution per deadline date.

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

CREST-RISE DPSI: 1

CREST-RISE RAD: 1

CREST-RISE E&I: 1

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:**

  Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

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

  August 02, 2024

  First Friday in August, 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:

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

I. Introduction

The CREST program's overall goal is to build the STEM research and education capacity of minority serving institutions (MSIs) with strong records of producing STEM graduates, especially those who are members of groups underrepresented in STEM fields.

CREST-RISE is one strand of the larger CREST program whose specific goals are to increase: 1) the number of STEM research doctoral programs at MSIs (as defined in the Eligibility section), 2) the number of STEM research doctoral students graduating from MSIs, especially those from groups underrepresented in STEM, and 3) institutional research capacity to increase doctoral students' graduation rates. It is expected that awards made under this solicitation will catalyze institutional transformation through the strengthening of research capabilities commensurate with an institution's mission and long-term goals, and support the development of STEM scholars, especially those from groups underrepresented in STEM.

As with all CREST projects, CREST-RISE projects should be designed to promote synergy between education and research. CREST-RISE supported research doctoral students should be engaged in the process of discovery and innovation and guided by the faculty. Evidence-based recruitment and retention strategies should be employed to increase the number of STEM research doctoral students and graduates, especially those who are members of groups underrepresented in STEM. Partnerships with other MSIs, especially those that are primarily undergraduate institutions, are encouraged. Awarded institutions are required to evaluate the impact of the award in influencing institutional transformation as part of their project evaluation.

Projects should employ cutting-edge and relevant curricula to support students' academic success and should provide relevant professional and research-related experiences that support their transition into STEM careers. Students should be exposed to opportunities that foster their significant participation in the broader community of scholarship in their respective fields.

An important project design consideration is the inclusion of activities that leverage award funds to secure additional support from federal, state, and local agencies, and to develop industry and academic partnerships to sustain the work initiated by the CREST-RISE award.

II. Program Description

The CREST-RISE program includes three tracks as follows:

- CREST-RISE STEM Doctoral Programs Support Initiative (CREST-RISE DPSI)
- CREST-RISE Research Advancement and Development (CREST-RISE RAD)
- CREST-RISE Equipment & Instrumentation (CREST-RISE E&I)

A. CREST-RISE DPSI:

DPSI awards support the production of STEM research doctoral graduates to include those from groups underrepresented in STEM and the development of research capacity in STEM disciplines at MSIs. Proposals should include a component that outlines strategies for connecting with other NSF-funded awards held by the institution and related to the proposed project's goals and scope. Proposals should also include authentic partnerships with other MSIs, especially those that are primarily undergraduate institutions, that contribute to project goals, benefit all partners, and increase the transition of undergraduate students from underrepresented groups to doctoral programs in STEM.

DPSI Award Characteristics:

Proposed projects must be designed to 1 increase the production of research doctoral students, including those who are members of groups underrepresented in STEM, and 2) expand institutional research capacity. Research doctoral students must be U.S. citizens, nationals, or permanent residents, as stated in the Eligibility section of this solicitation. Proposed projects should also have a direct and synergistic connection to the long-term plans of the host department and the institution’s mission.

DPSI proposals must address an NSF-supported discipline(s). NSF especially welcomes proposals in areas of strong national interest, such as artificial intelligence, data science and analytics; advanced materials, manufacturing, robotics; cybersecurity; plant genetics/agricultural technologies; quantum information sciences; nanotechnology, semiconductors/microelectronics technologies; climate change and clean energy. In addition, for this solicitation, the areas outlined in the resources below are of great interest:

- CHIPS and Science Act of 2022 www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact- sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/)
- Industries of the Future (https://www.whitehouse.gov/ostp/news-updates/2022/04/30/the-final-industries-of-the-future-report-to-congress/ OSTP_IOTF_Report.pdf)
- Understanding the Brain (https://www.nsf.gov/news/special_reports/brain/)
- DOE Earthshots (www.energy.gov/policy/energy-earthshots-initiative)

DPSI proposals must offer significant enhancements to an institution's capacity to carry out doctoral level research, more than is afforded by traditional single- or multi-investigator research proposals. DPSI support should not replace other active or available federal, state, or institutional resources, but rather should add significant value to the existing institutional strategic plan. Reviewers will be asked to consider the unique goals of the DPSI application in developing research doctoral program capacity, in addition to supporting research activities.

A key feature of proposed projects should be comprehensive strategies to diversify talent regarding recruitment, mentoring, retention, and graduation of research doctoral students (U.S. citizens, nationals, and permanent residents) in NSF-supported STEM fields, which includes members of groups underrepresented in STEM. NSF's 2022-2026 Strategic Plan calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions

to include those who are underserved and/or underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering.

Career development opportunities, provision for developing professional skills, instruction in ethics and the responsible conduct of research, and training in the communication of the substance and importance of research to non-scientist audiences are strongly encouraged as proposed activities.

Each DPSI proposal should describe an evaluation plan to formatively monitor progress towards its goals and objectives and to provide information for optimizing project design. A final project-level evaluation is required to synthesize lessons learned. In addition, each awarded project will be required to participate in a CREST program-level evaluation to assess the CREST program's contributions to advancing the science and engineering research and education capabilities of MSIs.

DPSI awards are not required to convene meetings of an external advisory group or committee. However, each proposal shall identify an internal steering committee to include the PI, co-PIs, and other applicable stakeholders to review the results of the evaluation process, to ensure that progress is consistent with departmental and institutional goals, and to discuss potential project modifications to realize those goals more effectively.

Supportable DPSI award activities may include but are not limited to hiring faculty in the identified NSF-supported research areas, student attendance at professional meetings and seminars, education activities directed toward the development of a diverse, internationally competitive, and globally engaged workforce of scientists and engineers well-prepared for a broad set of career paths, student recruitment and retention activities, professional skills training, and graduate research activities. Postdoctoral support is not allowed.

NSF is committed to a culture and climate of research that results in an inclusive and diverse workforce. For this reason, NSF strongly encourages the inclusion of individuals from groups underrepresented in STEM, women, veterans, and/or persons with disabilities in its programs and project leadership teams. In identifying the members of the DPSI research team, the proposing institution should strongly encourage participation of the full spectrum of diverse talent that society has to offer, including those who are underrepresented or underserved.

DPSI Commitment and Sustainability

Organizational commitment from administrators and leaders to the proposed project activities is vital for successful projects and for the financial and organizational sustainability of promising activities. Letters of support from the provost or equivalent university officials with supervisory authority related to faculty, research, facilities, equipment, and education are required and should be submitted as supplementary documents.

Proposals should discuss the commitment of institutional leadership to revisions to current practices and policies that will enhance the institution’s research capabilities and increase its production of doctoral graduates and diverse talent. Proposals should discuss how the successful components developed under the project will be sustained. Awards are expected to lead to long-term organizational change in how the institution supports faculty to increase their research productivity as well as how it recruits, supports, retains, and graduates doctoral students in STEM. Therefore, proposed projects are expected to consider the financial and organizational sustainability and institutionalization of the project activities from the project’s inception.

B. CREST-RISE RAD

The CREST-RISE RAD awards provide funds for junior faculty to develop their research agenda, to collect preliminary data for inclusion in new proposals for extramural funding, and to support the training of research doctoral students. Junior faculty at institutions that have active DPSI awards are eligible to serve as PI on a RAD proposal. PIs must be mentoring or seeking to mentor research doctoral students. PIs should refer to the eligibility section for detailed eligibility criteria. Co-PIs are not permitted for a RAD proposal. RAD funds can be requested after the first year and before the end of the third year from the start date of the DPSI award. Award duration can be up to 5 years and a maximum of $1,000,000 can be requested through RAD. RAD awards cannot be transferred to non-eligible institutions.

RAD proposals must show clear alignment with the goals of the active DPSI award and must clearly describe how it contributes to the DPSI at the institution. Mentoring (or commitment to mentoring) of research doctoral students,

including those from underrepresented groups in STEM is required. Proposed research projects should build a foundation for the PI's long-term research scholarship and help advance the PI's professional goals. Proposals should include a clear research plan, a solid plan for integrating research and educational activities, and a research doctoral student mentoring plan.

C. CREST-RISE E&I

The CREST-RISE E&I awards provide funds for the acquisition of equipment and instrumentation to support the training and production of research doctoral graduates including students from groups that are underrepresented in STEM. Institutions with active DPSI awards are eligible to request E&I funds for needs that align with and contribute to the DPSI project goals. Proposals must show clear alignment with goals of the institution's active DPSI award and must include activities that support research doctoral student training. Proposals must clearly describe how equipment expenditures contribute to the DPSI project goals at the institution.

The PI must be affiliated with an active DPSI project and must be actively mentoring research doctoral students. Funds can be requested after the first year and before the end of the third year from the start date of the active DPSI award.

Award duration is 12 months. Up to $100,000 can be requested for equipment to be used by individual faculty members at the DPSI institution and their research students.

Up to $500,000 can be requested for equipment that can be shared among multiple faculty members at the DPSI institution and their research doctoral students. Equipment can also be used by faculty and students from other institutions for activities that contribute to the DPSI project goals. Individual equipment may be transferred to another institution. Shared equipment cannot be transferred to other institutions. E&I proposals should be submitted as an Equipment Proposal as described in the PAPPG.

III. Award Information

Anticipated Type of Award:

Continuing or Standard Grant

Estimated Number of Awards:

Up to 3 awards CREST-RISE DPSI

Up to 2 awards CREST-RISE RAD

Up to 4 awards CREST-RISE E&I

The number of awards made annually is contingent on the availability of funds and the submission of meritorious proposals.

Anticipated Funding Amount:

$6,000,000

CREST-RISE STEM Doctoral Programs Support Initiative (CREST-RISE DPSI):

DPSI awards will not exceed $2,000,000 during a five-year period. DPSI awards will be managed as Continuing Grants.

CREST-RISE Research Advancement and Development (CREST-RISE RAD):

RAD awards will not exceed $1,000,000 during a five-year period. RAD awards will be managed as Continuing Grants.

CREST-RISE Equipment & Instrumentation (CREST-RISE E&I):

E&I awards will not exceed $500,000 during the one-year award period. E&I awards will be managed as Standard Grants.

IV. Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Minority Serving Institutions (see definition below) that are Emerging Research Institutions (ERIs) and offer master's or research doctoral degrees in NSF-supported STEM fields are eligible to submit. Emerging Research Institutions are those that have less than $50,000,000 in research expenditures per year as reported at https://ncsesdata.nsf.gov/profiles/site?method=rankingBySource&ds=herd in three of the last five years.

  For this solicitation, MSIs are defined as institutions, at the time of proposal submission, that have enrollments of 50% or more U.S. resident students (non-international) (based on total student enrollment) who are members of minority groups underrepresented among those holding advanced degrees in science and engineering fields. Proposals are also invited from institutions of higher education that meet the 50% enrollment criterion and primarily serve populations of students with disabilities. Eligibility may be determined by reference to the Integrated Postsecondary Education Data System (IPEDS) of the US Department of Education National Center for Education Statistics (http://nces.ed.gov/ipeds/).

Who May Serve as PI:

CREST-RISE DPSI

The Principal Investigator (PI) must hold a full-time faculty appointment in an NSF-supported STEM discipline at the institution submitting the proposal.

CREST-RISE RAD

The PI must meet all the following eligibility requirements at the time of submission:

- Be a full-time faculty member with the DPSI institution,
- Have earned a doctoral degree no more than 10 years prior to the proposal submission date,
- Be engaged in research in a STEM area supported by NSF and in alignment with the institution's active DPSI project,
- Mentor or commit to mentor research doctoral students in the DPSI subject area,
- Hold a position as an assistant professor (or equivalent),
- Be untenured and on a tenure-track or tenure-track equivalent position, and
- Have not previously received a RAD award.

Tenure-Track Equivalency – For a position to be considered a tenure-track-equivalent position, it must meet the following requirement:

- the employee has a continuing appointment that is expected to last the five years of a RAD award

For tenure-track equivalent faculty, a Departmental Letter must affirm that the investigator's appointment is at an early-career level equivalent to pre-tenure status. Further, the Departmental Letter must clearly and convincingly demonstrate how the faculty member's appointment satisfies all the above requirements of tenure-track equivalency.

Faculty members who are associate professors, full professors, or have equivalent appointments with or without tenure/tenure-equivalency, are not eligible to serve as PI for a RAD award.

Faculty members who hold Adjunct Faculty or equivalent appointments are not eligible to serve as PI for the RAD award.

Co-PIs are not permitted for a RAD proposal.

CREST-RISE E&I

The PI must be a full-time faculty member at the requesting institution and must be mentoring DPSI supported research doctoral students from the institution's active DPSI award.

Limit on Number of Proposals per Organization:

CREST-RISE DPSI: 1

CREST-RISE RAD: 2

CREST-RISE E&I: 1

CREST-RISE DPSI

Institutions can propose to create a research doctoral program or strengthen an existing research doctoral program. Proposals to create a research doctoral program will be funded only once per institution per disciplinary area.

An institution may have only one active DPSI/HBCU-RISE award, irrespective of focus area. Therefore, institutions with an active DPSI/HBCU-RISE award are not eligible to submit a proposal in response to this solicitation unless the active award ends prior to the proposed start date specified in the proposal. The institution is responsible for verifying whether they hold a current active DPSI/HBCU-RISE award.

Institutions that have completed a CREST-RISE or HBCU-RISE award in a disciplinary area may re-compete in other STEM disciplinary areas supported by NSF that are significantly different from those of the previous research doctoral program award(s) held in the last five years. To be significantly different, the new project must be associated with a different four-digit Classification of Instructional Programs (CIP) code, and name new PIs, new co-PIs, and new faculty investigators who have not received a CREST-RISE or HBCU-RISE award in the last five years.

Only one DPSI proposal may be submitted per eligible institution.

After 10 years of CREST-RISE or HBCU-RISE support, an institution must wait five years before submitting another proposal to the DPSI program.

CREST-RISE RAD

An institution must have an active DPSI award to be eligible for RAD. An institution may receive a maximum of four RAD awards and one active RAD award per individual PI during the five-year DPSI project.

RAD proposals must be submitted after the first year and before the end of the third year from the DPSI award start date.

Up to two RAD proposals may be submitted per eligible institution per deadline date.

CREST-RISE E&I

An institution must have an active DPSI award to be eligible for E&I. An institution may receive a maximum of two E&I awards during the five-year DPSI project.

E&I proposals must be submitted after the first year and before the end of the third year from the DPSI award start date.

Only one E&I proposal may be submitted per eligible institution per deadline date.

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

CREST-RISE DPSI: 1

CREST-RISE RAD: 1

CREST-RISE E&I: 1

Additional Eligibility Info:

Institutions that do not meet the criteria identified in this solicitation to act as a lead institution can be named as subawardees in a proposal.

Submission of a collaborative proposal from multiple institutions is not allowed. Funding of partnering institutions, if any, must be requested via subawards in the full proposal; separately submitted collaborative proposals will not be accepted.

Institutions can propose to create a research doctoral program or strengthen an existing research doctoral program in an NSF supported STEM area. Proposals to create a research doctoral program will be funded only once per institution per disciplinary area.

Institutions that have completed a CREST-RISE or HBCU-RISE award in a disciplinary area may re-compete in other disciplinary areas that are significantly different from those of the previous research doctoral program award(s) received in the last five years. To be significantly different, the new project must be associated with a different 4-digit Classification of Instructional Programs (CIP) code, have new PIs, new co-PIs, and new faculty investigators who have not received a CREST-RISE or HBCU-RISE award in the last five years.

V. Proposal Preparation And Submission Instructions

A. Proposal Preparation Instructions

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

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

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

Submission of a collaborative proposal from multiple institutions is not allowed. Funding of partnering institutions, if any, must be requested via subawards in the full proposal; separately submitted collaborative proposals will not be accepted. Eligible parties intending to submit a proposal are encouraged to participate in webinars that will be webcast after the release of this solicitation. See CREST webpage for dates.

DPSI Proposal Contents

Proposals must include all of the following items. In cases where requirements given in this document differ from those given in the PAPPG or Grants.gov Application Guide, this solicitation takes precedence. Proposals will be returned without review if they do not meet the requirements stipulated in the solicitation.

1. Cover Sheet

- Start date: For planning purposes, February 1 of the award year should be indicated as the award start date.
- PI: The proposal must show the proposed Project Director as the Principal Investigator.
- Title of the Proposed Project must begin with: "CREST-DPSI (C):" or “CREST-DPSI (S):". C for creation of a new STEM research doctoral program and S for strengthening of an existing STEM research doctoral program.
- The title must be informative and descriptive of the project, concise (20 words or less), and use Title Case. The title must not include the institution name, any acronyms ("STEM" excepted), or quotation marks.

2. Project Summary (1 page)

Provide an overview of the CREST DPSI project.

- The summary should be informative to people working in the same or related fields, and understandable to a broad audience within the scientific domain.
- The summary should provide a clear and concise description of the project including mission and vision, and significance of the proposed work.
- The summary should clearly describe the scientific area focus of the STEM Doctoral Program(s) and goals for education and broadening participation.
- Both NSF merit review criteria (intellectual merit and broader impacts) must be addressed in separate statements in the project summary (see the PAPPG for additional instructions).
- The summary must include as a separate sentence at the bottom of the page the 4-digit Classification of Instructional Programs (CIP) code that most closely matches with the project. CIP codes are available at https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55. Example: 26.02

3. Project Description (15 pages)

The Project Description must contain only Sections 3.a through 3.h described below and cannot exceed 15 pages including tables and illustrations.

- Importantly, the project description should contain specific, measurable, and obtainable objectives that will be used to measure the progress of the award, if funded.
- The broader impacts resulting from the proposed project must be addressed and described in a separate section of the narrative.

3.a Problem Description and Rationale for Selected Approach

Describe the challenges that the project will address. Include timeliness of addressing the challenges.

- This section indicates how the project is aligned with the mission of the institution and long-term goals of the department(s) in increasing the number of doctoral students in STEM and building the research capacity.

- The goals and objectives of the project must be clearly stated, measurable, aligned with the strategic plans of the institution and achievable within the proposed time frame. This section includes baseline data.
- The proposal must address institutional support for, and financial and organizational sustainability of the project. The proposal should include a component that outlines a strategy for the creative integration of NSF-funded awards at the institution as well as the integration of the research and educational activities.

3.b Description of the STEM Doctoral Programs Capacity Building Objectives

State the overall vision and long-range STEM Doctoral Programs capacity building goals. Describe how STEM Doctoral Programs capacity building will lead to increased doctoral graduates and research productivity. Provide a timeline for the activities.

- This section should provide a STEM Doctoral Programs capacity building plan with sufficient detail to allow assessment of the project's merit.
- Indicate in the plan the specific role of each participant.
- Indicate in the plan the potential impact or expected significance the plan will have in the production of doctoral graduates from the full spectrum of talent that society has to offer, including those who are underrepresented in STEM.

3.c Description of the Education and Human Resource Development Objectives

Describe how the DPSI proposal will provide professional development and other appropriate opportunities to faculty members and doctoral students to assist them in setting up a research agenda and progressing in their careers.

- This section describes how research and education will be integrated. Education programs and activities should be evidence-based practices developed in the context of current education research and be monitored through a formal project-specific evaluation effort led by independent evaluators as described in 3.g.
- This section describes plans for retention and graduation of doctoral students, and the mentoring and professional development of doctoral students and faculty members. Use of evidence-based strategies to mentor, retain and graduate members from groups underrepresented in STEM is expected.
- Partnership plans if any, with other minority-serving institutions, especially those that are primarily undergraduate institutions, should be described here.
- Describe all proposed activities in sufficient detail to allow assessment of their intrinsic merit and potential effectiveness.

3.d Recruitment Plan

Describe how the DPSI proposal will contribute to the production of all doctoral students including those who are underrepresented or underserved in STEM through its recruitment activities.

- This section describes a comprehensive plan for the recruitment of doctoral students into the doctoral program and research activities that attracts students from all backgrounds including those from groups underrepresented in STEM.
- Partnership plans with other minority-serving institutions, especially those that are primarily undergraduate institutions if any, should be described here.
- An evaluation of recruitment activities should be included in the project's evaluation plan.

3.e Broader Impacts

Describe the broader impacts objectives and outline strategies for achieving them.

- Describe plans for increasing diversity through the inclusion of individuals who are underrepresented in STEM or underserved.

- Describe the contribution/role of students and faculty and how they will be integrated into activities.
- Explain how mentoring will be used to provide a supportive environment for all project participants.
- Explain how progress will be measured and how strategies will be adapted, as appropriate.
- Describe the proposed activities in sufficient detail to allow assessment of their intrinsic merit and potential effectiveness.

3.f Description of the Management Plan

Describe the management of the DPSI project to ensure optimal performance.

- Present a management plan including a diagram to explain the organizational relationships and reporting structure among the key areas of responsibility.
- The management plan identifies key members of the Management Team and explains their specific roles and areas of responsibility.
- The management plan explains the role of each key participant/component.
- The management plan describes the processes to be used to prioritize activities; to allocate funds across activities; and to select a replacement PI, if needed.
- The management plan must identify members of the Internal Steering Committee and the evaluator.
- The management plan should address alignment with DPSI's commitment to include URMs, women, veterans, or persons with disabilities in the leadership of DPSI proposals.

3.g Evaluation Plan

All proposals must include an evaluation section that describes how the project evaluator/evaluation team will gauge the accomplishment of project goals and the impacts of the project. The budget must include adequate resources for project evaluation. This section must:

- Include a logic model with short-term, and intermediate term expected outcomes. Include a description of the evaluation design and methods that will be used.
- The evaluation plan should include formative aspects that will provide information to inform evidence-based decisions about changes in its activities, and summative aspects that will provide evidence of overall impacts of the project. Include an evaluation design based on benchmarks, indicators, or expected outcomes related to project goals, objectives, and activities.
- Identify the person(s) who will lead the evaluation and briefly describe their academic training and professional experience that qualifies them to serve as an evaluator. Evaluator(s) may be internal or external to DPSI institutions but must be external to the project itself and positioned to carry out the evaluation plan independently.

3.h Results from Prior NSF Support

Results from Prior NSF Support (up to 5 pages) in accordance with the guidance in the PAPPG.

This section must also include results from any current or prior DPSI/HBCU-RISE support received by the institution including the number of research doctoral students supported, number of research doctoral students currently enrolled, and number of research doctoral students that completed graduation requirements.

4. Facilities, Equipment and Other Resources (1 page limit)

Provide a synopsis of institutional resources that will be available (dedicated space, access to facilities and instrumentation, faculty and staff positions, including plans to make cluster hires if appropriate, access to programs that assist with curriculum development or broadening participation, or other institutional programs that could provide

support). Note that inclusion of voluntary committed cost sharing is prohibited. The description must be narrative in nature and must not include any quantifiable financial information.

5. Budget and Budget Justification

Provide a budget for each year. A cumulative budget will be generated automatically. The proposed budget should be consistent with the needs and complexity of the proposed activity. Funds must also be included for attendance to the CREST Program annual PI meeting. See Section V.B. Budgetary Information for budgetary restrictions.

Submit a budget justification.

6. References Cited (5-page limit, separate from the 15-page limit for the Project Description)

7. Special Information and Supplementary Documents

The proposal should include applicable supplementary documents as instructed in the PAPPG. The following items must be provided as additional supplementary documents.

7.a Ethics Plan (1-page limit)

Provide a clear statement of the proposed policies on ethics training, responsible conduct of research, and intellectual property rights. A program of training in ethics and responsible conduct of research for all faculty, postdoctoral researchers, and students is required. Training topics should include the nature of the research, methodologies used, ownership of research and ideas, and roles and responsibilities regarding intellectual property, and civil treatment of colleagues.

7.b Doctoral Student Mentoring Plan (1-page limit)

Each proposal that requests funding for doctoral students must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Proposers are advised that this plan is separate and distinct from the Postdoctoral Researcher Mentoring Plan that is conditionally required by the PAPPG. The doctoral students mentoring plan may not be used to circumvent the Project Description page limitation.

7.c Letter of Support (2-page limit) (Required) and Partnership Letters (Optional) (2-page limit each)

A letter of support from the provost or equivalent university official with authority related to faculty, research, facilities and/or equipment, and education must be submitted, which describes the support for and commitment to the project (including space). The institution must commit to implementing systemic changes to increase STEM doctoral programs and research productivity. The letter of support must express awareness of, support for, and specific commitments to the project.

The letter of support may include information related to financial and organizational sustainability and commitment of the provost or equivalent university official to the project. A letter of support that merely endorses the project or offers nonspecific support for the project activities must not be included and the proposal may be returned without review if general support letters are included. Note that organizational commitment can also be demonstrated through commitment to a project's financial and organizational sustainability. For guidance on voluntary uncommitted cost sharing please review the NSF Proposal and Award Policies and Procedures Guide (PAPPG).

Partnership letters (if any partnerships are proposed) must be provided for partnership arrangements of significance to the proposal. The letters must describe the support that will be provided and the commitment to the project and do not need to be limited to the recommended language in the NSF PAPPG.

Proposals submitted without a Letter of Support may be returned without review.

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

8.a Optional

List of suggested reviewers and contact information or reviewers not to include.

CREST-RISE RAD Proposal Contents

Proposals must include all the following items. In cases where requirements given in this document differ from those given in the PAPPG or Grants.gov Application Guide, this solicitation takes precedence. Proposals will be returned without review if they do not meet the requirements stipulated in the solicitation.

1. Cover Sheet

- Start date: For planning purposes, February 1 of the award year should be shown as the start date.
- PI: The proposal must show the proposed project Director as the Principal Investigator.
- No co-PIs are permitted.
- The title of the proposed project must begin with: "CREST-RISE RAD:".
- The title must be informative and descriptive of the project, concise (20 words or less), and uses Title Case. The title must not include the institution name, any acronyms ("STEM" excepted), or quotation marks.

2. Project Summary (1 page)

Provide an overview of the CREST-RISE RAD project.

- The summary should be informative to people working in the same or related fields, and understandable to a broad audience within the scientific domain.
- The summary should provide a clear and concise description of the project including mission and vision, and significance of the proposed work.
- The summary should clearly describe the scientific area focus of the PI's research and goals for broadening participation.
- Both NSF merit review criteria (intellectual merit and broader impacts) must be addressed in separate statements in the project summary (see the PAPPG for additional instructions).
- At the bottom of the page add the 4-digit Classification of Instructional Programs (CIP) code that is most closely associated with the project. CIP codes are available at https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55. Example: 26.02

3. Project Description (15 pages)

The Project Description section should contain a well-argued and specific proposal for activities that will, over a 5-year period, build a firm foundation for a lifetime of contributions to research. The proposed project should aim to advance the PI's research goals.

The Project Description should include:

- a description of the proposed research project, including preliminary supporting data where appropriate, specific objectives, methods, and procedures to be used, and expected significance of the results,
- a description of the alignment of the research with the DPSI project at the institution,
- a description of how DPSI doctoral students will be involved in the research,
- the broader impacts resulting from the proposed project must be addressed and described in a separate section of the narrative labeled "Broader Impacts", and
- results of prior NSF support, if applicable.

4. Letter of Support (2-page limit) (Required) (a proposal submitted without this Letter will be returned without review) and Letters of Collaboration (2-page limit each)

To demonstrate the institution’s support of the research development plan of the PI, the proposal must include one (and only one) letter of support. The letter must be from the PI's department head (or equivalent organizational official) and the DPSI PI. In the case of joint appointments, the letter must be signed by both department heads and the DPSI PI.

The Letter of Support must be no more than 2 pages in length and include the department head's and DPSI PI name and title below the signature. The letter must contain the following elements:

- A statement to the effect that the PI is eligible for the CREST-RISE RAD track. For tenure-track equivalent faculty, the Letter of Support must affirm that the investigator's appointment is at an early-career level equivalent to pre-tenure status, pursuant to the eligibility criteria specified above. Further, for tenure-track equivalent faculty, the Letter of Support must clearly and convincingly demonstrate how the faculty member satisfies all the requirements of tenure-track equivalency as defined in the eligibility criteria specified in this solicitation.
- An indication that the PI's proposed research is aligned with the institution’s DPSI project goals, and that the department is committed to the support and professional development of the PI; and
- A description of the ways in which the department head (or equivalent) and DPSI PI will ensure the appropriate mentoring of the PI.

Letters of Collaboration – If the project involves collaborative arrangements of significance, these arrangements must be documented through letters of collaboration.

The letters must describe the support that will be provided and the commitment to the project. The letters of collaboration do not need to be limited to the recommended language in the NSF PAPPG.

Please note that letters of recommendation for the PI or other letters of support for the project are not permitted.

CREST-RISE E&I Proposal Contents

The following instructions supplement the guidelines in the NSF Proposal & Award Policies & Procedures Guide (PAPPG) and NSF Grants.gov Application Guide for the specified sections. Proposals will be returned without review if they do not meet the requirements stipulated in the solicitation.

Follow NSF PAPPG Equipment Proposal instructions with the following exception:

1. Cover Sheet

- Start date: For planning purposes, February 1 of the award year should be shown as the start date.
- The title of the proposed project must begin with: "CREST-RISE E&I:"
- The title must be informative and descriptive of the project, concise (20 words or less), and uses Title Case. The title must not include the institution name, any acronyms ("STEM" excepted), or quotation marks.

2. Letter of Support (2-page limit) (Required) (a proposal submitted without this Letter will be returned without review) and Letters of Collaboration (2-page limit each)

To demonstrate the institution’s support for the equipment, the proposal must include one (and only one) letter of support. The letter must be from the PI's department head (or equivalent organizational official) and the DPSI PI. In the case of joint appointments, the letter must be signed by both department heads and the DPSI PI.

The Letter of Support must be no more than 2 pages in length and include the department head's and DPSI PI name and title below the signature. The letter must contain the following elements:

- An indication that the equipment is aligned with the institution’s DPSI project goals, and that the institution is committed to the support of the equipment; and
- A description of the ways in which the department head (or equivalent) and DPSI PI will ensure the appropriate use of the equipment and the access of DPSI students to the equipment.

Letters of Collaboration – If the project involves collaborative arrangements of significance, these arrangements must be documented through letters of collaboration.

The letters must describe the support that will be provided and the commitment to the project.

The letters of collaboration do not need to be limited to the recommended language in the NSF PAPPG.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

CREST-RISE DPSI

DPSI awards will not exceed $2,000,000 during a five-year period.

Submission of a collaborative proposal from multiple organizations is not allowed. Proposals involving partnering organizations must use subawards made by the lead organization to partnering organizations. The total amount of funding to subawardee institutions must reflect the institution's effort. The total amount of funding to all subawardee institutions may not exceed 10% of the cumulative budget going to the primary institution, for example $200,000 for a $2,000,000 budget.

Funds cannot be used to support postdoctoral scientists.

Research doctoral students may be supported by program creation proposals after the program has started admitting students. Financial support may only be provided to doctoral students that are U.S. citizens, nationals, or permanent residents. Student support must be included on the "stipends" line under the "Participant Support Costs" section of the budget. Stipends to students must not replace other need-based grants and scholarships already awarded to the students.

Funds may be used for supplies for research doctoral students, research doctoral student travel, research doctoral student professional development activities, hire faculty, curriculum development, mentoring training, seminar speakers, among other expenses to ensure the success of students. Current faculty, except for the PI, are not supported as mentoring research doctoral students is part of the faculty responsibilities.

Funds may not be used to support postdoctoral scientists or for the purchase of equipment, laboratory renovations, or other infrastructure.

The CREST Program encourages hiring faculty from groups underrepresented in STEM who are U.S. citizens, nationals, or permanent residents.

CREST-RISE supported personnel are expected to participate in principal investigator meetings and must include travel funds to attend these annual meetings in their budget.

CREST-RISE RAD

RAD awards will not exceed $1,000,000 during a five-year period.

Submission of a collaborative proposal from multiple organizations is not allowed. Proposals involving partnering organizations must use subawards made by the lead organization to partnering organizations. The total amount of funding to subawardee institutions must reflect the institution's effort. The total amount of funding to all subawardee institutions may not exceed 10% of the cumulative budget going to the primary institution, for example $200,000 for a $2,000,000 budget.

Funds cannot be used to support postdoctoral scientists.

Research doctoral students may be supported after the institution starts admitting doctoral students.

Funds will not be used for the purchase of equipment, laboratory renovations, or other infrastructure.

CREST-RISE supported personnel are expected to participate in principal investigator meetings and must include travel funds to attend these annual meetings in their budget.

CREST-RISE E&I

E&I awards will not exceed $500,000 during the one-year award period.

Submission of a collaborative proposal from multiple organizations is not allowed. Proposals involving partnering organizations must use subawards made by the lead organization to partnering organizations. The total amount of funding to subawardee institutions must reflect the institution's effort. The total amount of funding to all subawardee institutions may not exceed 10% of the cumulative budget going to the primary institution, for example $200,000 for a $2,000,000 budget.

Funds cannot be used to support postdoctoral scientists or students.

C. Due Dates

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

  August 02, 2024

  First Friday in August, 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?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationanc For Research.gov user support, call the Research.gov Help Desk at 1-800-381-1532 or e-mail rgov@nsf.gov. The Research.gov Help Desk answers general technical questions related to the use of the Research.gov system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: https://www.grants.gov/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 Bene ts from Research - NSF Strategic Plan for Fiscal Years (FY) 2022 - 2026*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and

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

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

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

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

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

Additional Solicitation Specific Review Criteria

Reviewers will be asked to consider the following:

For CREST-RISE DPSI

- Does the proposal present comprehensive plans for the recruitment, retention, and graduation of all doctoral students including those from groups underrepresented in STEM who are U.S. citizens, nationals, or permanent residents?
- Is the institutional support for and financial and organizational sustainability of the project adequate?

For CREST-RISE RAD

- What is the PI's mentoring experience?
- What is the potential of the PI to mentor graduate research doctorate students?

For CREST-RISE E&I

- Is the institutional financial and sustainability support for the equipment adequate?

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 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:

Recipients are required to use the NSF Education and Training Application (ETAP) to manage participants supported by CREST-RISE.

CREST-RISE supported personnel are expected to participate in principal investigator meetings and must include travel funds to attend these annual meetings in their budget.

Acknowledgment of Support and Disclaimer

All publications, presentations, and creative works based on activities conducted during the award must acknowledge NSF CREST-RISE support and provide a disclaimer by including the following statement in the Acknowledgements or other appropriate section:

"This material is based upon work supported by the National Science Foundation CREST-RISE under Grant No. (NSF Award number). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

C. Reporting Requirements

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

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

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

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

Additional Reporting Requirements:

PIs are required to include the outcomes summary table located in the CREST Program webpage as a support file in their project reports. No other support files are allowed.

PIs must include their unobligated balance in the Accomplishments section of the annual project report under the heading "What do you plan to do during the next reporting period to accomplish the goals?".

Program Evaluation

The Division of Equity for Excellence in STEM conducts evaluations to provide evidence on the impact of the EES programs on individuals' career progress, as well as professional productivity; and provide an understanding of the program policies in achieving the program goals. Additionally, it is highly desirable to have a structured means of tracking awardees to assess the impact the award has had on their career. Accordingly, support recipients may be contacted for updates on various aspects of their employment history, professional activities and accomplishments, participation in international research collaborations, and other information helpful in evaluating the impact of the program. Support recipients and their institutions agree to cooperate in program-level evaluations conducted by the NSF and/or contracted evaluators.

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:

- Sonal Dekhane, Program Director, telephone: (703)405-8977, email: sdekhane@nsf.gov
- Luis A. Cubano, Lead Program Director, telephone: (703) 292-7941, email: lcubano@nsf.gov
- Nicole E. Gass, Program Specialist, telephone: (703) 292-8378, email: ngass@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** (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
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