EPSCoR Research Infrastructure Improvement Program: Bridging EPSCoR Communities (RII-BEC)

PROGRAM SOLICITATION
NSF 22-536

National Science Foundation

Office of Integrative Activities

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

April 04, 2022

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 22-1), which is effective for proposals submitted, or due, on or after October 4, 2021.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

EPSCoR Research Infrastructure Improvement Program: Bridging EPSCoR Communities (RII-BEC)

Synopsis of Program:

The Established Program to Stimulate Competitive Research (EPSCoR) is designed to fulfill the mandate of the National Science Foundation (NSF) to promote scientific progress nationwide. Jurisdictions are eligible to participate in the NSF EPSCoR Research Infrastructure Improvement (RII) Program based on their level of total NSF support over their most recent five years (see RII eligibility). Through this program, NSF facilitates the establishment of partnerships among academic institutions and organizations in governmental, non-profit, and commercial or industrial sectors that are designed to effect sustainable improvements in a jurisdiction's research infrastructure, Research and Development (R&D) capacity, and hence, its R&D competitiveness.

In response to the American Rescue Plan Act of 2021 (H.R. 1319, sec. 7502), the National Science Foundation (NSF) established the EPSCoR Research Infrastructure Improvement Program: Bridging EPSCoR Communities (RII-BEC) initiative. The RII-BEC initiative seeks to enable institutions in EPSCoR jurisdictions to set up bridge programs to facilitate the transitions of Affected Groups (e.g., women, underrepresented groups, research trainees, and graduate fellows) from one stage of science, technology, engineering, and mathematics (STEM) training to the next, with particular focus on providing support for individuals from groups underrepresented in STEM and those transitioning from or to minority-serving institutions (MSIs) within EPSCoR jurisdictions.

The RII-BEC initiative will accept proposals that support those individuals most strongly affected by the pandemic at vulnerable career transition points (e.g., first two years of college, or preparation for entry into graduate programs and/or the STEM workforce) within EPSCoR jurisdictions. The RII-BEC initiative will provide up to $1,000,000 total per award for up to 5 years to support the strategic goal of reducing student attrition at these key junctures to improve future R&D competitiveness of EPSCoR jurisdictions. Proposals may include partnerships within and/or across two-year and four-year institutions (including community colleges). A key feature of projects will be a program strategy and plan for recruitment, mentoring, retention, and graduation of students (U.S. citizens, nationals, and permanent residents) in NSF-supported STEM fields, with specific efforts aimed at underrepresented groups in STEM.

The RII-BEC initiative is aligned with NSF's commitment to increase access for underrepresented groups to the Nation's STEM enterprise.

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.

- Andrea Johnson, telephone: (703) 292-5164, email: andjohns@nsf.gov

- Subrata Acharya, telephone: (703) 292-2451, email: acharyas@nsf.gov

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

- 47.083 --- Office of Integrative Activities (OIA)

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 10

Anticipated Funding Amount: $10,000,000

The estimated program budget, number of awards, and average award size/duration are subject to the scope of the project and availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Only institutions located in jurisdictions that meet the EPSCoR eligibility criteria and are one of the types of organization listed below may submit proposals to the Research Infrastructure Improvement Program Bridging EPSCoR Communities (RII-BEC) competition.

  Organizations located in RII-eligible jurisdictions:

  - Two- and four-year institutions of higher education (including community colleges), acting on behalf of their faculty members, that are accredited in and have a campus in the United States, its territories or possessions. Distinct academic campuses (e.g., that award their own degrees, have independent administrative structures, admissions policies, alumni associations, etc.) within multi-campus systems qualify as separate submission-eligible institutions. Campuses that plan to submit a proposal through the Sponsored Projects Office of other campuses or organizations should contact NSF to discuss eligibility as early as possible and at least six weeks before submitting such a proposal.
  - Not-for-profit, non-degree-granting domestic U.S. organizations, acting on behalf of their employees, that include (but are not limited to) independent museums and science centers, observatories, research laboratories, professional societies, and similar organizations that are directly associated with the Nation's research or educational activities. These organizations must have an independent, permanent administrative organization (e.g., an office of sponsored research) located in the United States, its territories or possessions, and have 501(c)(3) tax status.

Who May Serve as PI:

Principal Investigators (PIs) for RII-BEC projects must be employed by the fiscal agent/proposing organization within the submitting EPSCoR-eligible jurisdiction.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

Eligible individuals may serve as PI on only one RII-BEC project. There is no limit on the number of projects that an individual may be listed as co-PI.

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 FastLane: *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 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. submitter's local time):

  April 04, 2022

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

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

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

A. EPSCoR Mission and Goals

The mission of EPSCoR is to advance excellence in science and engineering research and education to achieve sustainable increases in research, education, and training capacity and competitiveness that will enable EPSCoR jurisdictions to have increased engagement in areas supported by NSF.

EPSCoR goals are the following:

- Catalyze the development of research capabilities and the creation of new knowledge that expands jurisdictions' contributions to scientific discovery, innovation, learning, and knowledge-based prosperity;
- Establish sustainable Science, Technology, Engineering, and Mathematics (STEM) education, training, and professional development pathways that advance jurisdiction-identified research areas and workforce development;
- Broaden direct participation of diverse individuals, institutions, and organizations in the project's science and engineering research and education initiatives;
- Effect sustainable engagement of project participants and partners, the jurisdiction, the national research community, and the general public through

data-sharing, communication, outreach, and dissemination; and
- Impact research, education, and economic development beyond the project at academic, government, and private sector levels.

B. Criteria for Eligibility to Participate in the Research Infrastructure Improvement Program: Bridging EPSCoR Communities (RII-BEC)

Research Infrastructure Improvement Program Bridging EPSCoR Communities (RII-BEC) eligibility is based on a jurisdiction's recent five-year history of total funds awarded by NSF relative to the Foundation's total research budget for that same period. The current table of eligible jurisdictions is available on the NSF EPSCoR website (See RII eligibility).

C. Research Infrastructure Improvement Program: Bridging EPSCoR Communities (RII-BEC)

The EPSCoR Research Infrastructure Improvement Program: Bridging EPSCoR Communities (RII-BEC) is an initiative within the Office of Integrative Activities (OIA) at the National Science Foundation (NSF) developed in response to American Rescue Plan Act of 2021. The goal of the program is to increase the retention and graduation rates of students disproportionately affected by the COVID-19 pandemic who are pursuing undergraduate and graduate degrees in STEM, particularly those individuals from groups underrepresented in STEM and those transitioning from or to MSIs within EPSCoR jurisdictions. The intent of the program is to strengthen the science and engineering (S&E) enterprise by enabling institutions in EPSCoR jurisdictions to create bridge programs to facilitate the transitions of Affected Groups from one stage of STEM training to the next.

II. PROGRAM DESCRIPTION

A. Overview

The EPSCoR RII-BEC initiative provides funds to EPSCoR-eligible two- and four-year academic institutions within EPSCoR jurisdictions to create bridge programs that will facilitate the transitions of Affected Groups (e.g., women, underrepresented groups, research trainees, and graduate fellows) from one stage of STEM training to the next, with particular focus on providing support for individuals from groups underrepresented in STEM and those transitioning from or to minority-serving institutions (MSIs) within EPSCoR jurisdictions. Proposers should collaborate with appropriate intra/inter-institutional partners as deemed appropriate for the success of the project. Project activities funded may include curricular alignment, dual enrollment programs, research experiences for undergraduate and graduate students, and development of effective institutional mentorship programs (e.g., student mentoring, tutoring, counseling, summer bridge programs, student professional/leadership development workshops) aimed at these key junctures. The program also encourages projects to develop mutually beneficial partnerships that build student opportunities to conduct research at partnering institutions.

Successful academic outcomes require supportive environments for students before, during, and after their transition. The establishment or inclusion of intentional institutional strategies aimed at creating a sense of belonging for students and addressing the mental and social well-being of students progressing through these transitions is encouraged. Innovative support structures and strategies that provide flexibility for students are encouraged (e.g., hybrid classes, eTutoring, virtual counseling, virtual internships). Proposers are required to evaluate the quality of programs and experiences that they develop to support the academic progression of their students affected by COVID-19, such as the ability to complete courses, transition from one academic level to another, and advance in their programs and careers in STEM.

Proposals should describe goals that are translated into a set of expected measurable outcomes that can be monitored using quantitative or qualitative approaches, or both. These outcomes should be used to track progress, guide the project, and evaluate its impact. The proposals should describe and develop instruments to assess whether those achievements can be attributed to the methods adapted or developed by the project. Projects should yield evaluation results sufficiently conclusive and descriptive so that successful strategies and interventions can be adopted and distributed nationally.

B. Project Focus

The RII-BEC initiative will provide new grants to enable institutions in EPSCoR jurisdictions to set up bridge programs to facilitate the transitions of Affected Groups from one stage of STEM training to the next. Proposals may include partnerships within and/or across two-year and four-year institutions (including community colleges). Inter-institutional partnerships should have in place a plan to develop articulation agreements or amend existing articulation agreements for the transfer of students from one institution to another that lead to STEM degree attainment. For intra-institutional partnerships, strategies should be developed to support students at critical transition points who will be transitioning from one level in their program to the next. These inter/intra-institutional partnerships and agreements should fit the needs and situations of the institutions involved. The proposed partnerships should be justified and be commensurate to the problem being addressed and resources available. The role of each partner should be explicitly described in the proposal and projects may involve any field of study supported by NSF. Enhancements and/or expansions to existing activities (including current NSF-funded programs/activities) are allowed, but they should be fully justified and described in the project description. Activities that merely duplicate existing programs should not be included as proposed activities to be supported by the project. However, jurisdictions are encouraged to leverage existing NSF-funded resources and activities.

The RII-BEC initiative supports mutually beneficial partnerships that generate new knowledge of effective ways to engage and retain undergraduate and graduate students in STEM and foster communication to encourage the formation and dissemination of new ideas, values, and learning. For all proposals, successful leadership/management teams will typically include current faculty members who teach STEM courses, STEM administrators, and researchers. The leadership/management teams should have representation from all institutional partners with explicit roles and responsibilities. Institutional partners may be budgeted as subawardees, if not the lead institution on a project. However, separately submitted collaborative proposals are eligible for consideration.

Projects are expected to identify and investigate factors, such as self-efficacy or identity, that affect transfer student success and subsequent graduation and have strong STEM faculty commitment and involvement. In addition, a mechanism should be described to track student outcomes, including outcomes following the students' completion of their programs. Projects are encouraged to establish processes and a management structure that support/manage project activities across the partner institutions.

Proposed projects may include the following:

- Academic support and activities that help students complete their degree programs
- Development of new curricular materials and methods of instruction that have the potential to improve student learning in STEM
- Development of innovative assessment tools to measure student learning
- Enhancement of the quality of the undergraduate and graduate STEM experience in a culturally relevant manner, including support for student research experiences, especially among members of underrepresented groups
- Alignment of STEM curriculum between two-year and four-year institutions, to support the transitions of students from Affected Groups, particularly

those transitioning from or to minority-serving institutions (MSIs) within EPSCoR jurisdictions
- Development of mentoring partnerships that enhance the research capabilities within and across EPSCoR institutions
- Opportunities for faculty to gain experiences with innovative, culturally relevant, and evidence-based teaching approaches

Project Evaluation: It is expected that all RII-BEC initiative proposals will include a project evaluation plan that includes metrics and milestones toward the achievement of project goals. The project evaluation plan should include indicators of success as defined by the project, as well as qualitative and quantitative measures that inform the reviewers about how the goals and specific objectives will be achieved. The expected outcomes and contributions should be relevant to the research knowledge base and/or educational practice. Meaningful evaluation of the project should be based on culturally appropriate metrics and include a logic model or other tools that connect the project goals to the specific activities, outputs, and outcomes.

Project evaluation plans should be appropriate to the size and scope of the project and will usually include both formative and summative components aligned with the evaluation questions of interest. A proposed timeline for the evaluation components should be included. The purpose of a formative evaluation is to provide information for project improvement. The purpose of a summative evaluation is to assess the quality and impact of a fully implemented project. Formative evaluation plans outline methods for documenting progress toward project goals and should include a feedback feature that allows for continuous improvement of the project activities. In some cases, formative evaluation may be internal to the project. A summative evaluation collects information about outcomes and related processes, strategies, and activities that have led to the demonstrated outcomes.

The budget must include adequate resources for the project evaluation. Project evaluation should be led by an independent, external evaluator or evaluation team, depending on the size and scope of the project. The external evaluator(s) may be financially compensated only as a consultant(s) (see V.B Other Budgetary Limitations, below). Evaluators are expected to adhere to the American Evaluation Association's Guiding Principles for Evaluators (https://www.eval.org), and project evaluations are expected to be consistent with standards established by the Joint Committee on Standards for Educational Evaluation (http://www.jcsee.org/program-evaluation-standards-statements).

The following references may be helpful in designing an evaluation plan:

- AAAS Measuring Diversity Report: https://www.nsfagep.org/evaluation-resources/
- Common Guidelines for Education Research and Development: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13126
- User-Friendly Handbook for Mixed Method Evaluations: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf97153
- Evidence: An Essential Tool Report: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf0531
- AIHEC Indigenous Evaluation Framework Report: https://portalcentral.aihec.org/Indigeval/Lists/IndigenousEvaluationFrmWork/AllItems.aspx
- Evaluation e-library of the American Evaluation Association Resource Library: https://www.eval.org/

III. AWARD INFORMATION

RII-BEC projects will be funded for up to $1,000,000 total per award with an award duration of up to 5 years. Approximately 10 awards are anticipated, pending the availability of funds. The estimated program budget, number of awards, and average award size/duration are subject to the scope of the project and availability of funds. Proposed budget should include funds for evaluation and required travel to NSF grantee meetings in Washington, DC.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Only institutions located in jurisdictions that meet the EPSCoR eligibility criteria and are one of the types of organization listed below may submit proposals to the Research Infrastructure Improvement Program Bridging EPSCoR Communities (RII-BEC) competition.

    Organizations located in RII-eligible jurisdictions:

    - Two- and four-year institutions of higher education (including community colleges), acting on behalf of their faculty members, that are accredited in and have a campus in the United States, its territories or possessions. Distinct academic campuses (e.g., that award their own degrees, have independent administrative structures, admissions policies, alumni associations, etc.) within multi-campus systems qualify as separate submission-eligible institutions. Campuses that plan to submit a proposal through the Sponsored Projects Office of other campuses or organizations should contact NSF to discuss eligibility as early as possible and at least six weeks before submitting such a proposal.
    - Not-for-profit, non-degree-granting domestic U.S. organizations, acting on behalf of their employees, that include (but are not limited to) independent museums and science centers, observatories, research laboratories, professional societies, and similar organizations that are directly associated with the Nation's research or educational activities. These organizations must have an independent, permanent administrative organization (e.g., an office of sponsored research) located in the United States, its territories or possessions, and have 501(c)(3) tax status.

Who May Serve as PI:

Principal Investigators (PIs) for RII-BEC projects must be employed by the fiscal agent/proposing organization within the submitting EPSCoR-eligible jurisdiction.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

Eligible individuals may serve as PI on only one RII-BEC project. There is no limit on the number of projects that an individual may be listed as co-PI.

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 FastLane, Research.gov, or Grants.gov.

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

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

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

See PAPPG Chapter II.C.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.

PROPOSAL REQUIREMENTS

The RII-BEC proposal must include the following sections:

a. **NSF Cover Sheet.** The project title must begin with "RII-BEC:" and follow with an informative title.
b. **Project Summary (1 page maximum).** Provide a clear overview of the proposed RII BEC project and its potential impact on underrepresented groups that are most strongly affected by the pandemic at vulnerable career transition points. Briefly describe the proposed scope, research, education, and broadening participation activities, and their integration. In separate labeled statements, provide a succinct summary of the intellectual merit and broader impacts of the proposed project.
c. **Table of Contents.** Generated automatically by the system.
d. **Project Description** (15 pages; including Results from Prior NSF Support): The Project Description must include a discussion of the broader impacts of the proposed activities as a separate section within the narrative labeled "Broader Impacts". In addition, the project narrative must include 1) an explanation of the project's motivating rationale, goals, objectives, deliverables, and activities; 2) a project timeline; 3) a plan that describes the strategies for recruitment, mentoring, and retention of Affected Groups, especially those underrepresented in STEM and those transitioning from or to minority-serving institutions (MSIs) within EPSCoR jurisdictions; 4) a management plan; 5) the roles and responsibilities of the PI, co-PI(s), and other senior personnel; 6) a plan for sustainability after the period of NSF funding; 7) an evaluation plan (see Project Evaluation under Section II); 8) a dissemination plan; and 9) results from prior NSF support (see PAPPG). Submission of the evaluation plan in supplementary documents is not allowable and such proposals will be subject to return without review as they will not meet the 15-page requirement. The proposal must address institutional support for, and sustainability of, the project. The external evaluator (external to the collaborating institutions) should be identified (see Project Evaluation under Section II). PIs are cautioned that the Project Description must be self-contained, and that URLs must not be used (see PAPPG Chapter II.C.2.d for additional information).
e. **References Cited** (no page limit): This section includes bibliographic citations only and does not provide parenthetical information outside of the 15-page Project Description. If the referenced document is readily available electronically, the website address should also be identified.
f. **Biographical Sketches.** Include biographical sketches for all key personnel including each faculty and equivalent-level participant according to standard NSF proposal guidelines contained in PAPPG Chapter II.C.2.f. It is permitted to include biographical sketches for any named collaborators ("Other Personnel") whose expertise is crucial to the success of the project, including the external evaluator(s). If doing so, these biographical sketches must be uploaded under Supplementary Documentation and they must conform to NSF guidelines for biographical sketches.
g. **Budgets and Budget Justification.**

   Complete budget pages are required for each year of support. The submitting (lead) organization must provide a complete budget justification that may not exceed five pages. A five-year cumulative budget will be automatically generated by the system. Separate budget and budget justification pages (not to exceed five pages) must also be provided for each organization receiving a subaward (see Section V. B. Budgetary Information for additional budget preparation instructions). Proposals that do not include separate budgets and budget justifications for each subawardee organization will be returned without review. For collaborative proposals submitted by multiple organizations, each organization must include a separate budget justification

of no more than five pages.

- h. **Current and Pending Support.** List current and pending support for each individual designated as senior personnel. See PAPPG Chapter II.C.2.h for additional information and guidance.
- i. **Facilities, Equipment and Other Resources.** Each partnering EPSCoR institution should provide a description of relevant available facilities, equipment, and other resources relevant to the project. See PAPPG Chapter II.C.2.i for additional information.
- j. **Special Information/Supplementary Documents**.
  - Postdoctoral Researcher Mentoring Plan (1 page; if applicable);
  - Data Management Plan (2 pages) (see link to NSF Data Management Plan Requirements at: https://www.nsf.gov/bfa/dias/policy/dmp.jsp); and
  - Letters of Collaboration (see the PAPPG for guidance). In addition to the PAPPG, the RII-BEC initiative requires that **only signed official letters** that document what is being committed that is of significance to the project should be included. Letters that merely endorse the project or offer nonspecific support for project activities should not be included and the proposal may be returned without review if general support letters are included.
- k. **Single Copy Documents:** Collaborators & Other Affiliations (COA) information specified in the PAPPG should be submitted using the instructions and spreadsheet template found at https://www.nsf.gov/bfa/dias/policy/coa.jsp.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

Proposals that do not adhere to the following budget guidelines may be returned without review:

- Funding requests must be for a duration of up to five (5) years and up to $1 million.
- There is no restriction on the amount requested annually, but the total request is limited to $1 million.
- While funds to purchase supplies to meet the project's goals are allowable, requests for the acquisition of equipment are not encouraged. If equipment is required for the fulfillment of the project goals, this should be discussed with the NSF Program Officer prior to submission of the proposal.
- Only the budget of the submitting organization may include subawards (i.e., no subawards may appear in the budgets of subawardee organizations).
- Subawards to organizations in non-EPSCoR jurisdictions are not permitted.
- Financial compensation for the external evaluator(s) must be included in the budget of the submitting organization under NSF budget line G.3 (Consultant Services). No other form of financial compensation for these services will be allowed.
- Budgets should include sufficient funding for participation in annual jurisdictional and regional EPSCoR conferences. In addition, budgets should request support for key personnel to participate in the annual PI meeting, and the biennial National EPSCoR Conference.
- EPSCoR funding must only be requested for and expended in EPSCoR jurisdictions. EPSCoR funding may not be used to support participants from non-EPSCoR jurisdictions. (This restriction does not preclude the involvement of non-EPSCoR participants when their participation does not incur significant additional costs).
- Proposal budgets must comply with guidance in the current *NSF Proposal and Award Policies and Procedures Guide*, with special attention given to rules for Participant Support (Line F on the Proposal Budget), especially with regard to gifts and entertainment. In general, costs of entertainment and amusement are unallowable and may not be requested. Additionally, jurisdictions submitting proposal budgets with Subawards (Line G5 on the Proposal Budget) must be able to verify that the lead institution has established a system to monitor the subawards issued on Federally-sponsored projects and that appropriate agreements are in place with subrecipients.

C. Due Dates

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

    April 04, 2022

D. FastLane/Research.gov/Grants.gov Requirements

For Proposals Submitted Via FastLane or Research.gov:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: https://www.fastlane.nsf.gov/a1/newstan.htm. To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For FastLane or Research.gov user support, call the FastLane and Research.gov Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov or rgov@nsf.gov. The FastLane and Research.gov Help Desk answers general technical questions related to the use of the FastLane and Research.gov systems. 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 the NSF FastLane system for further processing.

Proposers that submitted via FastLane or 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 *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. 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.C.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.C.2.d(i), prior to the review of a proposal.

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

In addition to the two NSF review criteria of demonstrating intellectual merit and broader impacts of the project, reviewers will be asked to consider the following:

1. Are there clear strategies for recruitment, mentoring, retention, and graduation of students in NSF-supported STEM fields, with specific efforts aimed at those underrepresented in STEM and those transitioning from or to MSIs within EPSCoR jurisdictions?
2. What is the evidence that the partnerships will fit the needs and situations within and/or across the institutions involved?
3. Will the project produce new knowledge (e.g., methods, processes, interventions, or models) that can increase the retention and graduation rates of STEM students, especially those underrepresented in STEM and those transitioning from or to minority-serving institutions (MSIs) within EPSCoR jurisdictions? In what ways will this project serve as a model of excellence in broadening participation within EPSCoR jurisdictions?
4. Does the project include appropriate short-term goals that are measurable and attainable within the project time frame? Is there a rigorous evaluation plan that includes culturally appropriate metrics and milestones toward the achievement of project goals, as well as a description of how formative evaluation will improve practice? Will the evaluation generate evidence to inform and document program sustainability?

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by 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 applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees 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 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 a Grants Officer in the Division of Grants and Agreements. 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.

Special Award Conditions:

Awardees are required to address the progress of evaluation efforts in their annual reports. A copy of the evaluator's report must be submitted with the annual report in years 1-5.

C. Reporting Requirements

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

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

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

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

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:

- Andrea Johnson, telephone: (703) 292-5164, email: andjohns@nsf.gov
- Subrata Acharya, telephone: (703) 292-2451, email: acharyas@nsf.gov

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188
- FastLane Help Desk e-mail: fastlane@nsf.gov
- 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.E.6 for instructions regarding preparation of these types of proposals.

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

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

> The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.
>
> To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at https://www.nsf.gov

- **Location:**   2415 Eisenhower Avenue, Alexandria, VA 22314

- **For General Information**   (703) 292-5111
  (NSF Information Center)**:**

- **TDD (for the hearing-impaired):**   (703) 292-5090

- **To Order Publications or Forms:**

      Send an e-mail to: nsfpubs@nsf.gov

      or telephone: (703) 292-8143

- **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 awardees 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 applicants 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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