Ideas Lab: Advancing Research Capacity at HBCUs through Exploration and Innovation (ARC-HBCU)

PROGRAM SOLICITATION
NSF 23-626

National Science Foundation
Office of Integrative Activities

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

December 19, 2023

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

April 24, 2024

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) that is in effect for the relevant due date to which the proposal is being submitted. The NSF PAPPG is regularly revised and it is the responsibility of the proposer to ensure that the proposal meets the requirements specified in this solicitation and the applicable version of the PAPPG. Submitting a proposal prior to a specified deadline does not negate this requirement.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Advancing Research Capacity at HBCUs through Exploration and Innovation (ARC-HBCU)

Synopsis of Program:

This solicitation invites participation in an Ideas Lab, which is an intensive, facilitated workshop that brings together multiple diverse perspectives to find innovative solutions to a grand challenge. This Ideas Lab will focus on exploration of innovative approaches for addressing the research capacity needs of the Nation's Historically Black Colleges and Universities (HBCUs) and development of collaborative networks among HBCUs that enable research in science, technology, engineering, and mathematics (STEM). The overarching aim of this Ideas Lab is to bring together HBCU faculty, staff, research administrators, and academic leadership to stimulate the generation and execution of innovative and transformative approaches for enhancing opportunities for HBCUs to finance and conduct STEM research. In alignment with recommendations from Preuss, Eck, Fechner, and Walker

(2020)[1], outcomes from this Ideas Lab should lead to new models and practices that sustainably increase research capacity by enabling inter-institutional and intra-institutional collaborations, sustainable institutional practices for facilitating project planning and development, increased and enhanced research infrastructure (human, cyber, and physical) through shared resourcing, and access to information, tools and resources that facilitate basic research in NSF-supported STEM fields.

This Ideas Lab is responsive to the National Science Board's (NSB) Vision 2030, which highlighted the importance of diversity in the STEM workforce . HBCUs account for 3% of four-year colleges in the United States, while conferring approximately 15% all STEM-related bachelor's degrees to Black/African American students. Approximately ~24% of Black/African American students who earned STEM doctoral degrees between 2015 and 2019 received their baccalaureate degree from an HBCU. Thus, HBCUs contribute significantly to training and developing the STEM workforce.

[1]. Preuss, M. Eck, K. Fechner, M. Walker, L. (2020) Research Development and Its Workforce: An Evidence-Based Compendium for Higher Education and Other Environments. International Journal on Studies in Education, 2 (1): 1-25.

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.

- Casonya M. Johnson, telephone: (703)292-2658, email: casjohns@nsf.gov

- Dina Stroud, telephone: (703)292-5015, email: dstroud@nsf.gov

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

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

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 1 to 4

Up to 4 awards.

Estimated number of awards and average award size/duration are subject to the quality of proposals and availability of funds. Funding requests can be for durations of up to 3 years.

Anticipated Funding Amount: $9,000,000

Estimated program budget is subject to availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Proposals may only be submitted by accredited HBCUs that have faculty members who conduct research in science and/or engineering and/or STEM education. Submission of proposals from a broad representation of HBCUs is encouraged, including HBCUs located in EPSCoR jurisdictions.

Who May Serve as PI:

The Principal Investigator must be employed full-time by the HBCU from which the proposal is submitted.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An individual may serve as PI or co-PI on only one Ideas Lab proposal in this competition but may serve as Other Senior Personnel on any number of Ideas Lab proposals in this competition.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required

- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.

- **Full Proposals:**

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

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

    December 19, 2023

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

    April 24, 2024

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

Standard NSF award conditions apply.

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

In addition to ensuring accessibility to and inclusivity in STEM, NSF's strategic objectives for 2022 – 2026 are to accelerate discovery and to advance the state of the art in research practice. Academic research is the main driver of fundamental discovery and basic research in the United States. The National Science Board (NSB) recognized the need to mitigate unintended barriers to research development and capacity in NSB Vision 2030. HBCUs make vital contributions to research and to increasing diversity in the STEM workforce. In 2022, the CHIPS and Science Act called for enhancing research capacity at HBCUs.

NSF continues its commitment to broadening participation and engaging a diverse and inclusive STEM workforce through workshops and funding opportunities that support research capacity and research initiation at HBCUs. As part of the ongoing effort to further empower STEM talent by increasing the involvement of communities underrepresented in STEM, this solicitation provides an opportunity to adopt novel, highly impactful, and efficient approaches for meeting the research development needs of HBCUs. By participating in this Ideas Lab, stakeholders at these institutions will have the opportunity to self-identify their most critical needs, and to develop and explore collaborative, synergistic approaches for addressing those needs.

The vision of this Ideas Lab is to develop sustainable networks that will address the research development and capacity needs of participating institutions by leveraging resources and expertise across multiple HBCU campuses to enable research in scientific disciplines that are supported by NSF (https://www.nsf.gov/about/research_areas.jsp).

Participation in the Ideas Lab requires an invitation in response to a preliminary proposal. Submission of a full proposal derived from the Ideas Lab requires both participation in the Ideas Lab and an invitation to submit a full proposal.

Full proposals derived from the Ideas Lab should have the potential to lead to a step-change, rather than incremental changes, in approaches for enhancing research capacity at under-resourced institutions and should include ideas that are broader in scope than those that can be funded by existing NSF programs. It is expected that these full proposals will be generated by teams of individuals from multiple HBCUs and with different institutional roles. To that end, applicants must provide at the preliminary proposal stage a description of the internal team who will actively facilitate implementation of the final project, if funded, at their respective institutions. Additionally, each full proposal submission must include a networking plan that will ensure equitable sharing of resources, tools, and information, and comparable impact in research and student training across all institutions in the proposed project.

II. PROGRAM DESCRIPTION

The Ideas Lab

An Ideas Lab is an interactive workshop on a focused problem and typically involves up to 30 participants. This Ideas Lab aims to stimulate the generation and execution of innovative and transformative approaches for strategically positioning HBCUs to finance and conduct research and to enact educational initiatives.

The Ideas Lab will run for five days starting mid-morning on Day One and finishing mid-afternoon on Day Five. At the outset, the participants will work collaboratively to identify and define the scope of the challenges faced by HBCUs in financing and conducting research. As the Ideas Lab progresses, participants will dynamically develop and hone novel ideas about how the identified challenges may be addressed. These ideas and approaches will be used in the development of collaborative research projects involving at least three institutions that are genuinely innovative and high risk. For this solicitation, **the research project is defined as an innovative approach for increasing research development, infrastructure, and capacity across institutional networks.** The Ideas Lab will include inputs from a variety of sources and will aim to develop innovative solutions that facilitate research capacity through networking and collaboration. Following the Ideas Lab, ideas submitted by teams may be invited for submission of collaborative full proposals.

How will the Ideas Lab Work?

The Ideas Lab is an intensive, interactive, and free-thinking environment, where a diverse group of participants from a range of disciplines and backgrounds gathers together for five days – away from their everyday worlds – to immerse themselves in collaborative thinking and come up with innovative approaches. Participants will be expected to engage constructively in dialogue with one another, the facilitators, and the Director(s) and Mentors to develop collaborative research proposals. Collaboration is an integral aspect of the Ideas Lab.

The nature of the Ideas Lab requires a high degree of trust among participants to make the required breakthroughs in scientific thinking. This trust extends to allowing the free and frank exchange of scientific ideas, some being in the very early stages of development. The discussion

should not be about ideas that are already well-developed but not yet published. Rather, the goal is to bring individuals from different disciplines together to interact and engage in free thinking based on first principles, to learn from one another, and to create an integrated vision for future research projects. It is expected that these ideas would be shared within the Ideas Lab, but their confidentiality would be respected outside the Ideas Lab.

The Ideas Lab will be led by a Director whose role is to assist in defining the topics and help facilitate discussions at the event. The Director will be joined by a small number of Mentors. The Director and Mentors will be selected by NSF based on their intellectual standing, their impartiality and objectivity, and their broad understanding of, and enthusiasm for, the subject area. The Director and Mentors will fully participate in the Ideas Lab but will not be eligible to receive research funding under this collaborative activity. They will therefore act as impartial peer reviewers in the process, providing a function analogous to that of an NSF review panel.

The process can be broken down into several stages:

- Defining the scope of the challenges;
- Evolving common languages and terminologies among people from a diverse range of backgrounds and disciplines;
- Sharing perspectives and understanding of the scientific challenges, as well as the diverse expertise brought by the participants to the Ideas Lab;
- Taking part in break-out sessions focused on the challenges, using creative thinking techniques;
- Capturing the outputs in the form of highly innovative research projects; and
- Using "real-time" peer review to develop projects at the Ideas Lab.

Participants will be expected to engage constructively in dialogue with one another, the facilitators, and the Director(s) and Mentors to develop collaborative research proposals. Collaboration is an integral aspect of the Ideas Lab. While the Ideas Lab will be an intensive event, for the well-being of participants, the venue that hosts the Ideas Lab will offer opportunities for relaxation, and the timetable will include networking and other activities as a break from the detailed technical discussions.

Who Should Apply to Participate?

Having the right mix of participants influences the success or failure of such an activity. Applications are encouraged from individuals representing the diversity of stakeholders at HBCUs, with either research, administrative, or teaching experiences that are relative to shaping fundamental and translational research capacity across the range of disciplines funded by NSF, including, biology, physics, biophysics, mathematical modeling, statistics, chemistry, engineering, STEM education, computer science, geoscience, and the social sciences. However, NSF is not defining the disciplines or job positions that should be represented at this Ideas Lab; rather potential participants are asked to indicate how their expertise can address the challenges associated with building research capacity and institutional collaboration.

The ability to develop and pursue a new approach will also be crucial. A broad range of expertise is required, and applicants should not feel limited by conventional perceptions: the Ideas Lab approach is about bringing together people who would not normally interact. We actively encourage applications from people who are experts in their own research areas but have not yet applied it to this challenge.

This is an opportunity to share ideas and develop future collaborations. Participants at any stage of their academic career are welcomed; however, they must be eligible to apply for funding from NSF.

Institutional Teams to Implement Activities that Enable Project Outcomes

It is anticipated that projects funded through this Ideas Lab will require institutional support and approval for full implementation and long-term evaluation of project outcomes, as well as an institutional team for each institution involved in the collaborative project. This institutional team will consist of members who will have authority and capacity to implement the project at their respective institution. Members of the institutional team can include any stakeholder in the institution, but at a minimum must include: at least one faculty member who is engaged in research that aligns with NSF's funding priorities; a member of the institution's sponsored projects office or other authorized organizational representative; a member of the institutional leadership team (Dean or higher) responsible for managing matters related to academic affairs; and a member of the institution leadership team responsible for managing matters related to institutional advancement. There is not a maximum number of team members. Applicants should assemble this team prior to submitting the preliminary proposal, and the institutional team can then determine how many team members will apply to attend the Ideas Lab. *Up to* two team members per institution will be invited.

Location and Date

This Ideas Lab will take place in person at an appropriate venue located in the vicinity of NSF headquarters in Northern Virginia from February 19 – 23, 2024. The environment will encourage free and open-minded thinking, which are vital for the success of such an event. Additional information about the venue and meeting logistics will be provided to the selected participants. All travel to the Ideas Lab, accommodation, refreshments, breakfast, lunch, and dinner costs will be covered by NSF. However, all incidental costs incurred while at the event will be borne by the participant.

Applying for this Activity

In brief, any individual interested in participating in the Ideas Lab should respond to this solicitation by submitting a preliminary proposal.

Participation in the Ideas Lab is by invitation only from the pool of applicants who submitted a preliminary proposal.

Submission of the preliminary proposal will be considered an indication of availability to attend and participate through the full course of the five-day residential workshop.

Participants will be selected based on their expertise, interests, and other characteristics described in their submitted preliminary proposals. The participants should be willing to engage in frank disclosure and assessment of ideas in a collegial, professional, and responsible fashion. An independent selection committee will recommend a list of potential participants from all submitters. NSF Program Officers, in consultation with the Ideas Lab Director and Mentors, will select the final list of participants from the submitted preliminary proposals.

Following the Ideas Lab, participants will be invited to submit to NSF full proposals, based on the outline developed at the Ideas Lab, by the April 24, 2024 deadline.

III. AWARD INFORMATION

Estimated program budget, number of awards, and average award size/duration are subject to the quality of proposals and availability of funds. Funding requests can be for durations of up to 3 years.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Proposals may only be submitted by accredited HBCUs that have faculty members who conduct research in science and/or engineering and/or STEM education. Submission of proposals from a broad representation of HBCUs is encouraged, including HBCUs located in EPSCoR jurisdictions.

Who May Serve as PI:

The Principal Investigator must be employed full-time by the HBCU from which the proposal is submitted.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An individual may serve as PI or co-PI on only one Ideas Lab proposal in this competition but may serve as Other Senior Personnel on any number of Ideas Lab proposals in this competition.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

Submission of Preliminary Proposals is required for participation in the Ideas Lab.

Please note, the preliminary proposal must come from one individual and cannot include co-PIs or collaborators.

Participants in the Idea Lab will be selected on the basis of information submitted in the preliminary proposal. The **Project Description** in the preliminary proposal submissions are limited to **two pages**. Standard NSF formatting guidelines apply. See the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) for guidance. Proposers are reminded to identify the program solicitation number (located on the first page of this document) in the Research.gov preliminary proposal set-up wizard and populated on the NSF Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines.

The Project Description section of the preliminary proposal application should conform to the following guidelines:

Page One:

- Certify the PI's availability for the February 19 – 23, 2024 Ideas Lab workshop by including the sentence, "I am available February 19 – 23, 2024 and can commit to attend all five (5) days of the workshop".

- Provide a brief summary of the PI's professional background, including their current position and role within the HBCU (no more than 100 words). Please note, if selected as a participant, information provided in answer to this question will be made available to the other participants to facilitate networking at the Ideas Lab workshop.
- Provide a statement explaining how the PI sees their expertise and interests contributing to realizing the workshop goal of developing and exploring collaborative, synergistic approaches for addressing the research development and capacity needs of HBCUs (no more than 150 words).
- Provide a statement that addresses both of the following questions. (a) What current research & development infrastructure activities at the PI's institution can be enhanced or further developed to expand research capacity on campus? (b) How might existing resources at the PI's institution be reimagined or redistributed so that they can be shared across institutions, while also better serving the needs of STEM researchers on campus? (no more than 300 words).

Page Two:

- Provide a description of the institution's implementation team. It is acceptable to provide this information in a table or chart, or as a list. Be sure to include information about each individual's current position at the institution and the expertise that they provide for facilitating implementation.
- Provide a response to the following questions, limiting the response to each question to 150 words. The responses will help the program assess the PI's suitability (unrelated to the PI's research track record) for the innovative and collaborative setting of this intensive, interactive, fast-paced event. The word "you" or "your" in the questions below refer to the PI of the preliminary proposal.
  - What is your approach to teamwork and what strengths do you bring to a team effort?
  - This workshop is especially suited to individuals who enjoy stepping outside their areas of expertise or interest, are positively driven, enjoy creative activity, and can think innovatively. It is an intensive setting requiring you to develop novel approaches with individuals you may not know. How do you see your expertise and interests contributing to this activity and realizing the overall goal of this Ideas Lab solicitation?
  - What do you hope to gain from participating in this workshop, personally and professionally?

Submitters should not submit a budget. Submitters must, however, include a "Biographical Sketch" and a "Current and Pending (Other) Support" document (prepared in accordance with standard NSF formatting guidelines).

No appendices or supplementary documents may be submitted.

Submission of the preliminary proposal will be considered an indication of commitment to attend and participate through the full course of the five-day residential Ideas Lab workshop on February 19 – 23, 2024, should the proposer be invited. The decisions of NSF about whom to invite to participate will be final and binding.

Following the conclusion of the Ideas Lab, NSF Program Officers will invite the submission of full proposals related to one or more of the ideas developed during the Ideas Lab. Submission of a full proposal derived from the Ideas Lab requires both participation in the Ideas Lab and an invitation to submit a full proposal.

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

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

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

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

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

Special instructions for submitting full proposals to this solicitation.

Full proposals based on project ideas developed through interactions at the Ideas lab should conform to the project outline developed at the conclusion of the workshop. If substantive changes are contemplated, a cognizant NSF Program Officer should be contacted for guidance.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

Funding requests can be for durations of up to 3 years.

If the proposal is being submitted as a "Submission of a collaborative proposal from multiple organizations," follow the instructions in PAPPG Chapter II.D.3 regarding budget submissions.

Financial compensation for any independent evaluator(s) involved in the project must be included in the budget of the submitting organization under Consultant Services. No other form of financial compensation for external evaluation services is allowed.

C. Due Dates

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

    December 19, 2023

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

    April 24, 2024

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

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

For Proposals Submitted Via Grants.gov:

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

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

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

This activity, particularly the Ideas Lab approach, is designed to foster the development and implementation of creative and innovative project ideas that have the potential to transform research paradigms or solve previously intractable problems. We anticipate that awards made through this solicitation will be high-risk/high-impact, as they represent new and unproven ideas, approaches, or technologies. Projects that involve the application of novel, collaborative, or interdisciplinary approaches will therefore receive priority during the consideration process. In addition, full proposals derived from the Ideas Lab will be evaluated to determine whether the themes and objectives in the proposal are congruent with the ideas presented at the Ideas Lab, and whether any significant changes in project scope or resources from those presented at the Ideas Lab have been justified.

B. Review and Selection Process

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

The competition will be consistent with the guidelines for an Ideas Lab described in PAPPG Chapter II.F.6.

Stage 1. Selection of Participants:

NSF Program Officers will convene a panel of internal and external reviewers to review preliminary proposals and advise on the selection of participants in the Ideas Lab. This group will comprise of individuals who will be barred from receiving any research funding through, or in any other way collaborating on, the Ideas Lab. These individuals will be subject matter experts with relevant expertise in the Ideas Lab topic of developing and exploring collaborative, synergistic approaches for enhancing research development/capacity. Final selection decisions regarding participation in the Ideas Lab workshop will be made by NSF.

Overall, the panel will seek to ensure that a balance of expertise and experience is present at the Ideas Lab workshop; their assessment will be based on the specific criteria outlined below:

- ability to develop new and highly original research ideas;
- potential to contribute to research between disciplines; and
- ability to work in interdisciplinary teams.

Stage 2. Ideas Lab:

Applicants selected by NSF will participate in the Ideas Lab workshop, building collaborations and refining ideas. Organizing NSF Program Officers will select up to 6 qualified persons to serve as Mentors during the Ideas Lab workshop. This group will be comprised of individuals who will be barred from receiving any research funding through, or in any other way collaborating on, the Ideas Lab. These individuals will be subject matter experts from diverse disciplines pertinent to the topic of the Ideas Lab. One of the Mentors will act as the Director of the workshop and will be responsible for leading the activities of the Mentors.

Anonymous real-time peer review involving the participants and the Mentors will be incorporated into the workshop, providing iterative constructive feedback during the development of project ideas. The workshop will use a team of facilitators to guide the creation of interdisciplinary teams and the creative development of ideas, and to ensure that the workshop progresses in a productive manner. At the end of the workshop, the Mentors will provide a consensus report summarizing their evaluation of each project idea. The recommendations of the Mentors are advisory to NSF. Informed by their advice, within seven to fourteen days following the workshop, NSF Program Officers will consider which projects to invite for submission as full proposals. NSF may invite some, all, or none of the Ideas Lab projects for full proposal submission. By March 8, 2024, NSF Program Officers will invite selected Ideas Lab participants to submit a full proposal and provide guidance for the full proposal submission. These invited full proposals must be prepared according to standard NSF *Proposal & Award Policies & Procedures Guide*.

It is anticipated that these full proposals developed through the Ideas Lab workshop will feature the following:

- Novel, potentially transformative projects that clearly reflect the distinctive opportunity for creating novel approaches for capacity building at HBCUs;
- Clear evidence that all institutions involved in a single project have the capability to implement the planned activities, with compelling plans for assessment of project outcomes; and
- Clear relevance and potential to make a sustainable impact on the institutions' research capacity at a scale and speed that will potentially be amendable for implementing at other underserved institutions.

Stage 3. Review and recommendation of full proposals:

NSF-invited full proposals arising from the Ideas Lab will be submitted *via* Research.gov or Grants.gov by April 24, 2024. NSF-invited proposals will be reviewed internally by the cognizant NSF Program Officers and other external reviewers, as appropriate.

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

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

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

agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

Administrative and National Policy Requirements

Build America, Buy America

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

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

C. Reporting Requirements

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

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

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

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

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:

- Casonya M. Johnson, telephone: (703)292-2658, email: casjohns@nsf.gov

- Dina Stroud, telephone: (703)292-5015, email: dstroud@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-381-1532

- Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

> The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and

cooperative agreements for research and education in the sciences, mathematics, and engineering.

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

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

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

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

- **To Order Publications or Forms:**

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

    or telephone: (703) 292-8134

- **To Locate NSF Employees:**   (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

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

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