Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)

PROGRAM SOLICITATION
NSF 20-559

REPLACES DOCUMENT(S):
NSF 18-522

National Science Foundation

Directorate for Education and Human Resources
Division of Human Resource Development

Letter of Intent Due Date(s) ***(required)*** (due by 5 p.m. submitter's local time):

July 28, 2020

Fourth Tuesday in July, Annually Thereafter

Research Initiation Awards

September 08, 2020

Second Tuesday in September, Annually Thereafter

Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects

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

March 22, 2022

Broadening Participation Research Centers

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

October 06, 2020

First Tuesday in October, Annually Thereafter

Research Initiation Awards

November 12, 2020

Second Thursday in November, Annually Thereafter

Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects

November 22, 2022

Broadening Participation Research Centers

IMPORTANT INFORMATION AND REVISION NOTES

The HBCU Excellence in Research (HBCU EiR) track has been removed from the HBCU-UP solicitation. HBCU EiR now is announced in a new solicitation NSF 20-542.

Minor modifications have been made in the section V. Proposal Preparation and Submission Instructions.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 20-1), which is effective for proposals submitted, or due, on or after June 1, 2020.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Historically Black Colleges and Universities - Undergraduate Program (HBCU-UP)

Synopsis of Program:

HBCU-UP provides awards to strengthen STEM undergraduate education and research at HBCUs. Support is available through the following tracks:

- **Targeted Infusion Projects (TIP)**, which provide support to achieve a short-term, well-defined goal for improving the quality of undergraduate STEM education at HBCUs.
- **Broadening Participation Research (BPR**) in STEM Education projects, which provide support for research that seeks to create and study new theory-driven models and innovations related to the participation and success of underrepresented groups in STEM undergraduate education.
- **Research Initiation Awards (RIA)**, which provide support for STEM faculty with no prior or recent research funding to pursue research at the home institution, a NSF-funded research center, a research intensive institution, or a national laboratory.
- **Implementation Projects (IMP)**, which provide support to design, implement, study, and assess comprehensive institutional efforts for increasing the number of students receiving undergraduate degrees in STEM and enhancing the quality of their preparation by strengthening STEM education and research. Within this track, **Achieving Competitive Excellence (ACE) Implementation Projects** are intended for HBCUs with exemplary achievements and established institutionalized foundations from previous Implementation Project grants.
- **Broadening Participation Research Centers (BPRC)**, which provide support to conduct broadening participation research at institutions that have held three rounds of Implementation or ACE Implementation Projects and with demonstrated capability to conduct broadening participation research. Broadening Participation Research Centers are expected to represent the collective intelligence of HBCU STEM higher education, and serve as national hubs for the rigorous study and broad dissemination of the critical pedagogies and culturally sensitive interventions that contribute to the success of HBCUs in educating African American STEM undergraduates. Centers are expected to conduct research on STEM education and broadening participation in STEM; perform outreach to HBCUs in order to build capacity for conducting this type of research; and work to disseminate promising broadening participation research in order to enhance STEM education and research outcomes for African American undergraduates across the country.
- **Other Funding Opportunities** include EArly-Concept Grants for Exploratory Research (EAGER), Rapid Response Research (RAPID), conference, and planning grants.

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.

- Claudia M. Rankins, Program Director, telephone: (703) 292-8109, email: crankins@nsf.gov
- Michelle O. Claville, Program Director, telephone: (703) 292-7751, email: mclavill@nsf.gov
- Earnestine Easter, Program Director, EHR/DGE, telephone: (703) 292-8112, email: epsalmon@nsf.gov
- Emanuel Waddell, Program Director, telephone: (703) 292-4644, email: ewaddell@nsf.gov
- Toni Edquist, Program Specialist, EHR/HRD, telephone: (703) 292-4649, email: tedquist@nsf.gov

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

- 47.076 --- Education and Human Resources

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 115

115 awards are expected to be made over a two-year period as follows:

In FY 2021, up to 22 Targeted Infusion Projects, up to 6 Broadening Participation Research Projects, up to 6 Implementation Projects, one ACE Implementation Project, and up to 22 Research Initiation Awards.

In FY 2022, up to 22 Targeted Infusion Projects, up to 6 Broadening Participation Research Projects, up to 6 Implementation Projects, one ACE Implementation Project, up to 22 Research Initiation Awards, and one Broadening Participation Research Center.

Anticipated Funding Amount: $55,000,000

$55 million, pending availability of funds, are expected to be spent for new awards over the two-year period as follows:

Approximately $27 million, pending availability of funds, for new awards in FY 2021 for Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Project, Research Initiation Awards, and unsolicited proposals.

Approximately $28 million, pending availability of funds, for new awards in FY 2022 for Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Project, Research Initiation Awards, Broadening Participation Research Center, and unsolicited proposals.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- **HBCU-UP Proposals:** Historically Black Colleges and Universities (HBCUs) that are accredited and offer undergraduate educational degree programs in science, technology, engineering and mathematics (STEM).

Who May Serve as PI:

- The Principal Investigator for a **Targeted Infusion Project** must be the individual who will direct the implementation of the project activities.
- The Principal Investigator for a **Broadening Participation Research Project** must be responsible for managing the project and must be one of the key researchers. At least one of the Principal Investigators must have experience in education or social science research.
- The Principal Investigator for a **Research Initiation Award** must be a faculty member in a STEM or STEM education discipline at the HBCU. Co-Principal Investigators and senior personnel are not permitted.
- The Principal Investigator and co-Principal Investigators for an **Implementation Project, ACE Implementation Project, or a Broadening Participation Research Center must** be the key personnel that will be responsible for guiding the implementation of the project or Center.

Limit on Number of Proposals per Organization:

HBCU-UP Proposals:

- An eligible institution can submit only one Implementation Project or ACE Implementation Project proposal per year. An institution may have only one active Implementation Project or ACE Implementation Project award. However, a new proposal can be submitted by an institution with an active project if that project is due to expire before new awards will be made. Also, an institution can be awarded, at most, three Implementation Projects and one ACE Implementation Project over time.
- An eligible institution can submit only one Broadening Participation Research Center proposal and can have only one active center. The lead institution of the center proposal must have been awarded three rounds of an Implementation or ACE Implementation Project and must demonstrate the capacity to conduct broadening participation research.
- An eligible institution can submit no more than two Broadening Participation Research proposals per year.
- An eligible institution can submit no more than two Targeted Infusion Project proposals per year and can only have one active Targeted Infusion Project for any given department or unit.
- An eligible institution can submit no more than two Research Initiation Award proposals per year.

Limit on Number of Proposals per PI or Co-PI: 2

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

Letter of Intent Due Date(s) *(required)* (due by 5 p.m. submitter's local time):

July 28, 2020

Fourth Tuesday in July, Annually Thereafter

Research Initiation Awards

September 08, 2020

Second Tuesday in September, Annually Thereafter

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March 22, 2022

Broadening Participation Research Centers

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

October 06, 2020

First Tuesday in October, Annually Thereafter

Research Initiation Awards

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Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects

November 22, 2022

Broadening Participation Research Centers

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

The Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) is managed by the Division of Human Resource Development in the Directorate for Education and Human Resources. HBCU-UP is committed to enhancing the quality of undergraduate STEM education and research at Historically Black Colleges and Universities (HBCUs) as a means to broaden participation in the nation's STEM workforce. HBCU-UP seeks to work towards this goal by providing awards to develop, implement, and study innovative approaches for making dramatic improvements in the preparation and success of HBCU undergraduate students so that they may participate successfully in graduate programs and/or careers in science, technology, engineering and mathematics (STEM) disciplines.

HBCUs have awarded a large share of bachelor's degrees earned by African American students in STEM. In addition, eleven of the top fifteen baccalaureate institutions of African American STEM doctorate recipients from 2013 to 2017 are HBCUs.[1] In 2017, 11.4% of Black undergraduates attended HBCUs,[2] and HBCUs awarded 14.8% of the bachelor's degrees to Black students. 15.6% of the science, and 17.2% of the engineering bachelor's degrees were earned by Black graduates in the U.S. that year.[1]

To meet the nation's accelerating demands for STEM talent, higher education needs more rapid gains in achievement and successful degree completion in STEM for underrepresented minority populations. HBCU-UP is designed to enhance the quality of both undergraduate STEM education and research at HBCUs as a means to broaden participation in the nation's STEM workforce.

HBCU-UP has identified the following priority areas: innovation in instruction and curriculum development; access to STEM research experiences for undergraduate students; recruitment and retention, especially retention in STEM fields during and after the freshman year; critical transitions from K-12 to undergraduate, 2-year to 4-year, and undergraduate to graduate school; increased research capacity of STEM faculty; evidence-based leadership and professional development of faculty; research capacity building; and STEM teacher preparation.

HBCU-UP welcomes proposals that will pair well with the efforts of NSF INCLUDES (https://www.nsf.gov/news/special_reports/nsfincludes/index.jsp) to develop STEM talent from all sectors and groups in our society. Collaborations are encouraged between HBCU-UP proposals and existing NSF INCLUDES projects, provided the collaboration strengthens both projects.

HBCU-UP supports NSF efforts in all areas of research, but welcomes proposals that support NSF's 10 Big Ideas and position HBCUs to be competitive in these areas of research. https://www.nsf.gov/news/special_reports/big_ideas/.

According to National Science Foundation data[1] for the year 2016, Black students comprise 2.1% of the B.S. degree recipients in the geosciences, 3.1% in physics and 3.9% in engineering, while Blacks comprise 14.8% of the college-aged population (assuming an 18-24 year population). There is a role for HBCUs to play in increasing their nation-wide representation in these particular fields. Therefore, HBCU-UP encourages the submission of innovative projects that offer solutions to the severe underrepresentation of African American students in engineering, the geosciences and physics at the undergraduate level.

HBCU-UP's priorities and efforts to accelerate the quality and effectiveness of the education of undergraduate students at HBCUs are in alignment with findings and recommendations in a number of reports and documents[3,4,5,6,7]. These reports outline the importance of the undergraduate experience for preparing a diverse and highly skilled STEM workforce, and a STEM-literate public ready to support and benefit from the progress of science, as well as the importance of preparing STEM teachers for the K-12 level. The call for Broadening Participation Research Centers and research in broadening participation aligns with the recommendation in the report[8] from the Committee on Equal Opportunities in Science and Engineering to "better address emerging challenges and opportunities and the limited progress being made in improving broadening participation in STEM".

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[1] National Science Foundation, National Center for Science and Engineering Statistics. 2017. Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017, Special Report NSF 17-310. Arlington, VA. Available from https://www.nsf.gov/statistics/wmpd/.

[2] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. 2014. Digest of Education Statistics. NCES 2016-006. Washington, DC. Available from: https://nces.ed.gov/pubs2016/2016006.pdf.

[3] National Academies of Sciences, Engineering, and Medicine. 2019. *Minority Serving Institutions: America's Underutilized Resource for Strengthening the STEM Workforce*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25257.

[4] National Academies of Sciences, Engineering, and Medicine. 2016. *Barriers and Opportunities for 2-Year and 4-Year STEM Degrees: Systemic Change to Support Students' Diverse Pathways*. Washington, DC: The National Academies Press. Available from: https://doi.org/10.17226/21739.

[5] Members of the Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline. 2010. NAS Report. Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads. ISBN: 0-309-15969-5. Available from: http://www.nap.edu/catalog/12984.html.

[6] National Academies of Sciences, Engineering, and Medicine. 2017. *Undergraduate Research Experiences for STEM Students: Successes, Challenges, and Opportunities*. Washington, DC: The National Academies Press. Available from: https://doi.org/10.17226/24622

[7] National Research Council. 2012. Discipline-based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering. Washington, DC: National Academies Press. Available from: http://www.nap.edu/catalog.php.

[8] Committee on Equal Opportunities in Science and Engineering. 2013. 2011-2012 Biennial Report to Congress: Broadening Participation in America's STEM Workforce. Available from: https://www.nsf.gov/od/iia/activities/ceose/reports/Full_2011-2012_CEOSE_Report_to_Congress_Final_03-04-2014.pdf.

II. PROGRAM DESCRIPTION

The Historically Black Colleges and Universities - Undergraduate Program provides support for Targeted Infusion Projects, Broadening Participation Research Projects, Research Initiation Awards, Implementation Projects/Achieving Competitive Excellence Implementation Projects, and Broadening Participation Research Centers.

1. TARGETED INFUSION PROJECTS: Projects of two to three years targeted for short-term, well-defined goals to improve the quality of and make innovations in undergraduate STEM education at HBCUs.

Targeted Infusion Projects are expected to build knowledge with respect to STEM education. Projects must describe and make a strong case for how a project advances the knowledge base in STEM education through research, evaluation or a combination of research and evaluation processes. The theoretical and empirical justification for the proposed project must be clearly articulated.

Targeted Infusion Projects could adapt evidence-based learning experiences and pedagogies in STEM fields. Projects could develop creative uses of cyberlearning. Projects could enhance academic infrastructure by updating curricula, modernizing laboratory research equipment, or improving the computational network array supporting research and education. Projects could enhance existing degree programs, establish new degree programs or concentrations, secure specialized accreditation or certification, or infuse STEM programs with disciplinary field advances and evolving workforce requirements. Projects that develop faculty expertise, promote implementation of educational innovations, or focus on the preparation of future K-12 teachers are encouraged. Projects should be guided by research on teaching and learning.

Competitive proposals will describe clearly the innovation in undergraduate STEM education the project will realize. Appropriate short-term goals should be easily measurable and attainable within the project time frame, and appropriate metrics should be identified. The proposal also should include activities for dissemination of project results.

HBCUs that currently have a five-year Implementation Project will need to explain how the Targeted Infusion Project differs from the Implementation Project activities and how the HBCU-UP funded projects will be leveraged, integrated, or synergized to produce greater outcomes that could not be achieved separately.

2. BROADENING PARTICIPATION RESEARCH IN STEM EDUCATION PROJECTS: Projects of up to three years to investigate topics that impact the recruitment, retention, and success of African Americans in STEM education and the workforce.

Broadening Participation Research proposals in STEM Education may investigate behavioral, cognitive, affective, learning and social differences, as well as organizational, institutional or systemic processes that may impact participation and success in STEM education. Successful proposals will be grounded in appropriate theory and incorporate recent innovations and advances in research methodologies, conceptual frameworks, and/or data gathering and analytic techniques. Proposals should reflect relevant advances in quantitative, qualitative, and mixed-methods research and evaluation methodologies and provide a compelling argument about how the proposed methodologies are appropriately matched with the strategic research questions of the project. Additionally, proposals should demonstrate how the methods chosen will result in rigorous, cumulative, reproducible, and usable findings to merit peer-review and publication.

Broadening Participation Research proposals must include PIs with demonstrable expertise in education research and/or social science research methods and knowledge about STEM programs at HBCUs. Proposers are encouraged to establish collaborations to strengthen the research project and describe in the proposal the nature of the collaboration and the anticipated benefits. As appropriate, proposals should describe mechanisms to transfer findings into educational practice for use by other researchers and policymakers.

3. RESEARCH INITIATION AWARDS: Projects of up to three years to perform scientific research.

Research Initiation Awards provide support for a STEM faculty member at the HBCU to pursue research at either the home institution, an NSF-funded Center, a research intensive institution, or at a national laboratory. The project description should contain all of the elements of a standard NSF research proposal. The project should further the faculty member's research capability and effectiveness, improve research and teaching at the home institution, and involve undergraduate students in research experiences. Research Initiation Awards are for faculty who are starting to build or are rebuilding a research program. Faculty members who hold or have held an external research award within the last three years are not eligible for the Research Initiation Award.

4A. IMPLEMENTATION PROJECTS: Projects up to five years to advance institution-wide, undergraduate STEM education and research.

Implementation Projects provide support to design, implement, study, and assess comprehensive institutional efforts to increase the numbers of students pursuing STEM degrees and the quality of their preparation. Implementation projects should create and/or adapt and assess evidence-based models and materials for teaching and learning in STEM, embody knowledge about how students learn most effectively in STEM teaching and learning activities, and bring STEM disciplinary advances into the undergraduate experience. Proposers are encouraged to analyze the strengths and potential of the institution in STEM. Based on this analysis, they should design and/or adapt innovative educational strategies that are appropriate in content and context for increasing the capacity and effectiveness of the institution to attract, retain, educate, and train students from groups underrepresented in STEM and prepare them to succeed in graduate school or the workforce. Transferability and dissemination of successful models, effective methods, and innovative materials for educating undergraduate STEM students are critical aspects of implementation projects.

Innovative models and tools for STEM teaching and learning developed through an Implementation Project should be part of comprehensive institutional reform to enhance STEM teaching and learning, and improve student access and retention in STEM areas. The implementation design should apply research-based practices to produce significant improvements in undergraduate STEM education and research programs at the institution. Project components may include, but are not limited to: Developing and assessing innovative STEM curriculum teaching and learning techniques; using cyberinfrastructure for anytime, anywhere, anyone learning; providing novel undergraduate student development activities and educational enrichment activities; enhancing undergraduate student research experiences; providing activities that promote the development of a globally engaged workforce, including international research experiences for undergraduate students and faculty; creating new approaches to recruit and retain undergraduate STEM students; providing faculty professional development in effective STEM teaching, pedagogy, and research; providing opportunities and mechanisms for faculty, especially new faculty, to establish a research program; preparing K-12 STEM teachers; addressing the critical transitions from K-12 to undergraduate, 2-year to 4-year, and undergraduate to graduate; and implementing other activities that enhance the quality and competitiveness of undergraduate STEM programs. Implementation Projects should establish sustainable practices that prepare students to compete successfully for graduate research fellowships. Efforts should be made to increase the number of students submitting competitive applications to the NSF Graduate Research Fellowship, as well as other competitive fellowship programs. The recruitment and retention of veterans in STEM fields as a means to diversify

and increase the STEM workforce is encouraged.

NSF expects that the activities and strategies included in Implementation Project proposals will be consistent with and complementary to the institution's STEM needs, long-term goals, and mission. NSF, therefore, allows maximum flexibility in the design of Implementation Projects under HBCU-UP. The proposal, however, must fully substantiate the rationale for choosing the desired approach. The project scope should depend on the size and number of STEM departments or programs at the institution and be defined by the complexity of the proposed activities in the project design. Ideally, the implementation project would impact all the STEM undergraduate programs, STEM students, and STEM faculty at the institution. The project plan should be clearly described, detailing measurable outcomes for STEM students (e.g. number and types of high quality research experiences, number of students going on to graduate school or the workforce) and faculty (e.g. number of publications) of the proposed HBCU-UP activities. The proposal should include compelling arguments for why the practices and strategies implemented in the specific institutional environment are expected to result in the anticipated outcomes. The proposal also should include activities for scholarly dissemination of project results and processes to inform the broader community about the effectiveness of specific implementation strategies.

If an institution has previously received an Implementation Project grant, it is critical that the proposal for another Implementation Project provide complete information on the outcomes and impact of the previous HBCU-UP project, including a description of what was learned from the previous activities, how these findings were disseminated to the broader community, and how successful activities are being sustained at the institution. Implementation proposals from past awardees must not simply propose to continue the activities of the previous Implementation Project grant. The new proposal should be based on a thorough evaluation of the previous HBCU-UP project and an assessment of the current state of the institution so that a new project can build on progress and achievements and identify new innovations undertaken to move the institution into the next level of STEM program competitiveness. The proposal should include a component that outlines a strategy for the creative integration of NSF-funded awards at the institution that are related to the proposed project's goals and scope.

Proposals for a second round or subsequent Implementation Project must include a research project that is linked to the proposed interventions and strategies to formally study such strategies in the particular setting of the HBCU. Projects may offer a postdoctoral research fellowship to a social science or educational researcher to provide opportunities early in his or her career and to work with this research project.

4B. ACHIEVING COMPETITIVE EXCELLENCE (ACE) IMPLEMENTATION PROJECTS: Five-year, institution-wide, sustainable and potentially transformative projects that advance STEM education and research.

Institutions that have had previous Implementation Project grants should be able to exhibit an established foundation and to provide evidence of institutionalized achievements toward the HBCU-UP goals and objectives. As a result, growth in competitiveness of these HBCU-UP institutions should be reflected in the readiness of faculty and institution leadership to move to the next level of excellence. The ACE Implementation Project track is intended for HBCUs exhibiting these qualities as a result of previous Implementation Project grants. The goal of the ACE program is to help institutions to bolster their capacity and move onto the national landscape in undergraduate STEM education and research. ACE projects are ambitious, potentially transformative proposals that have the promise of significant advances in STEM undergraduate education at the institution. ACE projects should create more and varied pathways to success for STEM students by increasing intellectual and evidence-based resources. Possible approaches might include: establishing new collaborations and alliances with public and private research institutions, centers, and national laboratories; providing access to tomorrow's science through computationally intensive tools and global networks; establishing international collaborations to enhance undergraduate student and faculty research; or increasing fiscal resources for frontier STEM education and research through innovative institutional integration, leveraging partnerships, and strong linkages with business and industry. Institutions submitting an ACE Implementation Project must include a component that outlines a strategy for the creative integration of NSF-funded awards at the institution that are related to the proposed project's goals and scope, and that describes how the institution thinks strategically about moving forward in STEM education and research.

ACE Implementation Projects must include a research project that is linked to the proposed approaches and interventions to formally study such approaches in the particular setting of the HBCU. Projects may offer a postdoctoral research fellowship to a social science or educational researcher to provide opportunities early in his or her career and to work with this research project.

5. BROADENING PARTICIPATION RESEARCH CENTERS: Five-year projects that build the intellectual infrastructure to facilitate the creation, integration, and transfer of new knowledge in broadening participation research.

Institutions that have been awarded three previous Implementation or ACE Implementation Projects are eligible to be the lead institution to submit a proposal for a Broadening Participation Research Center (BPRC). BPRCs conduct research through partnerships as appropriate. BPRCs are expected to establish a culture in broadening participation research that will add to the research knowledge base and enhance understanding of the barriers that hinder and factors that enhance our ability to broaden participation in STEM. The results of these efforts will inform approaches to increase the access and involvement of underrepresented groups in STEM and to strengthen our national STEM capabilities and competitive advantage. NSF expects BPRCs to demonstrate leadership in the involvement of groups traditionally underrepresented in STEM at all levels, including students, postdoctoral researchers and faculty.

Centers will offer the HBCU community a venue for interaction and an effective mechanism to undertake long-term integrated research and education activities focusing on broadening participation research. Centers will also develop approaches to ensure the transfer of knowledge of research and education advances. BPRC partner institutions work together with the lead institution as an integrated whole to achieve the shared research, education, outreach, and knowledge-transfer goals of the Center.

The National Academies Report [5] states that "HBCUs by their very mission, purpose and environment are more likely to achieve success" in recruiting, retaining, and graduating African American students in STEM fields and lists the reasons for this success. Therefore, Centers are expected to gather and represent the collective intelligence of HBCU STEM higher education, and serve as the national hub for the rigorous study and broad dissemination of the critical pedagogies and culturally sensitive interventions that contribute to the success of HBCUs in educating African American STEM undergraduates. Centers that meaningfully incorporate and promote broad and systemic connections to mainstream STEM higher education reform efforts are especially encouraged. These connections are critical, because according to the above cited report, [5] "only a small number of institutions (including HBCUs) serve the needs of underrepresented minority students".

6. OTHER FUNDING OPPORTUNITIES

HBCU-UP funds planning grants of twelve to eighteen months to undertake an institutional STEM program self-analysis in preparation for submitting an Implementation Project, a Broadening Participation Research Center Project, or a proposal that focuses on establishing a new department. Planning grants are also accepted from institutions that want to undertake an analysis in preparation for submitting a center grant or institutional transformation grant to other NSF divisions for studying institutional preparedness and setting up the needed collaborations among stakeholders. Planning grants are submitted as unsolicited proposals. PIs are advised to discuss the planning grant proposal with a program director before submission.

Institutions currently holding an Implementation Project or ACE Implementation Project award can apply for a one-time supplement for up to $100,000 to establish sustainable practices and mechanisms to prepare students to compete successfully for graduate research fellowships such as the NSF Graduate Research Fellowship or a one-time supplement for up to $150,000 to establish sustainable practices to assist faculty, particularly new faculty, in establishing a research program. Please note that institutions who are seeking an Implementation Project or ACE Implementation Project award are expected to include such activities in the proposal.

III. AWARD INFORMATION

HBCU-UP Proposals: (pending the availability of funds)

1) Targeted Infusion Projects

- Number of awards: Up to 22 in FY 2021 and up to 22 in FY 2022
- Project Length: From two to three years
- Award size: Up to $400,000
- Grant Administration: Targeted Infusion Projects will be managed by NSF as continuing or standard grants

2) Broadening Participation Research Projects

- Number of awards: Up to 6 in FY 2021 and up to 6 in FY 2022
- Project Length: Up to three years
- Award Size: Up to $350,000
- Restrictions: Equipment costs are not normally allowed under Broadening Participation Research Projects
- Grant Administration: Broadening Participation Research Projects will be managed by NSF as continuing or standard grants

3) Research Initiation Awards

- Number of awards: Up to 22 in FY 2021 and up to 22 in FY 2022
- Project Length: Up to three years
- Award Size: Up to $300,000
- Restrictions: Equipment cost may not exceed 20% of the total budget
- Grant Administration: Research Initiation Awards will be managed by NSF as standard grants or continuing grants

4A) Implementation Projects

- Number of awards: Up to 6 in FY 2021 and up to 6 in FY 2022
- Project Length: Up to 4 years for 1st round Implementation Project; up to five years for 2nd and 3rd round Implementation Projects
- Award Size: Up to $1.25 million for 1st round Implementation Projects; up to $2.25 million for 2nd and 3rd round Implementation Projects
- Restrictions: Equipment costs may not exceed 30% of the total budget request
- Grant Administration: Implementation Projects will be managed by NSF as continuing grants

4B) ACE Implementation Projects

- Number of awards: No more than 1 in FY 2021 and no more than 1 in FY 2022
- Project Length: Up to five years
- Award Size: Up to $3 million
- Restrictions: Equipment costs may not exceed 30% of the total budget request
- Grant Administration: ACE Implementation Projects will be managed by NSF as continuing grants

5) Broadening Participation Research Centers

- Number of awards: No more than one in FY 2022
- Project Length: Up to five years
- Award Size: Up to $9 million
- Grant Administration: Broadening Participation Research Centers will be managed by NSF as continuing grants

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- **HBCU-UP Proposals:** Historically Black Colleges and Universities (HBCUs) that are accredited and offer undergraduate educational degree programs in science, technology, engineering and mathematics (STEM).

Who May Serve as PI:

- The Principal Investigator for a **Targeted Infusion Project** must be the individual who will direct the implementation of the project activities.
- The Principal Investigator for a **Broadening Participation Research Project** must be responsible for managing the project and must be one of the key researchers. At least one of the Principal Investigators must have experience in education or

social science research.
- The Principal Investigator for a **Research Initiation Award** must be a faculty member in a STEM or STEM education discipline at the HBCU. Co-Principal Investigators and senior personnel are not permitted.
- The Principal Investigator and co-Principal Investigators for an **Implementation Project, ACE Implementation Project, or a Broadening Participation Research Center must** be the key personnel that will be responsible for guiding the implementation of the project or Center.

Limit on Number of Proposals per Organization:

HBCU-UP Proposals:

- An eligible institution can submit only one Implementation Project or ACE Implementation Project proposal per year. An institution may have only one active Implementation Project or ACE Implementation Project award. However, a new proposal can be submitted by an institution with an active project if that project is due to expire before new awards will be made. Also, an institution can be awarded, at most, three Implementation Projects and one ACE Implementation Project over time.
- An eligible institution can submit only one Broadening Participation Research Center proposal and can have only one active center. The lead institution of the center proposal must have been awarded three rounds of an Implementation or ACE Implementation Project and must demonstrate the capacity to conduct broadening participation research.
- An eligible institution can submit no more than two Broadening Participation Research proposals per year.
- An eligible institution can submit no more than two Targeted Infusion Project proposals per year and can only have one active Targeted Infusion Project for any given department or unit.
- An eligible institution can submit no more than two Research Initiation Award proposals per year.

Limit on Number of Proposals per PI or Co-PI: 2

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required)*:

Letters of intent are required for HBCU-UP submissions, except Broadening Participation Research Centers.

All letters of intent must be submitted via FastLane. A separate letter of intent is requested for each application for Targeted Infusion Project, Broadening Participation Research Project, Research Initiation Award or Implementation/ACE Implementation Project proposal that will be submitted from an eligible institution. Letters of Intent are not required for BPRC proposals.

Letters of intent must contain the following information:

- The type of proposal that will be submitted (Targeted Infusion Project, Broadening Participation Research Project, Research Initiation Award or Implementation/ACE Implementation Project).
- The project title.
- The PI name and Co-PI names, department, institution, phone, fax and email, and the PI listed as point of contact. It is important that the PI be listed as point of contact, not the sponsored research representative.
- The submitting institution's name.
- A project synopsis (no more than 500 words) that describes the proposed research and/or implementation activities.

Note:

- Research Initiation Award letters of intent should list only the PI under Senior Project Personnel.

Technical assistance will be offered by program directors to proposers once a letter of intent has been submitted.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Submission by an Authorized Organizational Representative (AOR) is required when submitting Letters of Intent.
- A Minimum of 1 and Maximum of 4 Other Senior Project Personnel are permitted
- Proposal Type is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is permitted

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

A preliminary proposal is required only for Broadening Participation Research Center proposals. Submission of a preliminary proposal is required to be eligible for invitation for a full BPRC proposal. Preliminary proposals that are not compliant with the guidelines may be returned without review, thus making the proposing team automatically ineligible for submitting a full BPRC proposal.

Preliminary BPRC proposals must contain the items listed below and adhere strictly to the specified page limitations. No additional information may be provided as an appendix or by links to web pages. Figures and tables must be included within the applicable page limit.

Preliminary BPRC proposals will contain an overview of the proposed vision, strategic plan, partnerships, research, education, outreach, and knowledge transfer activities with sufficient detail to allow assessment of the intellectual merit and broader impacts of the proposed Center.

Preliminary Proposal Contents

The preliminary proposal should consist of the following elements:

- Project Summary (1 page maximum): Provide an overview of the proposed Center, addressing separately the intellectual merit and broader impacts.
- Project Description (8 pages maximum): The Project Description should articulate a vision for the proposed Center that clearly outlines the challenges being addressed. The proposed research should be sufficiently complex and long-term to justify a Center and flexible enough to permit change as the research proceeds. In addition to an outline of research themes, some illustrative examples of specific research directions with sufficient detail to be evaluated by reviewers should be included. The Project Description must describe how the integration of research, education, outreach, and knowledge transfer in a Center-level activity will advance the proposed research in a way that other funding mechanisms cannot. A description of the team members and why each is essential to the project plan should be included (must not be more than 2 of the 8 pages). Results from Prior NSF Support should not be included.
- References Cited (2-page limit): See NSF PAPPG instructions for format.
- Biographical Sketches (2-page limit per person): Biographical Sketches are required for the PI and co-PIs only.
- Supplementary Documents (to be entered in the Supplementary Documents section of FastLane): a) List all project personnel who have a role in the management, research, education, outreach, and knowledge transfer components of the Center. Provide the last name, first name, and institution/organization. b) Include a one-page table indicating an estimate of funds that will be allocated to each participating institution broken down by category, i.e., research, education, outreach, and knowledge transfer.
- Collaborators & Other Affiliations (COA) information specified in the PAPPG should be submitted using the instructions and spreadsheet template found on the Collaborators and Other Affiliations Information website at https://www.nsf.gov/bfa/dias/policy/coa.jsp. Please note that proposers using the COA template for more than 10 senior project personnel will encounter proposal print preview issues. Please see the COA website for updated guidance.

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.

For HBCU-UP PROJECTS

COVER SHEET

Under "NSF Unit Consideration" please select:

- "HRD-Division of Human Resource Development" as the division
- "Hist Black Colleges and Univ" as the program

Adhere to the following instructions for the title:

- Targeted Infusion Project proposals:
  - Please begin the project title with "Targeted Infusion Project:"
- Broadening Participation Research Center proposals:
  - Please begin the project title with "Broadening Participation Research Center:"
- Broadening Participation Research proposals:
  - Please begin the project title with "Broadening Participation Research Project:"
- Research Initiation Award proposals:
  - Please begin the project title with "Research Initiation Award:"
- Implementation proposals:
  - Please begin the project title with "Implementation Project:"

- ACE Implementation proposals:
    - Please begin the project title with "ACE Implementation Project:"

Review the regulations regarding Human Subjects (45 CFR 690.101-124 https://www.nsf.gov/bfa/dias/policy/human.jsp). This is particularly important for Broadening Participation Research Projects and Broadening Participation Research Centers. Please note that Human Subjects regulations also govern activities that have to do with safeguarding individually identifiable information such as student and faculty surveys and data. Therefore, many Implementation Projects and possibly Targeted Infusion Projects may need to be reviewed by the Human Subjects Internal Review Board (IRB) for the institution. If the project will be IRB reviewed, please indicate on the cover sheet that the review is pending. If the proposal has already been IRB reviewed and found to be exempt, please indicate so on the cover sheet. If the IRB has already given approval of the activities include a letter from the IRB and indicate the expiration date of the IRB approval on the cover sheet. Please note that an award cannot be made unless the IRB process has been completed and documentation has been received by the program director prior to recommending the award.

REQUIRED COMPONENTS FOR ALL PROPOSALS

Follow all PAPPG guidelines as well as the additional guidelines given below for the required student mentoring plans, project evaluation and guidelines pertinent to each track.

STUDENT MENTORING PLAN(S)

HBCU-UP requires that proposals requesting funding to support students must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Mentoring plans for undergraduate students should be separate and different from mentoring plans for any graduate students that are involved in the project. Mentoring plans should not only speak to research mentoring for the students, but how the PIs will mentor and work with the students to achieve the next level in their scholastic or professional careers.

LETTERS OF COLLABORATION

All letters of collaboration should follow PAPPG guidelines, except as otherwise noted in the additional guidelines pertinent to each track below.

PROJECT EVALUATION

Evaluation of the HBCU-UP projects is a high priority for this program. All **Targeted Infusion Projects, Implementation and ACE Implementation Projects, and Broadening Participation Research Center** proposals, therefore, should include an evaluation section that describes how the project will be evaluated in determining the accomplishment of project goals and impact. The project evaluation should be designed to serve as a valuable source of information on how the project is being implemented, specifically, what works and what should be modified. The evaluation plan should be based on benchmarks, indicators, or expected outcomes related to project goals and activities. Evaluation plans should include a logic model or other tool that connects the project goals to the specific activities, and outputs, as well as the outcomes.

Evaluation plans should be appropriate to the size and scope of the project, and usually include both formative and summative components based on the evaluation questions of interest along with a proposed timeline. 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 expert independent evaluator or evaluation team, depending on the size and scope of the project. Evaluators are expected to adhere to the American Evaluation Association's Guiding Principles for Evaluators (http://www.eval.org/p/cm/ld/fid=51), 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: An Evaluation Guide for STEM Graduate School Leaders, available at: https://live-nsfagep.pantheonsite.io/wp-content/uploads/2011/04/MeasuringDiversity-EvalGuide.pdf
- Common Guidelines for Research & Development, available at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13126
- The 2010 User-Friendly Handbook for Project Evaluation, available at: https://www.informalscience.org/sites/default/files/TheUserFriendlyGuide.pdf
- Framework for Evaluating Impacts of Informal Science Education Projects, available at: https://www.informalscience.org/sites/default/files/Eval_Framework.pdf
- User-Friendly Handbook for Mixed Method Evaluations, available at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf97153
- Framework for Evaluating Impacts of Broadening Participation Projects, available at: https://www.nsf.gov/od/broadeningparticipation/framework-evaluating-impacts-broadening-participation-projects_1101.pdf
- AGEP Evaluation Tools, available at: http://www.nsfagep.org/evaluation-resources/.

Broadening Participation Research and Research Initiation Award projects should include a strategy for ongoing objective external feedback using benchmarks, indicators, logic models, roadmaps or other evaluative methods to document progress toward goals, objectives and outcomes defined in the proposal. All projects are expected to track and report their accomplishment of proposal targets for broader impacts and intellectual merit. This objective external feedback can be provided in different forms such as an advisory board, experts in the field, or through a formal evaluation, if appropriate. A plan for soliciting objective external feedback must be documented in the proposal.

ADDITIONAL GUIDELINES PERTINENT TO EACH TRACK

1) Targeted Infusion Projects

The project description should include the following information:

Background and Context

- Describe the overall goals and objectives of the project. The objectives must be clearly stated, measurable, and achievable within the proposed timeline.
- Describe the benefits of achieving the goal to STEM education and research at the institution.

- Include baseline data to provide the context for the impact of the Targeted Infusion Project.
- Provide information on the extent to which evidence-based instructional practices in the department(s) involved in the proposed project are used. Be specific as to what these practices are, in what departments and specific courses they are employed, and how many students are typically enrolled in these courses.

Proposed Activities

- Describe the specific activities that will be undertaken in order to achieve the goals and objectives
- Describe and make a strong case for how the project advances knowledge in STEM education through research, evaluation, or a combination of research and evaluation processes. The theoretical and empirical justification for the proposed project must be clearly articulated.
- Since institutions have different policies and procedures, such as for new degree program approval, explain how the project timeline reflects all institutional requirements. If appropriate, include evidence (such as letters of support) that indicate that institutionally required procedures are being followed and preliminary approvals have been secured.
- Equipment and supplies:
    - Explain how recurring costs, such as lab supplies for a newly created laboratory course or recurring software license/maintenance fees, will be supported after the project ends.
    - Quotes or estimates for major equipment purchases should be included in the supplementary documents section.
    - Explain how long-term maintenance of new equipment will be supported after the project ends.

Dissemination

- Describe plans to communicate the knowledge gained (including the results and outcomes of the project) to other professionals in STEM education and research, both during and after the project. Describe the information to be disseminated, the means of dissemination, and the procedures for determining the success of the dissemination effort.

Project Management

- Provide a management plan for the project that will ensure that the activities and the required reporting will be implemented on time and within budget.
- Provide a timeline for the activities to be implemented - include measurable objectives and outcomes, and the staff that are responsible for carrying out the activities.

Project Evaluation

- It is expected that each Targeted Infusion proposal will include a formative and summative evaluation plan. The evaluation plan should refer to the objectives, goals and baseline data presented within the description of the proposed Targeted Infusion Project activities. The formative evaluation should include benchmarks and indicators of progress to assess the Targeted Infusion Project. The summative evaluation should assess whether the Targeted Infusion Project achieved the overall goals, as well as identify any unexpected results. The evaluator should be someone external to the project.

A letter of collaboration indicating specific institutional support for the project activities from the appropriate administrator should be included.

2) Broadening Participation Research Projects

The project description should include the following information:

Background and Context

- Describe the research question(s) to be investigated and explain the significance and importance of answering the proposed research question(s). Discuss the base of research/theory that motivates the question(s).
- Explain how the project will contribute to the knowledge base of broadening participation research and how it has the potential to be replicated at other HBCUs, and other institutions seeking to increase the success of underrepresented students in STEM.

Proposed Research Activities

- Describe the research plan (design, data collection, data analysis, etc.) that will be undertaken to answer the research question(s).
- Address the validity and reliability of new or previously validated survey instruments.
- Provide a timeline for the research plan - include measurable objectives and outcomes and identify who will be responsible for completing each task.
- A study of a promising intervention and effectiveness studies are permitted.
- In general, implementation activities are not recommended under Broadening Participation Research Projects. In some cases, implementation activities may be appropriate, but these activities must clearly be required in order to answer the proposed research question(s) and must be significantly different from implementation activities undertaken in other projects. If implementation activities are included, clearly explain why the activities are needed to answer the research question(s).

Dissemination

- Describe detailed plans to communicate the results and outcomes of the project to other professionals in STEM education and research and the higher education community, both during and after the project. Describe the information to be disseminated, the means of dissemination, and the procedures for determining the success of the dissemination effort.

Project Management

- Provide a management plan for the project that will ensure that the activities and the required reporting will be implemented on time and within budget.
- At least one of the PIs on the project must have formal training or significant professional experience in education or social science research.

Project Evaluation

- It is expected that each Broadening Participation Research proposal will include an evaluation plan that includes benchmarks and quantitative

and qualitative indicators of progress for the research project. The plan should address the assessment of project outcomes and contributions to the research knowledge base and/or educational practice. The evaluator should be someone external to the project.

3) Research Initiation Awards In addition to following the general format for research proposals as described in the PAPPG, Research Initiation Award (RIA) proposals submitted must also adhere to the following special instructions:

It is the responsibility of the PI to find a research collaborator at the home institution; a NSF-funded research center, such as a Center for Research Excellence in Science and Technology, Engineering Research Center, Materials Research Science and Engineering Center, Physics Frontier Center, Science and Technology Center, or Science of Learning Center; at a national laboratory; or with a research group at a research university. The PI could conduct research during the summer months at the research collaborator's site (if it is not the home institution) and make arrangements for continuing the research during the academic year at his or her home institution. Support can be provided for release time during the academic year, summer salary for the PI, travel and housing at the research site for the PI and undergraduate students, and stipends for undergraduate student research experiences. Research Initiation Awards are for faculty who are starting to build a research program. Faculty members who hold or have held an external research award within the last three years are not eligible for the Research Initiation Award.

The Project Description should provide a detailed statement of the proposed research to be undertaken. It should contain the following:

- Provide a brief description of the PI's overall research and education goals.
- Provide a clear outline of the general plan of work, including the research questions or hypotheses, the broad design of activities to be undertaken, and, where appropriate, a clear description of experimental methods and procedures. Proposers should address what they 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. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Identify the relationship of the proposed activities to the PI's projected longer term research goals.
- Provide a discussion of how those activities will benefit the research capacity at the institution.
- Provide a discussion of how undergraduate students will be involved in this research.
- Supply a plan for dissemination of this research.
- Supply a plan for how the progress of the research will be assessed.

Special Information and Supplementary Documentation:

Include the following:

- A letter of commitment from the PI's Department Chair or Dean stating that the PI will have institutional support in terms of allowance for release time, travel for research purposes, and access to existing research facilities.
- A mentoring plan for the PI from the Department Chair, Dean, or a senior faculty member. Note: if the letter of commitment and the mentoring plan are written by the same person, one document can be submitted.
- A letter of collaboration from the PI's research collaborator.
- A mentoring plan from the PI for the undergraduate students that are involved in the project and the graduate students that may be involved in the project.

4A) Implementation Projects: Implementation Projects should be about creating or adapting, and implementing, studying, and assessing evidence-based practices that strengthen and enhance STEM teaching and learning, increasing productivity and outcomes from STEM undergraduate programs. The relevant research or knowledge base that supports the effectiveness of the efforts selected should be included with compelling arguments as to why these strategies are expected to result in the anticipated outcomes at the institution.

4B) ACE Implementation Projects: This highly competitive track is for accomplished HBCU-UP institutions that are exemplars because of their consistent academic achievement in the HBCU STEM community. The proposals for this track are ambitious, potentially transformative, and have the promise of significant advances in STEM undergraduate education at the HBCU. The goal of the ACE program is in helping these institutions to excel and moving the HBCU-UP portfolio forward.

For both 4A) and 4B), the project description should include the following elements:

Background and Context

- State the problem(s) to be addressed.
- Articulate current knowledge of the problem(s) and some of the causes as understood from documented sources.
- Provide information on the institution's current STEM education and research capability (baseline data). Examples of information and data include a description of STEM degree programs, student enrollment, retention, graduation rates, number of students going to graduate schools, gatekeeper course performance, STEM faculty demographics, and STEM infrastructure resources at the institution and collaborating organizations.
- Provide information on the extent and use of evidence-based instructional practices in STEM degree programs at the institution. Be specific as to what these practices are, in what departments and specific courses they are employed, and how many students are typically enrolled in these courses.
- Describe prior efforts and results of those efforts. Provide information on STEM-related programs that have been implemented or are currently active. This should include previous HBCU-UP awards and awards from other NSF programs, other federal programs, state programs, and institution programs. Explain the outcomes from these efforts. Institutions that have received an HBCU-UP Planning Grant must describe the planning grant activities and the findings of those activities.
- Identify the areas that have not been understood, determined, verified, tested, or resolved by previous efforts. Highlight some of the areas that need improvement and that will be addressed with the proposed project activities.

Goals and Objectives

- Clearly state the goals and objectives of the project.
- Describe the information and knowledge that will be obtained from the project.
- Describe the expected results and student outcomes.
- Explain the expected significance of the project and the compatibility with the mission and environment of the institution.

Detailed Project Plan

- Describe the research-based or evidence-based practices selected for implementation and why and how they could improve undergraduate STEM education at the institution and under the present setting and conditions.
- As necessary, describe the demographic, social, cultural, and economic environment in which the project is situated and how this environment may affect implementation, operations, and results. Describe adjustments that must be made to adapt the documented practices and strategies of this project to the environment.
- Implementation Design: Present the conceptual model of the project and describe each of the components (i.e. each of the educational activities and interventions being implemented) and their links to the project goals and objectives.
- Implementation/Intervention Study: Define the procedures and methods for analyzing and assessing each of the educational activities and interventions of the project in producing the desired effects.
- Define the expected measurable outcomes and explain the relationships with the components of the implementation linked to project goals and objectives. Include indicators and benchmarks with timelines that will determine which implementation strategies are proving to be effective in the environment.

Dissemination

- Describe plans to communicate the knowledge gained, results and outcomes of the project to other professionals in STEM education and research, both during and after the project. Describe the information to be disseminated, the means of dissemination, and the procedures for determining the success of the dissemination effort.

Project Management Plan

- Implementation of evidence-based practices and programs almost always requires organizational change. Define the organizational structure for the project and explain its institutional alignment for achieving the project goals and objectives. Define the roles and responsibilities of key personnel who will carry out project activities.
- Define the processes and systems that will be applied to operate the project, including budget management, data management and reporting.
- Define the plans for sustainability or institutionalization of any project components.
- The Principal Investigator should be an academic leader with the authority to lead a project that crosses several STEM schools, departments, or units. The co-Principal Investigators should be STEM academic leaders, scientists, and faculty members who carry-out the project work plan. Implementation Projects should have an Internal Steering or Advisory Committee to help manage the project implementation, resolve project issues, and ensure that the project is on track for meeting project goals. Implementation Projects also should have an external advisory committee that meets at least once a year.
- Define the commitment of institutional leadership to the implementation process. Provide evidence of the commitment to the proposed Implementation Project activities from the institution's administration, STEM leadership and faculty, and other partners and collaborators, as applicable. Substantive letters of commitment to the proposed project activities can be included as supplementary documents. General letters of support from individuals not involved in the implementation of project activities should not be included.

Evaluation plan

- Provide a formative evaluation plan with strategies to monitor operations and activities of the project as they evolve and to inform and guide these efforts.
- Describe the criteria to be used in evaluating the quality and impact of the project and the process for collecting and analyzing information at the institution.
- Provide a summative evaluation plan with strategies to assess the effectiveness and impact of the project in achieving its goals and for identifying positive and negative findings when the project is completed.
- Include the capability statement and credentials of the external evaluator as supplementary documents.

Research Project

Second round and subsequent Implementation and ACE Implementation Project proposals are required to include a five-page supplementary document that describes, in detail, the research project. The research is linked to the proposed approaches and interventions to formally study why and if such approaches work in the particular setting of the HBCU. Research that investigates novel aspects of the proposal is especially encouraged. It should be clear in the proposal, which team members, and/or consultants will undertake the research and their relevant qualifications should be included. The supplemental document must include information relevant to the proposed study, such as: The research question(s) to be investigated; the conceptual framework for the project; and a discussion of the theory or theories grounding the research and testable hypotheses. The research plan must include the research design, including underlying methodological assumptions, targeted population and sampling, measures and instruments, and data gathering and analysis plan. Data collection procedures should be specified, particularly with information on the reliability, validity, and appropriateness of proposed measures and instruments or specific plans for establishing them if not initially known. Quantitative research should include statistical methods to be used. Qualitative studies should include procedures to collect, code, reduce, and analyze data and specific conceptual frameworks that will guide analysis.

For the research project, Implementation or ACE Implementation Projects may offer a postdoctoral research fellowship to a social science or educational researcher to provide opportunities early in his or her career. The postdoctoral research fellowship is intended to provide beginning investigators with research experiences that will broaden perspectives, facilitate interdisciplinary interactions and establish them in positions of leadership within the scientific community, specifically in the area of broadening participation research.

A letter of collaboration indicating specific institutional support for the project activities from the appropriate administrator should be included.

5) Broadening Participation Research Centers: Institutions that have been awarded three previous Implementation or ACE Implementation Projects are eligible to be the lead institution to submit a proposal for a Broadening Participation Research Center (BPRC). BPRCs conduct world-class research through partnerships, as appropriate.

The project description for the full proposal must include the following elements as described below.

The Project Description must contain the sections described below and cannot exceed 25 pages including tables and illustrations. The broader impacts resulting from the proposed project must be addressed and described as an integral part of the narrative.

- Introduction and Rationale for the Center (suggested 4 page limit): Describe the background for the Center and its expected significance. Explain the unique opportunities that a Center will provide and describe what will be achieved in the center mode that could not be achieved otherwise. Describe how the Center will build a community of scholars in the science of broadening participation. Show how the Center will contribute to

incorporating and promoting the connection of HBCUs to mainstream STEM higher education reform. Discuss the goals and objectives of the Center. Include appropriate baseline data to provide the context for the impact of the Center. Describe the potential legacy of the Center.

- Description of the Research Objectives of the Center (up to 10 pages): State the overall vision and long-range research goals of the Center. Describe the proposed research areas/themes and how they integrate with each other to realize the Center's research vision. Indicate the lead role of each partner organization or participant in each research topic/goal area. The research focus should be sufficiently long-term to justify a center form of organization and flexible enough to permit change as the research proceeds. Provide a research plan with sufficient detail to allow assessment of the scientific merit and to justify the necessity for the center mode of operation. Indicate the potential impact or expected significance the Center's research will have.
- Description of the Education Objectives of the Center (suggested 2 page limit): Present an education plan that describes how the Center will integrate research and education. The education activities should be evidence-based practices developed in the context of current education research. Describe plans for the mentoring and professional development of junior faculty, post-doctoral fellows, and students involved in the Center's education activities. Describe plans for recruiting students and describe the proposed activities in sufficient detail.
- Description of the Outreach and Knowledge Transfer Objectives of the Center (suggested 1.5 page limit for each): Present a plan that describes how the Center will conduct outreach to the scientific and academic communities and the general public; will provide technical assistance to Historically Black Colleges and Universities and other institutions; and will communicate the results and outcomes of the Center to the scientific community in STEM education and research. Describe how the Center will be a hub for dissemination of research on broadening participation and will connect the research community in this field. Describe other ways of knowledge transfer unique to the Center's mission and goals.
- Description of the Management Plan for the various components of the Center (suggested 3 page limit): Develop and present a management plan for the Center. Identify key members of the Center Management Team and explain their specific roles and areas of responsibility. The Center Director must have the capacity to develop and lead a team to fulfill the vision of the Center. Key members of the Center Management Team must have management experience and qualifications to administer their component of the Center. It is expected that the lead institution partners with other HBCUs; additional partnering organizations are chosen to complement the lead institution. The responsibilities of the lead institutions and partner organizations must be clearly described. Describe the processes that will be used to prioritize Center activities; to select and integrate research projects with one another and with other Center activities; to allocate funds and equipment across Center activities and among partners; and to select a replacement for the Center Director if needed. Describe the plans for sustainability or institutionalization of the Center. An external advisory committee is required for all Centers.
- Description of the Evaluation Plan (suggested 3 page limit): Provide a formative evaluation plan with strategies to monitor operations and activities of the Center as they evolve and to inform and guide these efforts. Describe the criteria to be used in evaluating the quality and impact of the Center's activities and the process for collecting and analyzing information. Provide a summative evaluation plan with strategies to assess the effectiveness and impact of the Center in achieving its goals. Include the capability statement and credentials of the evaluator(s) as supplementary documents.

Budget and Budget Justification. Provide a budget for each of the five years. The budget and budget justification should reflect start-up activities at the commencement of the Center activities. Submit a separate budget and budget justification for each participating institution.

Additional Special Information and Required Supplementary Documents:

The list of Partner Institutions and Project Personnel that were required in the preliminary proposal must be updated to reflect any changes occurring since the time of preliminary proposal submission. You can also use up to 2 pages to briefly describe the partnering institutions.

A timeline for all activities (limit 2 pages).

A letter of collaboration indicating specific institutional support for the project activities from the president of the lead institution should be included.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

- Required Meeting Travel: All proposals should budget for the PI to attend a two day grantee meeting in the Washington, DC area every year of the project.
- PIs who include a postdoctoral fellow for second, third or fourth round Implementation Projects or for ACE Implementation Projects may add the salary and fringe benefits, as well as an annual travel allowance of $2,000, for the postdoctoral fellow to the maximum allowed award size.
- Equipment Limitations:
    - Broadening Participation Research Projects and Centers - Broadening Participation Research Projects and Centers are not intended to support activities that would require research equipment; therefore major equipment is not normally included. However, minimal equipment costs are allowed if required to perform the research activities.
    - Research Initiation Awards - Equipment cost cannot exceed 20% of the total budget.
    - Targeted Infusion Projects, Implementation Projects and ACE Implementation Projects - Equipment costs cannot exceed 30% of the total NSF budget requested.

C. Due Dates

Letter of Intent Due Date(s) ***(required)*** (due by 5 p.m. submitter's local time):

July 28, 2020

Fourth Tuesday in July, Annually Thereafter

Research Initiation Awards

September 08, 2020

Second Tuesday in September, Annually Thereafter

Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects

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

March 22, 2022

Broadening Participation Research Centers

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

October 06, 2020

First Tuesday in October, Annually Thereafter

Research Initiation Awards

November 12, 2020

Second Thursday in November, Annually Thereafter

Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects

November 22, 2022

Broadening Participation Research Centers

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 underrepresented minorities 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

For HBCU-UP: In addition to the two NSF criteria for Intellectual Merit and Broader Impacts, special review criteria for **Targeted Infusion Projects, Implementation and ACE Implementation projects**are:

- Does the proposal describe a convincing rationale and appropriate methods for the project activities that are research-based/evidence-based?
- Are the project design and methods linked to measurable outcomes and are they appropriate to the scope, scale, and setting for the project?
- Is the project likely to produce high quality results that contribute to the undergraduate STEM education knowledge base?
- Is the project likely to have an impact on STEM education, student learning, and faculty practice?
- Is the project management plan adequate and does it include clear roles and responsibilities of the personnel who will contribute to the project?
- Is there commitment of the leadership to the implementation process?
- Does the evaluation plan define indicators and benchmarks to inform the project team and others about the operations and effectiveness of the implementation?
- Does the project have a plan for effective and scholarly dissemination of results?

Additional review criteria for **Broadening Participation Research Centers** are:

- Does the proposal convey a vision for how the Center will establish a culture in broadening participation research that will produce work that adds to the research knowledge base?
- How are the research, education, outreach, and knowledge transfer efforts strategically embedded and integrated in the proposed Center?
- To what extent are the research, educational, outreach, and knowledge transfer activities innovative and how do they contribute to the unifying mission of the proposed Center?
- To what extent does the proposed Center management have the vision, experience, and capacity to manage a complex and innovative enterprise that integrates research, education, outreach, and knowledge transfer?
- Does the evaluation plan define indicators and benchmarks to inform the project team and others about the operations and effectiveness of the implementation?

B. Review and Selection Process

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

HBCU-UP proposals are evaluated by ad hoc reviews, panel reviews or both. For Broadening Participation Research Centers, site visits are used in addition to ad hoc and panel reviews. Separate review panels are assembled for Implementation Projects (including ACE), Broadening Participation Research Projects, Research Initiation Awards, and Targeted Infusion Projects and Broadening Participation Research Centers. Unsolicited proposals typically receive ad hoc reviews. Research Initiation Awards and Broadening Participation Research Centers receive a combination of ad hoc and panel reviews. For highly rated Broadening Participation Research Centers, site visits will be conducted before an award recommendation is made.

Proposals for a Broadening Participation Research Center will be evaluated in a multi-phase merit review process. Preliminary proposals are required and will be evaluated by ad hoc review and a panel of experts in broadening participation research and education. Proposing institutions whose preliminary proposals are judged most promising by the panel and program directors will be invited to submit full proposals that will be evaluated by both ad hoc and panel review. Only those full proposals that were invited will be accepted. The full proposal review panel will identify those full proposals deemed worthy of site visit reviews; the other proposals will be declined. For proposals selected for a site visit, the site visit review will consider the review criteria, the vision and potential legacy of the proposed center, and institutional commitment to the proposed center. Following the site visits, NSF staff will analyze reviews and discussion summaries. The final decision concerning recommendations is based upon the proposal, the reviews and discussion summaries, and the site visit report. After the site visits, some centers selected for site visits may not be recommended for a center grant, but rather for a collaborative project award.

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:

Reverse Site Visits: Participation in a Reverse Site Visit (RSV) can be requested by NSF at any time during the grant period. The RSV is a presentation on the outcomes and progress of the grant activities at NSF in front of a peer review panel. Participation in the RSV is required by the appropriate grant management team and institutional administration.

Site Visits: NSF staff may visit the site of the grant project at anytime during the grant period. Reasonable accommodation of the site visit by NSF program staff is required by the grantee. NSF staff and/or a visiting committee will conduct site visits at Broadening Participation Research Centers annually.

Implementation Project, ACE Implementation Project, Targeted Infusion Project, Broadening Participation Research, and Broadening Participation Research Center awardees are required to submit the annual evaluation of the project.

Cooperation with NSF evaluation projects: NSF, an NSF contractor, or a grantee on behalf of NSF, may conduct program evaluations of HBCU-UP projects. These may occur at anytime during the grant period and sometimes after the grant period has ended. Reasonable cooperation with these efforts is required by the grantee.

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:

- Claudia M. Rankins, Program Director, telephone: (703) 292-8109, email: crankins@nsf.gov
- Michelle O. Claville, Program Director, telephone: (703) 292-7751, email: mclavill@nsf.gov
- Earnestine Easter, Program Director, EHR/DGE, telephone: (703) 292-8112, email: epsalmon@nsf.gov
- Emanuel Waddell, Program Director, telephone: (703) 292-4644, email: ewaddell@nsf.gov
- Toni Edquist, Program Specialist, EHR/HRD, telephone: (703) 292-4649, email: tedquist@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.

The National Science Foundation and the Institute of Education Sciences in the U.S. Department of Education developed *Common Guidelines for Education Research and Development*. The *Guidelines* describe six types of research studies that can generate evidence about how to increase student learning. Research types include those that generate the most fundamental understandings related to education and learning; examinations of associations between variables; iterative design and testing of strategies or interventions; and assessments of the impact of a fully-developed intervention on an education outcome. For each research type, there is a description of the purpose and the expected empirical and/or theoretical justifications, types of project outcomes, and quality of evidence.

The *Guidelines* publication can be found on the NSF website with the number NSF 13-126 (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13126). A set of FAQs regarding the *Guidelines* are available with the number NSF 13-127(https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13127). Grant proposal writers and PIs are encouraged to familiarize themselves with both documents and use the information therein in the preparation of proposals to NSF.

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** (NSF Information Center)**:** (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**

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

  or telephone: (703) 292-7827
- **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
Office of the General Counsel
National Science Foundation
Alexandria, VA 22314