

# Improving Undergraduate STEM Education: Hispanic-Serving Institutions (HSI Program)

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## PROGRAM SOLICITATION

NSF 18-524



National Science Foundation

Directorate for Education & Human Resources  
Division of Human Resource Development  
Division of Undergraduate Education

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

March 06, 2018

## IMPORTANT INFORMATION AND REVISION NOTES

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**Webinar.** The HSI Program team will host a webinar after the release of this solicitation. In the webinar, key features and expectations of the HSI Program will be discussed. Information regarding the webinar will be posted to the HSI Program webpage: <https://nsf.gov/ehr/HSIProgramPlan.jsp>.

The HSI Certification Form signed by the institutional representative must be included as a supplementary document with the proposal.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 18-1), which is effective for proposals submitted, or due, on or after January 29, 2018.

## SUMMARY OF PROGRAM REQUIREMENTS

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### General Information

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**Program Title:**

Improving Undergraduate STEM Education: Hispanic-Serving Institutions (HSI Program)

**Synopsis of Program:**

To enhance the quality of undergraduate STEM education at Hispanic-serving institutions (HSIs), the National Science Foundation (NSF) established the Improving Undergraduate STEM Education: Hispanic-Serving Institutions (HSI Program), in response to the Consolidated Appropriations Act, 2017 (P.L. 115-31) and the American Innovation and Competitiveness Act (P.L. 114-329). The HSI Program seeks to increase the retention and graduation rates of students pursuing associate or baccalaureate degrees in science, technology, engineering, and mathematics (STEM).

In designing the HSI Program, NSF has sought community input in a variety of ways that included releasing a Dear Colleague Letter ([https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf17092](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf17092)), awarding conference grants to seek stakeholder input, establishing and holding a meeting of the Building Capacity at Hispanic-Serving Institutions Subcommittee (HSI Subcommittee) of the Education and Human Resources (EHR) Advisory Committee, and conducting three virtual listening sessions that invited commentary from members of the HSI community (<https://nsf.gov/ehr/HSIProgramPlan.jsp>). To focus the comments from the three virtual meetings, five priority areas earlier identified in a listening session conducted in 2009 by the Quality Education for Minorities (QEM) Network were used: (1) Student support; (2) Faculty support; (3) STEM curricula enhancement and alignment; (4) Integration of research and education; and (5) Partnerships. Based on the feedback from these listening sessions and from the HSI Subcommittee report (<https://www.nsf.gov/ehr/Materials/HSISubcommitteeReport.pdf>), NSF developed a program solicitation to guide the initial focus of the HSI Program. NSF will continue to gather community input from funded HSI conferences to inform future components of, or modifications to, the HSI Program.

The HSI Program seeks to enhance the quality of undergraduate STEM education at HSIs and to increase retention and graduation rates of undergraduate students pursuing degrees in STEM fields at HSIs. In addition, the HSI Program seeks to build capacity at HSIs that typically do not receive high levels of NSF grant funding.

The HSI Program is aligned with NSF's commitment to increase access for underrepresented groups to the Nation's STEM enterprise.

For the purpose of the HSI Program, an eligible institution is the institution serving as the fiscal agent that must, at the time of application, be accredited, offer undergraduate educational programs in STEM, and satisfy the HSI definition as specified in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a), i.e., a) be an eligible institution; and b) have an enrollment of undergraduate full-time equivalent students that is at least 25 percent Hispanic students. Institutions should review the legislation before certifying their eligibility to this program [[http://legcounsel.house.gov/Comps/HEA65\\_CMD.pdf](http://legcounsel.house.gov/Comps/HEA65_CMD.pdf)].

The HSI Program supports standard and continuing grants that will:

- Develop, implement, and test models for the retention of students advancing from lower-division courses to upper-division STEM coursework, including those transferring from a two-year to a four-year institution.
- Create evidence-based and evidence-generating approaches that increase the graduation rates of students pursuing STEM associate or baccalaureate degrees at HSIs.
- Enhance research that improves understanding of how to build faculty capacity and student opportunities to conduct STEM research or STEM educational research at HSIs through partnerships with other HSIs and organizations (e.g., federal laboratories, research centers, industrial or business organizations, non-profit entities, etc.).
- Increase knowledge about evidence-based approaches to engaged student learning and how to broaden the participation of undergraduate students majoring in STEM disciplines at HSIs.

Towards these ends, the HSI Program will accept proposals in two tracks: (1) Building Capacity and (2) HSIs New to NSF. The Building Capacity track funds projects from \$500K to \$1.5M for up to 5 years and is open to all eligible institutions and has three priority areas: Critical Transitions; Innovative Cross-Sector Partnerships; and Research on Broadening Participation in STEM. The HSIs New to NSF track funds projects up to \$250K for up to 3 years and is open only to eligible institutions that have never received NSF funding, or that have not received NSF funding in the five years preceding the proposal deadline.

The HSI Program will also fund one Resource Hub project up to \$3M for up to five years. The Resource Hub will support the needs of HSIs with little or no prior NSF funding, such as assistance with proposal writing and financial compliance. In addition, the Resource Hub will facilitate networking and professional development that build and strengthen collaborations among HSIs.

#### **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.*

- For general inquiries, contact: [NSF-EHR-HSI@nsf.gov](mailto:NSF-EHR-HSI@nsf.gov)
- Andrea Johnson, Program Director, telephone: (703) 292-5164, email: [andjohns@nsf.gov](mailto:andjohns@nsf.gov)
- Talitha M. Washington, Program Director, telephone: (703) 292-8670, email: [twashing@nsf.gov](mailto:twashing@nsf.gov)
- Joan M. Walker, Program Director, telephone: (703) 292-7016, email: [jowalker@nsf.gov](mailto:jowalker@nsf.gov)
- Ellen Carpenter, Program Director, telephone: (703) 292-5104, email: [elcarpen@nsf.gov](mailto:elcarpen@nsf.gov)
- Toni Edquist, Program Specialist, telephone: (703) 292-4649, email: [tedquist@nsf.gov](mailto:tedquist@nsf.gov)

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

- 47.076 --- Education and Human Resources

## **Award Information**

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**Anticipated Type of Award:** Standard Grant or Continuing Grant

**Estimated Number of Awards:** 43

The 43 awards are expected to be made as follows in FY 2018: up to 25 Building Capacity (Track 1), up to 18 HSIs New to NSF (Track 2), and one Resource Hub.

**Anticipated Funding Amount:** \$30,000,000

Approximately \$30 million is anticipated, pending availability of funds for new awards in the FY2018 budget.

## **Eligibility Information**

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#### **Who May Submit Proposals:**

Proposals may only be submitted by the following:

- Eligible organizations for the HSI Program must be accredited and offer undergraduate educational programs in STEM, and satisfy the HSI definition as specified in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a), i.e., a) be an eligible institution; and b) have an enrollment of undergraduate full-time equivalent students that is at least 25 percent Hispanic students.

Certification of eligibility is required with submission of a proposal to the HSI Program. (See section V of the solicitation.)

#### Who May Serve as PI:

- The Lead Principal investigator (PI) for a Track 1 proposal must be employed by the eligible institution submitting the proposal.
- The Lead PI for a Track 2 proposal must be employed by the eligible institution submitting the proposal and the institution must be either be an institution that has never received NSF funding or an institution that has not received NSF funding in the five years prior to the proposal deadline.
- The Lead PI for a Resource Hub proposal must be employed by the eligible institution submitting the proposal. The Lead PI and co-Principal Investigators (co-PIs) must include at least one member from a two-year eligible institution and at least one member from a four-year eligible institution.
- Co-PIs for any proposal are not restricted to employees of eligible institutions except for the requirement for Resource Hub proposals discussed above.

#### Limit on Number of Proposals per Organization:

- An eligible institution can submit only one Track 1 or Track 2 proposal per year. However, eligible institutions submitting a proposal to Track 1 or Track 2 may also submit a Resource Hub proposal.
- An eligible institution can submit only one Resource Hub proposal.

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

- An individual may serve as the Lead PI on only one Track 1 or Track 2 proposal.
- An individual may serve as the Lead PI on only one Resource Hub proposal.
- There is no limit on the number of proposals that a co-PI may be listed on for Track 1, Track 2, or a Resource Hub. The Lead PI must be employed by an eligible institution but co-PIs are not restricted to employees of eligible institutions.

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
  - Full Proposals submitted via FastLane: *NSF Proposal and Award Policies and Procedures Guide (PAPPG)* guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=pappg](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](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)).

### B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:**

Not Applicable
- **Other Budgetary Limitations:**

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

### C. Due Dates

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

March 06, 2018

## Proposal Review Information Criteria

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### Merit Review Criteria:

National Science Board approved criteria apply.

## Award Administration Information

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**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**

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The National Science Foundation (NSF) established the Improving Undergraduate STEM Education: Hispanic-Serving Institutions (HSI Program), in response to the Consolidated Appropriations Act, 2017 (P.L. 115-31) and the American Innovation and Competitiveness Act (P.L. 114-329). The HSI Program seeks to enhance the quality of undergraduate STEM education at Hispanic-serving institutions (HSIs) [see Reference 1] and to increase retention and graduation rates of undergraduate students pursuing degrees in STEM fields at HSIs. In addition, the HSI Program seeks to build capacity at HSIs that typically do not receive high-levels of NSF grant funding.

By improving the quality of the undergraduate experience, the HSI Program expects to produce a more qualified and diverse STEM workforce.

In designing the HSI Program, NSF has sought community input in a variety of ways that included releasing a Dear Colleague Letter ([https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf17092](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf17092)), awarding conference grants to seek stakeholder input, establishing and holding a meeting of the Building Capacity at Hispanic-Serving Institutions Subcommittee (HSI Subcommittee) of the Education and Human Resources (EHR) Advisory Committee, and conducting three virtual listening sessions that invited commentary from members of the HSI community (<https://nsf.gov/ehr/HSIProgramPlan.jsp>). To focus the comments from the three virtual meetings, five priority areas identified in listening session that the Quality Education for Minorities (QEM) Network conducted in 2009 were used: (1) Student support; (2) Faculty support; (3) STEM curricula enhancement and alignment; (4) Integration of research and education; and (5) Partnerships. Based on the feedback from these listening sessions and from the HSI Subcommittee report (<https://www.nsf.gov/ehr/Materials/HSISubcommitteeReport.pdf>), NSF developed a program solicitation to guide the initial focus of the HSI Program. NSF will continue to gather community input from funded HSI conferences to inform future components of, or modifications to, the HSI Program.

The Improving Undergraduate STEM Education (IUSE) program is a foundation-wide effort to accelerate improvements in the quality and effectiveness of the education of undergraduates in all STEM fields. The importance of the undergraduate experience for preparing both a diverse STEM workforce and a STEM-literate public ready to support and benefit from the progress of science is well established [see References 2 – 9]. The IUSE initiative underpins the agency's commitment to the highest caliber undergraduate STEM education through a Foundation-wide framework of investments. By improving the quality and effectiveness of the education of undergraduates in all STEM fields, these investments enable NSF to lead progress nationally toward a diverse and innovative workforce and a STEM-literate public. Through the IUSE framework, NSF coordinates its investments in undergraduate programs and undergraduate STEM

education to enhance coherence and impact, and to use shared metrics and program evaluation approaches where appropriate. These investments are made across all directorates and address both general trends and specific disciplinary needs. Examples of general trends include the use of active learning approaches in undergraduate instruction, the increase of undergraduate research courses, and attention to undergraduate degree completion. IUUSE also seeks to broaden participation in STEM fields from all sectors and groups in society, and proposers are especially encouraged to establish linkages, as appropriate, with components of the national network of NSF INCLUDES projects (see [https://www.nsf.gov/news/special\\_reports/nsfincludes/index.jsp](https://www.nsf.gov/news/special_reports/nsfincludes/index.jsp)). Collaborations are encouraged between HSI Program proposals and existing NSF INCLUDES projects, provided the collaboration strengthens both projects.

#### References

[1] The Higher Education Act of 1965 (P.L. 89-329) [As Amended Through Public Law 113–67, Enacted December 26, 2013]; [http://legcounsel.house.gov/Comps/HEA65\\_CMD.pdf](http://legcounsel.house.gov/Comps/HEA65_CMD.pdf)

[2] Planning Committee for the National Summit on Developing a STEM Workforce Strategy, Board on Higher Education and Workforce, Policy and Global Affairs, National Academies of Sciences, Engineering, and Medicine, Joe Alper (Rapporteur) Developing a National STEM Workforce Strategy: A Workshop Summary, National Academies Press, 2016.

[3] Committee on Barriers and Opportunities in Completing two-year and four-year STEM Degrees, Board on Science Education, Policy and Global Affairs, National Academy of Engineering, National Academies of Sciences, Engineering, and Medicine, Shirley Malcom and Michael Feder (Editors), Barriers and Opportunities for two-year and four-year STEM Degrees, National Academies Press, 2016.

[4] National Research Council, Discipline-based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering. Washington, DC: National Academies Press, 2012. [https://www.nap.edu/catalog.php?record\\_id=13362](https://www.nap.edu/catalog.php?record_id=13362)

[5] NSF INCLUDES Initiative, [https://www.nsf.gov/news/special\\_reports/nsfincludes/index.jsp](https://www.nsf.gov/news/special_reports/nsfincludes/index.jsp)

[6] Kober, N., Reaching Students: What Research Says About Effective Instruction in Undergraduate Science and Engineering. Board on Science Education, Division of Behavioral and Social Sciences and Education, Washington, D.C.: The National Academies Press, 2015. [http://www.nap.edu/catalog.php?record\\_id=18687](http://www.nap.edu/catalog.php?record_id=18687)

[7] The Coalition for Reform of Undergraduate STEM Education, Catherine L. Fry (Editor), Achieving Systematic Change: A Source Book for Advancing and Funding Undergraduate STEM Education. Washington, D. C.: The Association of American Colleges and Universities, 2014. <http://www.aacu.org/pkal/sourcebook>

[8] Committee on Science Literacy and Public Perception of Science; Board on Science Education; Division of Behavioral and Social Sciences and Education; National Academies of Sciences, Engineering, and Medicine, Catherine E. Snow and Kenne A. Dibner (Editors), Science Literacy: Concepts, Contexts, and Consequences, Washington DC: The National Academies Press, 2016

[9] Booth, W.C, Colomb, G. C., and Williams, J. M. The Craft of Research, Chapter 4, Section 4.1.1, The University of Chicago Press, 2008.

## II. PROGRAM DESCRIPTION

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### A. OVERVIEW

Projects supported by the HSI Program are expected to generate new knowledge about how to enhance undergraduate STEM education that results in an increase in retention and graduation rates of undergraduate students pursuing degrees in STEM fields at HSIs. The HSI Program is particularly interested in developing new knowledge about successful advancement of undergraduates at HSIs through critical transitions, including the transition from lower-division to upper-division coursework. The HSI Program also encourages projects that develop mutually beneficial partnerships that build faculty capacity and student opportunities to conduct research or STEM education research at HSIs. These partnerships can be between academic institutions and/or between academic institutions and national laboratories, industry, or non-profit organizations. In addition, the HSI Program seeks to build capacity at HSIs that typically do not receive high levels of NSF grant funding.

The HSI Program will fund one Resource Hub. The Resource Hub is expected to support the needs of HSIs with little or no prior NSF funding, such as assistance with proposal writing and financial compliance. In addition, the Resource Hub will facilitate networking and professional development that build and strengthen collaborations among HSIs.

As a key component of NSF's overall Improving Undergraduate STEM Education (IUUSE) initiative, the HSI Program will support activities that improve STEM learning and learning environments, broaden participation and institutional capacity for STEM learning, and/or build the professional STEM workforce of tomorrow. Investments may include foundational and exploratory research, design and development research, and impact research.

The HSI Program supports standard and continuing grants that will:

- Develop, implement, and test models for the retention of students advancing from lower-division courses to upper-division STEM coursework, including those transferring from a two-year to a four-year institution.
- Create evidence-based and evidence-generating approaches that increase the graduation rates of students pursuing STEM associate or baccalaureate degrees at HSIs.
- Enhance research that improves understanding of how to build faculty capacity and student opportunities to conduct STEM research or STEM educational research at HSIs through partnerships with other HSIs and organizations (e.g., federal laboratories, research centers, industrial or business organizations, non-profit entities, etc.).
- Increase knowledge about evidence-based approaches to engaged student learning and how to broaden the participation of undergraduate students majoring in STEM disciplines at HSIs.

## B. PROGRAM TRACKS

Proposals should include the question(s) to be investigated, explain the significance of answering the proposed question(s), and discuss the evidence or theory that motivates the question(s). Proposals may combine research with practice, but should be based on current literature and proven practices. Each proposal should have clear project goals, measurable objectives, and evaluative activities aligned to the goals and objectives. It is expected that proposals should explain how the project will generate knowledge to better understand issues in the recruitment, retention, degree attainment, and entry into the STEM workforce of undergraduate students. As appropriate, HSI Program proposals should also describe mechanisms to effectively and efficiently transfer findings into educational practice for use by other educators, researchers, and policymakers. Sustainability beyond the funding period should be addressed. Through these projects, PIs are encouraged to identify areas that may have potential for forming collaborative efforts with existing NSF INCLUDES projects.

### 1. Track 1: Building Capacity

There are three priority areas within this track: Critical Transitions, Innovative Cross-Sector Partnerships, and Research on Broadening Participation in STEM. Proposals should focus on one or more of the priority areas as appropriate to their institutions' goals, capabilities and resources.

#### Priority Area 1: Critical Transitions

Critical transitions on the way to degree attainment include i) the transition from lower- to upper-division coursework at individual HSIs and ii) the transfer of students from two-year institutions to four-year institutions. Priority Area 1 supports projects that address the retention of undergraduate students in the first two years of undergraduate studies, which are critical to student retention in STEM majors.

Many students struggle to pass introductory courses or "gateway" classes, and many require remediation or supplemental instructions. It is important to understand the factors that affect student learning, and proposals that plan to explore these factors should explain the use of a particular strategy, the theory or basis for such strategy, and the potential outcomes.

Proposals that address the transition of students from two-year to four-year institutions should include institutional partnerships among two-year institutions and four-year institutions. These institutional partnerships should have in place or plan to develop articulation agreements for the transfer of students from one institution to another that lead to STEM baccalaureate degree attainment. These multi-institutional partnerships and agreements should fit the needs and situations of the institutions involved. The proposed projects should identify and investigate factors, such as self-efficacy or identity, that affect transfer student success and subsequent graduation. In addition, a mechanism should be described to track student outcomes, including outcomes following the students' completion of their programs. Projects are encouraged to establish processes that support/manage project activities across the partner institutions. Existing activities between collaborating institutions should not be included as proposed activities to be supported by the project.

For all Critical Transitions proposals, successful leadership/management teams will typically include current faculty members who teach undergraduate STEM courses, STEM administrators, and researchers who specialize in higher education issues and processes. The leadership/management teams should have representation from all institutional partners with explicit roles and responsibilities.

Projects that address this transition could have both research and applied or developmental components, and may be carried out by individual PIs or institutions, as long as they have the necessary expertise to carry out the proposed projects. These projects could also be done as collaborative projects that may involve several PIs and institutions, but such collaboration should be justified and be commensurate to the problem being addressed and resources available.

Examples of potential project strategies to address the Critical Transitions priority area include but are not limited to:

- Development of new curricular materials and methods of instruction that have the potential to improve student learning in STEM.
- Alignment of STEM curriculum between two-year and four-year institutions, to support student transitions.
- Development of innovative assessment tools to measure student learning.
- Opportunities for faculty to gain experiences with innovative, culturally relevant, and evidence-based teaching approaches.
- Academic support and activities that help students complete their degree programs.

#### Priority Area 2: Innovative Cross-Sector Partnerships

Today's research problems are complex and their solutions often require interdisciplinary teams and cross-sector partnerships. This priority area supports mutually beneficial partnerships that yield research projects with long-term benefits to society, enhance the capacity for research at partner institutions, and facilitate knowledge transfer between researchers and practitioners. Partners may include industry, government, academic institutions, non-profit organizations, and local communities. Projects should support innovative research and education projects that contribute to the Nation's future through discovery, learning, and innovation. Partnerships of academic institutions with organizations such as national laboratories, industrial organizations, and/or other public/private organizations should create new and meaningful knowledge and long-term benefit to society. Partnerships should generate new knowledge of effective ways to engage and retain undergraduate students in STEM, enhance skills and knowledge content of HSI faculty, and foster communication to encourage the formation and dissemination of new ideas, values, and learning.

The role of each partner should be explicitly described in the proposal. The involvement of two-year colleges or HSIs that have received little or no funding from NSF for research is strongly encouraged. Projects may involve any field of research supported by NSF, as well as formal and informal education. NSF encourages the participation of as many entities as needed to build effective relationships necessary for developing and sustaining a team that is capable of conducting research in STEM and/or STEM education research.

Examples of potential project strategies to address the Innovative Cross-Sector Partnerships priority area include, but are not limited to:

- Improving grants management infrastructure at HSIs.
- Developing mentoring partnerships that enhance the research capabilities at HSIs.
- Enhancing the quality of the undergraduate STEM experience in a culturally relevant manner, including support for student research experiences, especially among members of underrepresented groups.
- Strengthening faculty capabilities to conduct research.

- Fostering faculty exchange opportunities that enhance research collaborations, curriculum redesign and alignment, and/or new pedagogies.

### Priority Area 3: Research on Broadening Participation in STEM

The HSI Program will support projects that investigate factors affecting the recruitment, retention, and graduation rates of undergraduate STEM students at HSIs. Investigators may consider behavioral, cognitive, affective, learning, and social differences as well as organizational, institutional, or systemic processes that may affect the participation and success of students at HSIs. Successful proposals should be grounded in appropriate theory and incorporate recent advances in research methodologies, conceptual frameworks, and/or data gathering and analytics. Proposals should include descriptions of research and evaluation methodologies, as well as a compelling argument about how proposed methodologies align with the research questions of the project. Additionally, proposals should demonstrate how the chosen methodologies will result in rigorous, cumulative, reproducible, and usable findings that will support peer-reviewed publication. It is expected that projects in this priority area include investigators with demonstrated expertise in education research and/or social science research methods, as well as knowledge about STEM programs at HSIs.

Investigators who include this priority area in their proposals should propose institutional, academic, and programmatic activities to improve the retention of STEM students at HSIs, leading to increases in associate and/or baccalaureate degree attainment in STEM. Proposals should include evidence to support the potential of the proposed activities to achieve the desired goals. Institutions may request funds to support the adaptation and implementation of existing evidence-based academic and student support activities; to investigate the effectiveness of evidence-based academic and student support activities in recruiting, retaining, and graduating students in STEM; and for the management and evaluation of the project. Participating institutions should place attention to ensuring the competitiveness of STEM graduates for the next stage of their careers.

Examples of potential project strategies to address Research on Broadening Participation in STEM priority area include but are not limited to the following examples:

- Examining the institutional relevance of curricular redesign and/or alignment efforts.
- Evaluating the efficacy of near-peer student mentoring.
- Implementing evidence-based active learning strategies and interventions.
- Examining interventions aimed at improving enrollment in undergraduate STEM programs or increasing persistence and graduation rates.
- Partnering with experts and practitioners, particularly those with social science background, to develop evidence-based methods to broaden participation of undergraduate students majoring in STEM at HSIs.

### 2. Track 2: HSIs New to NSF

This track seeks to improve the research and development capacity of HSIs that are either an institution that has never received NSF funding or an institution that has not received funding from NSF in the five years prior to the proposal deadline. This grant opportunity is designed to stimulate implementation, adaptation, and innovation in one or more of the three priority areas identified in Track 1, and to broaden the number of HSIs participating in NSF programs. Prospective investigators are encouraged to provide sufficient detail to clearly inform both reviewers and NSF staff about what is being proposed. It is expected that some of the funded Track 2 projects will serve as a pilot for an idea that may be expanded in a future proposal for an NSF project.

Proposers are strongly encouraged to use resources developed by other NSF awardees and to consult with people from these projects and centers. Track 2 proposals should be commensurate with available resources. If some resources needed to complete the proposed activities are not available at the proposing institution, the needed resources may be obtained via partnerships with other institutions. Such partnerships will support development and capacity of the proposing institution. In such partnerships, the Lead Principal Investigators must be employed by an eligible Track 2 institution. The HSI Program is particularly interested in Track 2 projects that address retention and graduation rates of students pursuing associate or baccalaureate degrees in STEM.

Only eligible institutions that have never received an NSF award or those that have not had an award within the past five years may be the "performing organization" on a Track 2 proposal. The "performing organization" is the organization that leads and implements a funded project. The PI of the project will be employed by the "performing organization." It is acceptable for a system administrative office or other governing organization to submit the proposal and be the "awardee organization," even if that organization has received a previous NSF award. However, the campus that is the "performing organization" must not have been the performing organization on an NSF award within the past five years and must be geographically distinct and have its own chief academic officer.

### 3. Resource Hub

The Resource Hub will have a major role in supporting HSIs that have received little or no prior NSF support. The Resource Hub is also expected to facilitate development of partnerships that encourage the sharing of resources and facilities among HSIs and other institutions. The Resource Hub's efforts are expected to enhance the capability of student, faculty, and administrative leaders to take advantage of opportunities and develop solutions that improve the quality of undergraduate STEM education at their institutions. NSF expects the Resource Hub to demonstrate leadership and to coordinate community action towards improving undergraduate STEM education with special attention given to the involvement of HSIs with little or no previous experience with NSF programs, in particular, institutions eligible to submit Track 2 proposals.

Proposals for the Resource Hub should describe the evidence-based activities that will be implemented in full detail. Each activity to be implemented should have measurable objectives and outcomes. The proposal should describe the support that will be developed and/or implemented, the expertise available to carry out or lead the activities, and a detailed timeline. For planned activities that will have selected participants, the proposal should describe the strategies that will be used to identify and select participants. An external advisory committee (EAC) that includes representatives from those served by the Resource Hub (e.g., academic institutions, industry, state and local agencies, national laboratories) is required. The function of the EAC is to provide guidance and advice to the Resource Hub, as well as to ensure that the Resource Hub's activities are consistent with its vision, goals, and objectives. The proposal should describe how the proposed activities will engage different HSIs, and how the needs of Track 2 grantees will be identified, prioritized, and supported.

A plan to evaluate the success of the Resource Hub should be provided (see section below on Project Evaluation). In addition, the Resource Hub proposal should describe project outputs that will be monitored and tracked to determine how Resource Hub support has

contributed to building of capacity at HSIs, especially those with little or no funding from NSF.

Examples of potential project strategies of a Resource Hub include but are not limited to:

- Facilitating partnerships between well-established HSIs and other HSIs that either need offices of sponsored programs or need to improve their grants management infrastructure.
- Creating a mechanism to help established HSIs serve as mentors for other HSIs.
- Organizing leadership institutes to help faculty at HSIs write competitive grants, enhance pedagogical and mentoring skills, and enrich professional networks that are important in building collaborative research projects.
- Supporting prospective PIs who wish to start or improve STEM educational programs.

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

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

The budget must include adequate resources for the project evaluation. Project evaluation should be led by an 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 Report: <http://www.nsfagep.org/files/2011/04/MeasuringDiversity-EvalGuide.pdf>
- Common Guidelines for Education Research and Development: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf13126](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13126)
- User-Friendly Handbook for Mixed Method Evaluations: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf97153](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf97153)
- Evidence: An Essential Tool Report: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf0531](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf0531)
- AIHEC Indigenous Evaluation Framework Report: <https://portalcentral.aihec.org/Indigeval/Lists/IndigenousEvaluationFrmWork/AllItems.aspx>
- Evaluation e-library of the American Evaluation Association Resource Library: <http://www.eval.org/>

### III. AWARD INFORMATION

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Approximately \$30 million is anticipated, pending availability of funds for new awards in the FY2018 budget. Grants may be awarded in a wide variety of sizes and durations, as summarized below. It is expected that the budget request matches the scope of the project.

Anticipated number, duration, and size of new awards:

1. Track 1 Projects:
  - Number of awards: Up to 25 in FY18
  - Project length: Up to five years
  - Award size: \$500,000 to \$1,500,000
  - Grant administration: Continuing or standard grants
2. Track 2 Projects:
  - Number of awards: Up to 18 in FY18
  - Project length: Up to three years
  - Award size: up to \$250,000
  - Grant administration: Continuing grants
3. Resource Hub:
  - Number of awards: one award
  - Project length: Up to five years
  - Award size: up to \$3,000,000
  - Grant administration: Continuing grant



## IV. ELIGIBILITY INFORMATION

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### Who May Submit Proposals:

Proposals may only be submitted by the following:

- Eligible organizations for the HSI Program must be accredited and offer undergraduate educational programs in STEM, and satisfy the HSI definition as specified in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a), i.e., a) be an eligible institution; and b) have an enrollment of undergraduate full-time equivalent students that is at least 25 percent Hispanic students.

Certification of eligibility is required with submission of a proposal to the HSI Program. (See section V of the solicitation.)

### Who May Serve as PI:

- The Lead Principal investigator (PI) for a Track 1 proposal must be employed by the eligible institution submitting the proposal.
- The Lead PI for a Track 2 proposal must be employed by the eligible institution submitting the proposal and the institution must be either be an institution that has never received NSF funding or an institution that has not received NSF funding in the five years prior to the proposal deadline.
- The Lead PI for a Resource Hub proposal must be employed by the eligible institution submitting the proposal. The Lead PI and co-Principal Investigators (co-PIs) must include at least one member from a two-year eligible institution and at least one member from a four-year eligible institution.
- Co-PIs for any proposal are not restricted to employees of eligible institutions except for the requirement for Resource Hub proposals discussed above.

### Limit on Number of Proposals per Organization:

- An eligible institution can submit only one Track 1 or Track 2 proposal per year. However, eligible institutions submitting a proposal to Track 1 or Track 2 may also submit a Resource Hub proposal.
- An eligible institution can submit only one Resource Hub proposal.

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

- An individual may serve as the Lead PI on only one Track 1 or Track 2 proposal.
- An individual may serve as the Lead PI on only one Resource Hub proposal.
- There is no limit on the number of proposals that a co-PI may be listed on for Track 1, Track 2, or a Resource Hub. The Lead PI must be employed by an eligible institution but co-PIs are not restricted to employees of eligible institutions.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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### A. Proposal Preparation Instructions

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**Full Proposal Preparation Instructions:** Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- 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](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) 292-7827 or by e-mail from [nsfpubs@nsf.gov](mailto: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 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](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) 292-7827 or by e-mail from [nsfpubs@nsf.gov](mailto: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 the NSF FastLane system. 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.

## REQUIRED COMPONENTS FOR ALL PROPOSALS

- A. Cover Sheet: The proposal title must include the requisite prefix:
  - o Building Capacity (Track 1): Prefix: "Building Capacity:"
  - o HSIs New to NSF (Track 2): Prefix: "HSIs New to NSF:"
  - o Resource Hub: Prefix: "Resource Hub:"
- B. Project Summary (1 page): Provide an overview of the project and address the two merit review criteria: Intellectual Merit and Broader Impacts.
- C. Project Description (15 pages; including Results from Prior NSF Support): The Project Description must include 1) a discussion of the intellectual merit and broader impacts of the proposed activities as separate sections within the narrative. In addition, the project narrative must include 1) an explanation of the project's motivating rationale, goals, objectives, deliverables, and activities; and include 2) a project timeline; 3) a management plan; 4) the roles and responsibilities of the PI, co-PI(s), and other senior personnel; 5) a plan for sustainability after the period of NSF funding; 6) an evaluation plan (see Project Evaluation under Section II); 7) a dissemination plan; and 8) results from prior NSF support (see PAPPG). Submission of the evaluation plan in supplementary documents is not allowable and such proposals will be subject to return without review as they will not meet the 15-page requirement. The proposal should include a component that outlines a strategy for the integration of NSF-funded awards at the institution, if applicable. The external evaluator (external to the project) should be identified (see Project Evaluation under Section II.). PIs are cautioned that the Project Description must be self-contained and that URLs must not be used.
- D. References Cited (no page limit; see NSF PAPPG for format guidelines): Bibliography for Project Description only. If the referenced document is available electronically, the website address should also be identified.
- E. Biographical Sketch(es) Limited to two pages using NSF format. The evaluator's biosketch should be included.
- F. Budgets and Budget Justification (see Section V. B. Budgetary Information for additional budget preparation instructions).
- G. Current and Pending Support (use NSF format).
- H. Facilities, Equipment and Other Resources (use NSF format). Proposers should include an aggregated description of the internal and external resources (both physical and personnel) that the organization and its collaborators will provide to the project, should it be funded. No quantifiable financial information should be provided. Such information must be provided in this section, in lieu of other parts of the proposal (e.g., budget justification, project description). The description should be narrative in nature and must not include any quantifiable financial information. See PAPPG for additional information. Please note that this section is a required part of the proposal.
- I. Special Information/Supplementary Documents. Documents should include: HSI Certification Form signed by the institutional representative (<https://nsf.gov/ehp/HSIProgramPlan.jsp>), Postdoctoral Mentoring Plan (1 page; if applicable); Data Management Plan (2 pages) (see link to EHR-specific requirements at: <https://www.nsf.gov/bfa/dias/policy/dmp.jsp>); Letters of Collaboration (see Special Information and Supplementary Documentation section below); and Quotes for Equipment (if applicable).

All information necessary for the review of a proposal must be contained in Sections a through i of the proposal. Appendices may not be included.

### Special Information and Supplementary Documentation:

Please refer to the PAPPG for guidance. In addition to following the PAPPG, the HSI Program requires:

1. A listing of all of the known people (aside from participants and students) who will receive compensation from the project and their affiliation.
2. Letters of Collaboration that document what is being committed that is of significance to the project. Letters that merely endorse the project or offer nonspecific support for project activities should not be included and the proposal may be returned without review if general support letters are included.
3. Resource Hub submissions only: a letter from the president or chief academic officer of the performing institution documenting the institution's commitment to the Resource Hub.

Review the regulations regarding Human Subjects (45 CFR 690.101-124 <https://www.nsf.gov/bfa/dias/policy/human.jsp>). Please note that Human Subjects regulations also govern activities that pertain to safeguarding individually identifiable information such as student and faculty surveys and data. Therefore, some 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 for 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.

Proposers are reminded to identify the HSI 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.

## B. Budgetary Information

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### Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

### Other Budgetary Limitations:

Equipment Limitations:

- Track 1 and 2 projects - Equipment costs cannot exceed 30% of the total NSF budget requested.
- The Resource Hub project is not intended to support implementation activities; therefore, major equipment is not normally

included. However, minimal equipment costs (less than 1% of the direct costs) are allowed if required to perform the project activities.

#### **Budget Preparation Instructions:**

##### Other Budgetary Requirements

1. **Required Meeting Travel:** All proposals should budget for the PI to attend a one to two day grantee meeting in the Washington, DC area every year of the project.
2. **Student Support:** Financial support may be provided to student participants under the HSI Program projects. However, financial support may only be provided to students that are U.S. citizens, nationals, or permanent residents.
3. **Professional Development Workshops:** In proposals that involve professional development workshops, reasonable travel costs and costs for subsistence (lodging and meals) during the workshop may be included in project budgets. In addition, funds may be requested for a reasonable stipend per workshop day for participants; requests for such stipends must be specific to the target audience and must be fully justified—for example, to assure participation by faculty with few professional development opportunities or from institutions that justify need.
4. **Evaluation:** The funds to support an evaluator independent of the project must be requested. The requested funds must match the scope of the proposed evaluative activities. The evaluator may be employed by a project's home institution, as long as he or she works in a separate organizational unit (e.g., a different department) that has a different reporting line than that of the project's home unit.

NSF project funds may not be used for:

- equipment or instrumentation that is not mainly for use in the project;
- replacement equipment or instrumentation that does not significantly improve instructional capability;
- teaching aids (e.g., films, slides, projectors, "drill and practice" software);
- vehicles, trailers, laboratory furnishings, or general utility items such as office equipment (including word-processing equipment), benches, tables, desks, chairs, storage cases, and routine supplies;
- maintenance equipment and maintenance or service contracts;
- modification, construction, or furnishing of laboratories or other buildings;
- installation of equipment or instrumentation (as distinct from the on-site assembly of multi-component instruments--which is an allowable charge).

## **C. Due Dates**

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

March 06, 2018

## **D. FastLane/Grants.gov Requirements**

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#### **For Proposals Submitted Via FastLane:**

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

#### **For Proposals Submitted Via Grants.gov:**

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: <http://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](mailto: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 are strongly encouraged to use FastLane 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

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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/](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 *Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018*. 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

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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.

## B. Review and Selection Process

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

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

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell 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

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### A. Notification of the Award

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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

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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](https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [nsfpubs@nsf.gov](mailto: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=papppg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=papppg).

### 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 any time 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 the Resource Hub annually.

The Resource Hub shall convene, at least annually, an external advisory group or committee (EAC). The advisors should include representatives from those served by the Resource Hub (e.g., academic institutions, industry, state and local agencies, national laboratories) and reflect the diversity of participants inherent in the citizenry of the United States. Persons with a financial, institutional, or collaborative connection to the Resource Hub may not serve as members of the EAC.

All HSI Program awardees are required to submit an annual evaluation of the project.

Cooperation with NSF evaluation projects and special projects: NSF, an NSF contractor, or a grantee on behalf of NSF, may from time to time conduct program evaluations or special projects of HSI Program projects. These may occur at any time 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

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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=papppg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=papppg).

## VIII. AGENCY CONTACTS

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*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:

- For general inquiries, contact: [NSF-EHR-HSI@nsf.gov](mailto:NSF-EHR-HSI@nsf.gov)
- Andrea Johnson, Program Director, telephone: (703) 292-5164, email: [andjohns@nsf.gov](mailto:andjohns@nsf.gov)

- Talitha M. Washington, Program Director, telephone: (703) 292-8670, email: [twashing@nsf.gov](mailto:twashing@nsf.gov)
- Joan M. Walker, Program Director, telephone: (703) 292-7016, email: [jowalker@nsf.gov](mailto:jowalker@nsf.gov)
- Ellen Carpenter, Program Director, telephone: (703) 292-5104, email: [elcarpen@nsf.gov](mailto:elcarpen@nsf.gov)
- Toni Edquist, Program Specialist, telephone: (703) 292-4649, email: [tedquist@nsf.gov](mailto:tedquist@nsf.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto:fastlane@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](mailto: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 <http://www.grants.gov>.

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