



Improving Undergraduate STEM Education: Hispanic-Serving Institutions HSI PROGRAM 19-540

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

- NSF established HSI Program in response to the Consolidated Appropriations Act, 2017 and the American Innovation and Competitiveness Act
- The HSI Program seeks to:
 - Enhance the quality of **undergraduate STEM** education at HSIs
 - Increase **retention** and **graduation** rates of undergraduate students pursuing degrees in STEM fields at HSIs
 - **Build capacity** at HSIs that typically do not receive high-levels of NSF grant funding

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HSI Program Solicitation, NSF 19-540

- HSI Program website:

<https://nsf.gov/ehr/HSIProgramPlan.jsp>

FAQs, data from listening sessions, and announcements

- HSI Program solicitation, **NSF 19-540**:

<https://www.nsf.gov/pubs/2019/nsf19540/nsf19540.pdf>

- Prospective New Awardee Guide:

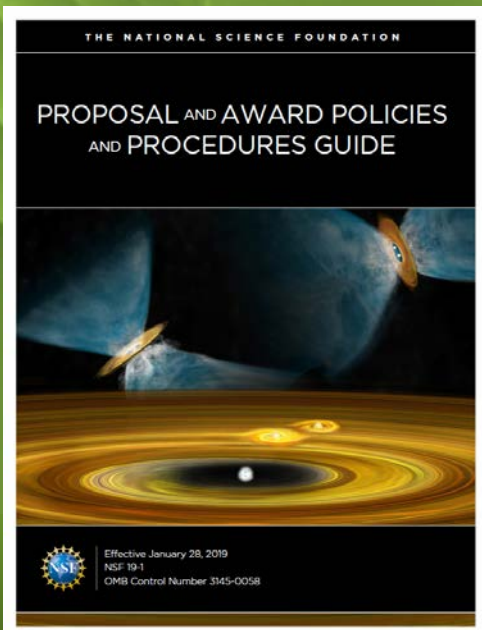
<https://www.nsf.gov/pubs/2018/nsf18033/nsf18033.pdf>

- Proposal and Award Policies and Procedures Guide (PAPPG):

https://www.nsf.gov/pubs/policydocs/pappg19_1/nsf19_1.pdf

Gives step by step instructions on proposal preparation in Chapter II

Alert: This webinar is **not** all-inclusive. Read the entire solicitation and the PAPPG 19-1 for all of the requirements.



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HSI PROGRAM

Institutional Eligibility

- Institutions 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 a full-time equivalent enrollment of undergraduates that is at least 25% Hispanic.
- **Certification of eligibility** is required with submission of a proposal to the HSI Program.
 - <https://nsf.gov/ehr/Pubs/HSICertForm.pdf>

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Supported Activities

- Projects are expected to be **evidence-based** as well as **generate new knowledge** about how to enhance undergraduate STEM education to increase retention and graduation rates of undergraduate students pursuing degrees in STEM fields at HSIs.
- The HSI Program will support activities that:
 - ✓ improve **STEM learning** and learning environments,
 - ✓ **broaden participation** in STEM,
 - ✓ **build institutional capacity** for STEM learning, and/or
 - ✓ develop the professional **STEM workforce** of tomorrow.

HSI PROGRAM Tracks

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**Track 1: Building
Capacity**

**Track 2: HSIs New
to NSF**

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Track 1: Building Capacity

Priority Area 1: Critical Transitions

Priority Area 2: Innovative Cross-Sector Partnerships

Priority Area 3: Teaching and Learning in STEM

- Proposals should focus on one or more of these priority areas, as appropriate to the project goals.
- The proposal should identify its priority area(s) in both the **overview of the Project Summary** and the **body of the proposal**.

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Track 1: Building Capacity

Priority Area 1: Critical Transitions

- Lower- to upper-division coursework
 - Two-year to four-year institutions
 - Secondary education to undergraduate education of students enrolled in a STEM undergraduate degree-granting program
-
- Proposals should include **institutional data** that demonstrates a **need** for the proposed project.
 - The proposed project should **identify** and **investigate factors** that affect student success and subsequent graduation.
 - Institutional partnerships should have in place or plan to develop **articulation agreements** for the transfer of students from one institution to another that leads to STEM degree attainment.
 - Successful **project leadership teams** will typically include STEM administrators and those who specialize in higher education issues and processes.

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Track 1: Building Capacity

Priority Area 1: Critical Transitions

Sample Questions for Investigation

- What culturally responsive instructional and curricular practices contribute to successful navigation of critical transition points in undergraduate education?
- What institutional indicators or cultural factors should be considered in curricular redesign and alignment efforts that increase STEM degree completion?
- How does institutional data indicate the need for the redesign and/or alignment to support transitions in STEM programs?

*Read the solicitation for **more** sample questions to investigate.*

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Track 1: Building Capacity

Priority Area 2: Innovative Cross-Sector Partnerships

- Develop cross-sector partnerships that lead to increased student engagement in STEM research and learning experiences while also generating knowledge about how cross-sector partnerships contribute to STEM teaching and learning, and workforce development.
- Partners may include industry, government, academic institutions, non-profit organizations, and local communities.
- Projects should prepare students for future STEM careers by increasing access to experiential professional development opportunities.
- Projects may provide opportunities for faculty engagement in interdisciplinary and cross-sector STEM research.
- These projects are also expected to inform best practices for STEM workforce development in higher education.

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Track 1: Building Capacity

Priority Area 2: Innovative Cross-Sector Partnerships

Sample Questions for Investigation

- What new knowledge can be generated about how cross-sector partnerships contribute to STEM teaching and learning and workforce development?
- How do cross-sector partnerships develop and/or apply culturally competent approaches to enhance the undergraduate STEM experience?
- How do cross-sector student research experiences lead to increased recruitment and retention of a diverse STEM workforce?

*Read the solicitation for **more** sample questions to investigate.*

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Track 1: Building Capacity

Priority Area 3: Teaching and Learning in STEM

- Projects should generate new knowledge about teaching and learning strategies and curricular models that improve undergraduate STEM education for a culturally diverse student population.
- Projects may also create and adapt learning materials and teaching strategies to enhance STEM learning that lead to measurable gains and implementable models.
- Projects enhance understanding of how students learn STEM topics and how faculty adopt culturally relevant instructional approaches in STEM.
- Projects may include investigators (internal or external to the institution) with demonstrated expertise in education research and/or social science research methods, as well as knowledge about STEM programs.

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Read the solicitation for more sample questions to investigate.

Track 1: Building Capacity

Priority Area 3: Teaching and Learning in STEM

Sample Questions for Investigation

- How does training in implicit bias or cultural competence contribute to teaching effectiveness of faculty and staff, student sense of belonging and learning, and institutional culture at all levels?
- What kinds of faculty development lead to increased use of innovative, culturally relevant, and evidence-based teaching approaches? What aspects of faculty development lead to student engagement, learning and degree attainment?
- How do teaching supports (such as graduate or undergraduate teaching assistants, near-peer mentoring, or learning assistants) contribute to student learning and engagement and degree attainment?

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Eligibility for Track 1: Building Capacity

- An institution can **submit only one proposal**.
 - An institution that is part of a larger system is considered separate for proposal submission purposes if it is geographically separate from the other campus(es) and has its own chief academic officer.
- **Who May Serve as PI:**
 - The Lead Principal Investigator (PI) **must** be employed by the eligible institution submitting the proposal.
 - Co-PIs are **not** restricted to employees of eligible institutions.

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Track 2: HSIs New to NSF

- Build capacity in undergraduate STEM education at HSIs that either have never received NSF funding or have not received funding from NSF in the five years prior to the proposal deadline.
- Stimulate implementation, adaptation, and innovation in one or more of the three priority areas identified in Track 1.
- Projects will develop **evidence-based** innovative models that address retention and graduation rates of students pursuing associate or baccalaureate degrees in STEM.
- Anticipated **new knowledge** to be generated from the project should be described.
- It is expected that some of the funded Track 2 projects will serve as pilots for ideas that may be expanded in future proposals in Track 1 or other NSF programs.

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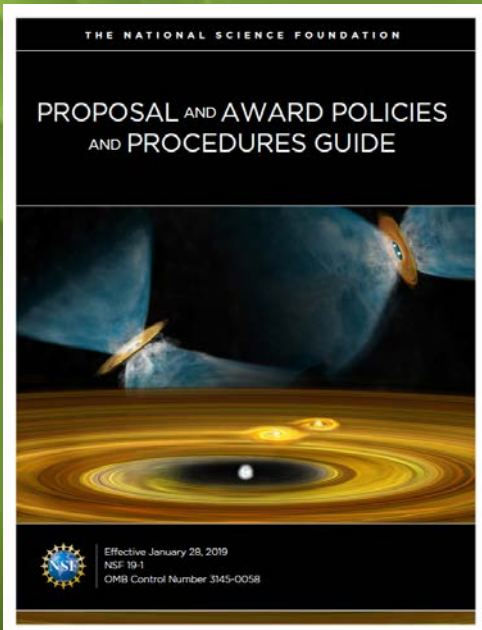


Eligibility for Track 2: HSIs New to NSF

- Proposals will only be accepted from eligible institutions that have never received NSF funding or have **not received funding from NSF** in the **five years prior** to the proposal deadline.
- The Lead Principal investigator (PI) must be employed by the eligible institution submitting the proposal.
- There are no restrictions or limits on the number of proposals per organization.

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Conferences

- Proposals for conferences addressing critical challenges in undergraduate STEM education at HSIs may be submitted at any time **following consultation with a program officer.**
- Conference proposals that address increasing the diversity of institutions and faculty participating in the HSI Program are encouraged.
- Proposals may involve collaborations of education researchers and scientists in the STEM disciplines to ensure that undergraduate STEM education addresses the cultural differences of diverse student populations.
- Information about preparing a Conference Proposal is contained in PAPPG [Chapter II.E.7.](#)

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Research Design

- The **research design** addresses a research question and/or hypothesis that is important to the project and the field, and is appropriate to the **size** and **scope** of the project.
- All proposals should be based on relevant current literature and evidence-based practices.
- The research plan should be managed by the project leadership team.
- **Successful proposals** will have well aligned research questions/hypotheses, methods, analyses, project activities, and project evaluation.

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Research Plan Components

- One or more explicit research questions and/or hypotheses that are aligned with and grounded in the research literature.
- Research questions and/or hypotheses, methodologies and analyses aligned with project activities and project evaluation.
- Identification and description of the data to be collected, measurement instruments or procedures to be used in collecting data, and evidence of the reliability and validity of instruments.
- Identification of the analytic or other proposed procedures for data analyses as related to project hypotheses or research questions.

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Research Plan Components

- A detailed plan and timeline of how the project design phases will be developed to inform the project's research questions and/or hypotheses.
- Inclusion of education research or social science research expertise may be helpful on the project leadership team to provide guidance in research design or methodologies, instrument implementation or development, data analysis, or qualitative research procedures as appropriate.
- Proposals are encouraged to be informed by the *Common Guidelines for Education Research and Development*:
https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13126

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Project Evaluation: Measures to Assess Success

- The **evaluation plan** examines all aspects of the project activities to inform the project's progress towards its goals, and is appropriate to the size and scope of the project.
- The evaluation must be led by an **expert independent** evaluator or evaluation team, and their biographical sketch must be included (as supplementary documentation).
- Proposals should indicate (e.g., through the inclusion of a logic model) the connections among project goals, activities, outputs, and outcomes.
- All awardees are required to submit an annual evaluation of the project in the annual and final project reports.

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A Project Evaluation Plan Should:

- Explain why the plan is appropriate given the size and scope of the project.
- Describe the qualitative and/or quantitative measures that will inform the project team about progress toward achieving goals and specific objectives.
- Provide a timeline that clarifies responsibilities for generating, interpreting, and using evidence of success.
- Describe how the evidence arising from these critical reviews will be utilized (e.g., for continuous quality improvement, program management, and/or accountability purposes).
- Indicate how input from the independent evaluator or evaluation team will inform the design, conduct, and interpretation, use, and dissemination of findings resulting from activities to assess success.

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Award Information

Approximately \$15 million is anticipated, pending availability of funds.

Track 1: Building Capacity

- Number of awards: Up to 10 in FY19
- Project length: Up to **five years**
- Award size: Up to **\$2,500,000**

Track 2: HSIs New to NSF

- Number of awards: Up to **5** in FY19
- Project length: Up to **three years**
- Award size: Up to **\$300,000**

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NSF Merit Review Criteria

- Both criteria, **Intellectual Merit** and **Broader Impacts**, will be given full consideration during the merit review and decision-making process. Each criterion is necessary but neither, by itself, is sufficient. Proposers must fully address both criteria.

The following elements will be considered in the proposal's review.

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**)?

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NSF Merit Review Criteria Continued

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 institution to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

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*FastLane is
recommended.*



Required Proposal Components

a. Coversheet:

- In **FastLane**, choose the HSI Program solicitation number and fill out the **Project Data Form**.
- Check the HUMAN SUBJECTS box with the applicable IRB status.

b. Project Data Form: Please consider using **FastLane**. Select the appropriate Track in the dropdown menu.

c. Project Summary (1 page):

- Include an Overview, a statement on Intellectual Merit, and a statement on Broader Impacts.
- Clearly describe the nature of the project and indicate the key guiding research questions and/or hypotheses being addressed.
- In the Overview, indicate which priority areas are addressed.

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Required Proposal Components

- d. **Project Description** (15 pages; including Results from Prior NSF Support; see solicitation)
 - i. Include a separate section labeled “Intellectual Merit” as well as a separate section labeled “Broader Impacts.”
 - ii. Proposals should discuss existing institutional programs and initiatives that are relevant to the project. Existing activities should not be included as proposed activities to be supported by the project.
 - v. The project leadership team must include a **STEM faculty member** currently teaching in one of the STEM disciplines. It is expected that projects will include investigators (internal or external to the institution) with demonstrated expertise **in education research and/or social science research methods**.
- e. **References Cited** (no page limit; see NSF PAPPG for format guidelines; see solicitation)
- f. **Biographical Sketches**
 - Limited to two pages using NSF format

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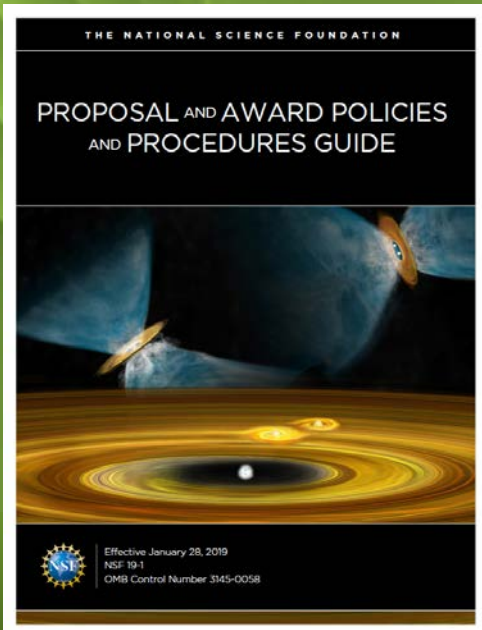


Required Proposal Components

- g. Budgets and Budget Justification (see NSF PAPPG)**
- **Required Meeting Travel:** All proposals should budget for the PI to attend a one to two-day grantee meeting each year of the project.
 - **Student Support:** Financial support may be provided to student participants (U.S. citizens, nationals, or permanent residents).
 - **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.
 - **All proposals** must include funds for the project evaluation.

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Required Proposal Components

g. Budgets and Budget Justification (Continued)

- Clearly state that you used the university's negotiated indirect cost (IDC) rate and state clearly what categories the rate is applied to and what the percentage is in each category.
- Include a detailed budget justification.
- Have your sponsored research office (SRO) review your budget carefully.
- Voluntary committed cost sharing is prohibited.
- Equipment costs cannot exceed 30% of the total NSF budget requested.
- NSF funds may not be used to support expenditures that would normally be made in the absence of an award, such as costs for routine teaching activities (including curriculum development) and laboratory upgrades (supplies and computers).
- **Follow the PAPPG closely** when preparing the budget, especially where participant support is involved.

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Required Proposal Components

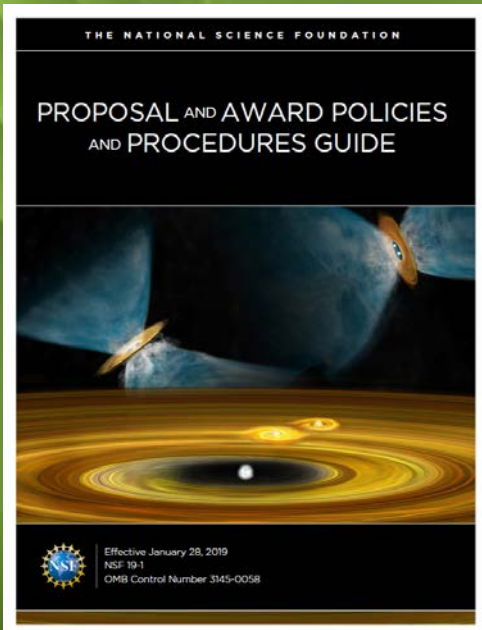
h. Current and Pending Support (use NSF format)

i. Facilities, Equipment and Other Resources

- Describe all organizational resources necessary for, and available to, the project.
- Proposers should describe only those resources that are directly applicable.
- 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.
- The description should be narrative in nature and must not include any quantifiable financial information.

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Required Proposal Components

j. Special Information / Supplementary Documents

- **Postdoctoral Mentoring Plan** (1 page; if applicable)
- **Data Management Plan** (2 pages) Follow the guidance in the PAPPG and the Directorate for Education and Human Resources (<https://www.nsf.gov/bfa/dias/policy/dmp.jsp>).
 - ✓ Other Resource: <https://dmptool.org>
- **HSI Certification Form:** <https://nsf.gov/ehr/HSIProgramPlan.jsp>
- **Biographical sketch of the independent evaluator(s)** must be included and uploaded as a single PDF file in the Other Supplementary Documents section of the proposal.
- **Letters of Support** 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.

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*Need more
information?*

Contact Steve Turley:
rturley@nsf.gov

Dear Colleague Letter: **STEM Workforce Development Utilizing Flexible Personal Learning Environments**

NSF 19-025

<https://www.nsf.gov/pubs/2019/nsf19025/nsf19025.jsp>

- For proposals that support flexible personalized learning to prepare the **STEM workforce** of the future.
- Includes the design, development, implementation, and analysis of online courses in model-based engineering, model-based systems engineering, mechatronics, robotics, data science and sensor analytics, program management, and artificial intelligence.
- Projects will broadly inform development of personalized learning systems or generalize the research results generated during the deployment of online courses.
- For new proposals, principal investigators must refer to this DCL in the overview statement of the **Project Summary** and in the **Project Description**.
- The Project Description should also include a brief description about **how** the project supports **flexible personalized learning**, thus complementing the work funded by the Boeing gift.

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HSI Program Officers



Minerva
Cordero, HRD,
co-Lead



Talitha
Washington,
DUE, co-Lead



Ellen
Carpenter,
DUE



Tom Higgins,
DUE



Andrea
Johnson,
DUE



Karen
Keene, DUE



Dawn
Rickey,
DUE



Pushpa
Ramakrishna,
DUE



Bob
Russell,
DRL



Victor
Santiago,
HRD



M. Alejandra
Sorto, DRL



R. Steve
Turley, DUE



Joan Walker,
DRL

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*FastLane is
recommended.*



Questions?

FAQs:

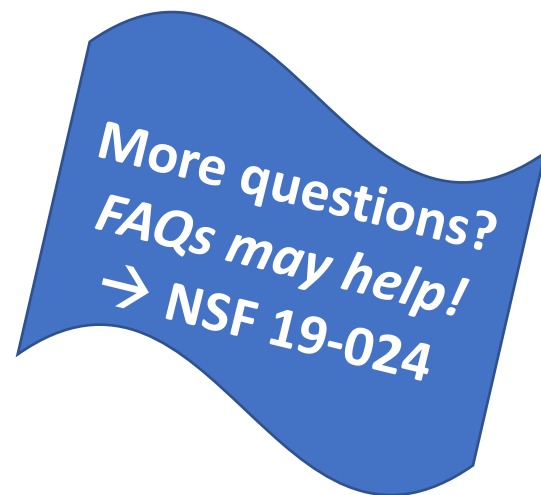
<https://www.nsf.gov/pubs/2019/nsf19024/nsf19024.pdf>

Minerva Cordero
mcordero@nsf.gov

703-292-7377

Talitha Washington
twashing@nsf.gov

703-292-4640



For general inquiries, contact: NSF-EHR-HSI@nsf.gov