NSF Scholarships in STEM (S-STEM)

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Division of Undergraduate Education (DUE)
Directorate for Education and Human Resources (EHR)

Quality Education for Minorities (QEM) Network
Proposal Workshop for the National Science Foundation (NSF)’s Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Program
February 23, 2018
Directorate for Education and Human Resources (EHR) Goals

✓ Prepare the next generation of STEM professionals and attract/retain more Americans to STEM careers

✓ Develop a robust research community that can conduct rigorous research and evaluation to support excellence in STEM education

✓ Increase the technological, scientific and quantitative literacy of all Americans

✓ Broaden participation and close achievement gaps in all STEM fields
EHR’s Organizational Structure

Office of the Assistant Director

- Division of Research on Formal and Informal Settings (DRL)
- Division of Graduate Education (DGE)
- Division of Human Resource Development (HRD)
- Division of Undergraduate Education (DUE)
Division of Undergraduate Education (DUE)

- **ATE (NSF 17-568)**
  - Focuses on the education of technician to meet workforce demands in existing and emerging advanced technological fields.

- **IUSE: EHR (NSF 17-590)**
  - Works to improve the effectiveness of undergraduate STEM education, educate students to become leaders and innovators in STEM, and to provide a foundation in scientific literacy for all students.

- **Noyce (NSF 17-541)**
  - Encourages talented STEM majors and STEM professionals to become K-12 STEM teachers.

- **S-STEM (NSF 17-527)**
  - Supports institutional scholarship programs for full-time, academically-talented STEM students with demonstrated financial need.
Mission of the S-STEM Program

➢ To provide scholarships to academically talented, low-income students with demonstrated financial need in order to increase STEM degree attainment and enhance the homegrown STEM workforce, thus ensuring the competitiveness of the United States in the global workforce market
S-STEM Portfolio (Since 2006)

493 Active Awards, 997 Total Awards
- HSI – 68
- HBCU – 22
- Tribal Colleges – 2

Awards by Discipline

- INT 56%
- ENG 15%
- GEO 1%
S-STEM Program: Core Ideas

• Enhances the national STEM workforce by increasing
  – # of students who graduate with STEM degrees
  – # of students entering the STEM workforce

• Provides scholarships to students who
  – Have academic promise to succeed in STEM
  – Are low-income with demonstrated financial need

• Funded by H-1(B) visa fees authorized by U.S. Congress transferred to NSF (≈$100M annually)
The S-STEM Program: Brief Summary

• Funding
  – At least 60% of the funds must be used for scholarships (direct financial support to students)
  – Up to 40% of funds may be used for other components: support structures, research, recruitment, mentoring, etc.

• Required Elements
  – Provide **faculty mentors** for S-STEM Scholars
  – Develop a **cohort experience** for the scholarship recipients.
  – **Generate knowledge** about “what works” for S-STEM Scholars
  – **Evaluate** and **disseminate** what your project did
S-STEM Program: Goals

1. To increase the recruitment, retention, student success, and graduation (and transfer) of low-income academically talented students in STEM.

2. To implement and study models, effective practices, and/or strategies that contribute to success in STEM.

3. To contribute to the implementation and sustainability of effective curricular and co-curricular activities in STEM education.
S-STEM Program Summary

Division of Undergraduate Education (DUE)

NSF Solicitation 17-527

Deadline: March 28, 2018

Three Program Tracks

Institutional Capacity Building

(Track 1)
Single Institution

Up to $650K
Up to 5 yrs

For institutions with limited experience in implementing effective curricular/ co-curricular activities and no previous S-STEM awards

Design and Development

(Track 2)
Single Institution

Up to $1M
Up to 5 yrs

(Track 3)
Multi-institutional Consortia

Up to $5M
Up to 5 yrs

Seeks to leverage S-STEM funds with institutional efforts and infrastructure to increase and understand impacts

Two Tracks
S-STEM Proposal Categories

• S-STEM Institutional Capacity Building *(newbies)*
  – **Track 1:** Capped at $650k for a maximum duration of 5 years

• S-STEM Design and Development
  – **Track 2:** Single Institution *(classic/oldies)*
    Capped at $1M for a maximum duration of 5 years
  – **Track 3:** Multi-Institution Consortia *(biggies)*
    Capped at $5M for a maximum duration of 5 years
Track 1: Institutional Capacity Building

• $650,000 for a maximum duration of 5 years
• At least 60% of total amount requested must be requested for scholarships for low-income academically talented students
• Increase recruitment, retention, student success, (transfer), and completion of STEM degrees by low-income talented students with demonstrated financial need, and entry into the workforce or graduate studies
• Develop, test and implement strategies for student success and cohort maintenance; report findings to community
• Establish new collaborative partnerships and infrastructure
Track 2: Design and Development (Single Institution)

- Up to $1M for 5 years
- At least 60% of total amount requested must be requested for scholarships
- Increase recruitment, retention, student success, transfer, if appropriate, and completion of STEM degrees by talented students with demonstrated financial need, and their entry into the workforce or graduate studies
- Adapt and build upon approaches for student success and contribute to STEM education knowledge base
- Encouraged to implement and study cognitive and non-cognitive aspects of student experiences and success
Track 3: Design and Development
(Multi-Institution Consortia)

• Up to $5M for 5 years.
• At least 60% of total amount requested must be requested for scholarships
• Increase recruitment, retention, student success and completion of STEM degrees by talented students with demonstrated financial need, and their entry into the workforce or grad school
• Implementation, adaptation and investigation of common approaches for student success
• Make significant contributions to STEM undergraduate education knowledge base about factors impacting S-STEM students
• Encouraged to implement and study cognitive and non-cognitive aspects of student experiences and success
• Implement and study a common set of effective practices across multiple collaborating institutions (either similar or different)
Some Helpful Tidbits For Getting Funded By NSF
Read the Solicitation and the PAPPG!

NSF Scholarships in Science, Technology, Engineering, and Mathematics Program (S-STEM)

S-STEM 2018 Q&A, Webinars, and FAQs

2018 webinar information, narrated Powerpoint Presentations, and additional information related to the S-STEM (17-527) solicitation are available on the following page. click here. The NSF S-STEM Frequently Asked Questions (FAQs) is available here.

CONTACTS

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PROGRAM GUIDELINES

Solicitation 17-527
Important Information for Proposers
NSF Merit Review Criteria
For All Proposals

• What is the potential for the proposed activity to make a difference?
  ➢ Intellectual Merit: By advancing knowledge and understanding within its own field or across different fields; and
  ➢ Broader Impacts: By benefitting society or advancing desired societal outcomes?

• To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

• 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?

• How qualified is the individual, team, or institution to conduct the proposed activities?

• Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?
Writing the Project Summary

• Consider writing the summary using these questions in this order:
  1. What will you do?
  2. Why is it important?
  3. What has already been done?
  4. How are you going to do it and how is your approach special (innovative, creative)?

• Don’t forget:
  ✓ The Intellectual Merit (technical, scientific contributions) in the second paragraph
  ✓ The Broader Impact in the third paragraph
When Writing Your Proposal

• Goals
  ✓ What are you trying to accomplish?
  ✓ What will be the outcomes?

• Rationale
  ✓ Why do you believe that you have a good idea?
  ✓ Why is the problem important?
  ✓ How does it tie into previous literature/efforts?
  ✓ Why is your approach promising?

• Evaluation
  ✓ How will you manage the project to ensure success?
  ✓ How will you know if you succeed?

• Dissemination
  ✓ How will others find out about your work?
  ✓ How will you interest them?
  ✓ How will you excite them?
Project Leadership and Management Team

• For all projects the project leadership team must include a (1) faculty member currently teaching in an S-STEM, a (2) STEM administrator, and (3) an institutional, educational, or social science researcher.

• For Track 1 and Track 2 projects, the Principal Investigator (PI) must be a faculty member currently teaching in one of the S-STEM disciplines who can provide the leadership required to ensure the success of the project.

• For Track 3 projects, the PI must be a faculty member currently teaching in one of the S-STEM or an institutional, educational, or social science researcher who can provide the leadership required to ensure the success of the project.
Scholarship Recipients

- United States citizens, nationals, aliens admitted as refugees, or aliens lawfully admitted to the United States for permanent residence
- Enrolled full time in a program leading to an associate, baccalaureate, or graduate degree in one of the following disciplines for each term for which a student receives a scholarship:
  - Biological sciences (except medicine and other clinical fields); physical sciences, including physics, chemistry, astronomy, and materials science; mathematical sciences; computer and information sciences; geosciences; engineering; or technology areas associated with the preceding fields (e.g., biotechnology, chemical technology, engineering technology, information technology)
- Demonstrate academic ability or potential
- Be low-income and demonstrate financial need, defined for undergraduate students by the U.S. Department of Education rules for need-based Federal financial aid Free Application for Federal Student Aid (FAFSA), or, for graduate students, defined as financial eligibility for Graduate Assistance in Areas of National Need (GAANN).
Student Selection Process and Criteria

• Should include indicators of:
  ▪ Academic merit (e.g., grade point average, placement test results)
  ▪ Professionalism (e.g., motivation, ability to manage time and resources, communication skills)

• Encourage projects to recruit a diverse applicant pool

• The proposal should indicate how students' eligibility will be determined, the mechanisms by which scholarships for students will be provided, and how scholarship program outcomes will be evaluated and disseminated.

• It should also identify criteria for retention of students' scholarships from one year to the next.
Research versus Evaluation

Soup As Metaphor

- **Research**
  - What happens to the soup’s flavor when I use different ingredients?
  - How does the rate of cooling change when I use different bowls?

- **Evaluation**
  - Did I use appropriate procedures to make the soup?
  - Did I adequately consider the possible ingredients I might use?
S-STEM: Knowledge Generation

- **Generate knowledge** about factors and/or activities associated with retention, student success, transfer, academic/career pathways, and degree attainment
- Projects should:
  - Be based on the information needs of the institution
  - Draw on the research literature on evidence-based practices, student success, and degree attainment
  - State questions that guide the investigations
  - Describe how the questions will be answered
- Projects should include **formal research questions** that are explored and/or an explicit description of their plans and processes for knowledge generation.

✓ We want to **learn how** to best award scholarships to have the maximum impact!
Assessment and Evaluation

• Have clear and specific plans for assessment and evaluation that are clearly aligned with the stated goals of the project
• Evaluation should include formative evaluation for project improvement and summative evaluation to assess and document project outcomes, accomplishments, and lessons learned
• Evaluator must be external to the project, but not necessarily to the institution.
• The evaluator cannot be a Co-PI or other Senior Personnel on the project.
• S-STEM projects are required to participate in regular NSF-led data collection activities to track the students.
  ▪ Beyond the impact on students, S-STEM projects should collect data to judge impact on the departments, disciplines involved, and the institution.
Intellectual Merit of S-STEM Proposals

- Is the **need** or **problem** identified (to which the S-STEM project is a solution) clearly described? (Note: This should be more than financial need of students - all proposals submitted are due to financial need.)
- Is there relevant **data** of student retention and graduation rates?
- Do the PIs and senior personnel have the knowledge, experience and expertise to effectively **lead** the project?
- Is there a well-crafted plan to **recruit** students with demonstrated academic ability or potential and financial need to assure a sufficient pool from which to select the number of scholars proposed?
- Are the **selection criteria** indicative of seeking talented scholars?
- What is the quality of the **academic program** for scholars?
- How does the project assure quality in the **support/resources** for scholars?
- Are you convinced that the project will be well **managed**?
Broader Impacts of S-STEM Proposals

- Is the **number** of students and faculty involved appropriate for the scale and scope of the project?
- Will the project offer career **pathways** for students?
- What will be the **legacy** within the department(s), the institution and beyond? Is there a plan?
- If there is a plan to **diversify** the STEM workforce does it clearly show how it will recruit and support the students into studying STEM disciplines?
- Is the **evaluation plan** going to provide the PIs with useful feedback and guidance to make mid-course corrections?
- Will **knowledge generated** benefit the broader STEM education community?
NSF Proposal & Award Process Timeline

1. NSF Announces Opportunity
2. Research & Educational Communities
3. Submit
4. NSF Program Officer:
   - Ad Hoc
   - Panel
   - Combination
   - Internal
5. Program Officer Analysis and Recommendations
6. DD Concur
7. Award via DGA
8. Organization

Proposals can be returned without review/withdrawn.

Timeline:
- Proposal Preparation: 90 Days
- Proposal Receipt to DD Concurrence of PO Recommendation: 6 Months
- DGA Review & Processing: 30 Days
- DD Concur
- Award
Reasons for Return of Proposals Without Review

• It is inappropriate for funding by the National Science Foundation.
• It is substantially similar to either a proposal already under consideration by NSF from the same submitter, or a proposal that was already awarded.
• It does not meet NSF proposal preparation requirements, such as page limitations, formatting instructions, and electronic submission, as specified in the PAPPG or program solicitation.
• It does not meet an announced proposal deadline date (and time, where specified).
• It is submitted with insufficient lead time before the activity is scheduled to begin.
• It was previously reviewed and declined and has not been substantially revised.
Typical Format of a Review

• General summary of project (2-3 sentences)

• Intellectual merit
  ➢ Strengths
  ➢ Weaknesses/concerns

• Broader impacts
  ➢ Strengths
  ➢ Weaknesses/concerns

• Summary statement (2-3 sentences)

• Overall Rating

Rating the Proposal

• Excellent
• Very Good
• Good
• Fair
• Poor
Documentation Received to Proposer/PI from the Merit Review

• Verbatim copies of individual reviews, excluding reviewer identities
• Panel Summary or Summaries (if panel review was used)
• Context Statement (usually)
• PO to PI comments (formal or informal, written, email or verbal) as necessary to explain a decision
Funding Decisions

• The merit review panel summary provides:
  ✓ Review of the proposal and a recommendation on funding.
  ✓ Feedback (strengths and weaknesses) to the proposers.

• NSF Program Officers make funding recommendations guided by program goals and portfolio considerations.

• NSF Division Directors either concur or reject the Program Officer’s funding recommendations.
Issuing the Award

• NSF’s Division of Grants and Agreements (DGA) reviews the recommendation from the program office for business, financial, and policy implications.

• NSF’s grants and agreements officers make the official award as long as:
  ✓ The institution has an adequate grants management capacity.
  ✓ The PI/Co-PIs do not have overdue annual or final reports.
  ✓ There are no other outstanding issues with the institution or PI.
Questions?

Ask Early, Ask Often!
Workshop Activity: Think, Pair, Share

• **Think** by yourself
  - Read the proposal, write down *your individual* IM & BI strengths and weaknesses, give the proposal a rating.

• **Pair** with your panel
  - Discuss the proposal, write down *your collective* IM & BI strengths and weaknesses, maybe modify your rating.

• **Share** with everyone
Debrief: Intellectual Merit & Broader Impacts

• What is the potential for the proposed activity to make a difference?
  - Intellectual Merit: By advancing knowledge and understanding within its own field or across different fields; and
  - Broader Impacts: By benefitting society or advancing desired societal outcomes?

• To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

• 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?

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