Grant Opportunities in the NSF Division of Undergraduate Education

Workshop for New Physics and Astronomy Faculty
June 28, 2018

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Corby Hovis

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

• About NSF
• Division of Undergraduate Education Programs
• Questions and Answers
NSF’s Mission:

“...to promote the progress of science;
to advance the national health, prosperity, and welfare;
to secure the national defense...”

NSF Support:

- Is a primary driver of the U.S. economy.
- Enhances the nation's security.
- Advances knowledge to sustain global leadership.
NSF by the numbers

*Other than the FY 2016 figure, numbers shown are based on FY 2014 activities.*

- **$7.5 billion FY 2016 estimation**
- **94% funds research, education and related activities**
- **48,100 proposals**
- **11,900 awards funded**
- **1,883 NSF-funded Institutions**
- **362,000 NSF-supported researchers**
- **All S&E disciplines funded**
- **Funds research into STEM education**
- **214 Nobel Prize winners**
 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 Learning in Formal and Informal Settings (DRL)

Division of Graduate Education (DGE)

Division of Undergraduate Education (DUE)

Division of Human Resource Development (HRD)
DUE’s Mission:

*To promote excellence in undergraduate science, technology, engineering, and mathematics (STEM) education for all students.*

Potentially Transformative Education R&D
Division of Undergraduate Education (DUE)

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

• **IUSE (next slide)**

• **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.
IUSE: Improving Undergraduate STEM Education

• **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.

• **IUSE: HSI** (NSF 18-524)
  
  ➢ Similar to IUSE: EHR, but targeted to Hispanic-Serving Institutions.
Cross-Directorate STEM Education Programs

- Research Experiences for Undergraduates (REU: EHR; NSF 13-542)
- Faculty Early Career Development Program (CAREER: EHR; NSF 17-537)
- EHR Core Research (ECR; NSF 15-509)
- Research Coordination Networks for Undergraduate Biology Education (RCN:UBE; NSF 18-510)
- IUSE: HSI – Hispanic-Serving Institutions Program (NSF 18-524)
ATE
Advanced Technological Education
SOLICITATION: NSF 17-568
ATE Program Overview

1) ATE Focuses on the education of technicians to meet workforce demands in existing and emerging advanced technological fields.

2) Colleges that award two-year degrees and their faculty must play leadership role on all projects.

3) Requires partnerships between two-year colleges and business and industry, along with secondary schools, four-year colleges and universities, and government, as appropriate.

4) Must respond to the hiring needs of for highly-skills technical workforce in the service area of the proposing institution(s).

5) Must address sustainability.

6) Read the program solicitation for more detailed information.
S-STEM
NSF Scholarships in STEM
SOLICITATION: NSF 17-527
NSF Scholarships in STEM (S-STEM) Program

Supports institutional scholarship programs for full-time, academically-talented STEM students with demonstrated financial need.

- Scholarship Amount: Up to $10,000 per student per year (depending on financial need)
- 60% of Budget to Scholarships – 40% to Student Support, Admin., Research, Evaluation

Curricular & Co-Curricular Activities

- Curriculum
- Development
  - Professional
  - Workforce
  - Cohorts
  - Mentoring, etc.
- Study & Understand
  - Models
  - Effective practices
  - Strategies
- Recruitment
- Retention
- Student success
- Academic/career pathways
- Student transfer
- Degree attainment

Increase
S-STEM Program
Three Program Tracks

Track 1: Institutional Capacity Building
For institutions without prior funding from S-STEM or STEP programs
- Up to $650K
- Up to 5 yrs

Track 2: Design and Development: Single Institution
- Up to $1M
- Up to 5 yrs

Tracks 2 & 3 seek to leverage S-STEM funds with institutional efforts and infrastructure to increase and understand impacts

Track 3: Design and Development: Multi-Institution Consortia
- Up to $5M
- Up to 5 yrs

Deadline (All Strands and Types):
28 March 2018
Last Wednesday in March, Annually Thereafter
Management Team

Project teams composed of:

1) **Faculty member** currently teaching in one of the S-STEM disciplines
   - STEM disciplinary expertise

2) **STEM Administrator**
   - Communicate across functional units of institution

3) **A researcher** with experience in institutional, educational, discipline-based educational, or social science investigation at the institution or from another institution or research organization
   - Education, DBER, social science, change expertise
IUSE: EHR
Improving Undergraduate STEM Education
SOLICITATION: NSF 17-590
Competitive proposals should build on available evidence and theory, generate evidence, and build knowledge.

### Program Goals

<table>
<thead>
<tr>
<th>Improve STEM Learning &amp; Learning Environments:</th>
<th>Build the Professional STEM Workforce for Tomorrow:</th>
<th>Broaden Participation &amp; Institutional Capacity for STEM Learning:</th>
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<tr>
<td>• Innovative curricula</td>
<td>Improve the preparation of undergraduate students so they can succeed as productive members of the future STEM workforce, regardless of career path, and be engaged as members of a STEM-literate society</td>
<td>Increase the number and diversity of undergraduate students recruited and retained in STEM education and career pathways through improving the evidence base for successful strategies to broaden participation and implementation of the results of this research</td>
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<tr>
<td>• Improved retention</td>
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<td>• Better teaching/learning environments</td>
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<td>• Improved adoption of best practices</td>
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<td>• Better mathematical and computation skills</td>
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<td>• Improved undergraduate mentoring</td>
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<td>• Technology enhancements</td>
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IUSE: EHR Program

Two Program Tracks

Engaged Student Learning
Focus on designing, developing, and implementing research on STEM learning models, approaches, and tools

- Exploration & Design (smaller scale)
  - Up to $300K
  - Up to 3 yrs

- Development & Implementation (larger scale)
  - Level I: Up to $600K, Up to 3 yrs
  - Level II: $600K to $2M, Up to 5 yrs

Institutional and Community Transformation
Focus on increasing the propagation of highly effective methods of STEM teaching and learning

- Exploration & Design (smaller scale)
  - Up to $300K
  - Up to 3 yrs

- Development & Implementation (larger scale)
  - Up to $3M
  - Up to 5 yrs

Deadlines:
- Exploration and Design: No Deadlines
- Development and Implementation: December 11, 2018
The publication Common Guidelines for Education Research and Development offers guidance on building the evidence base in STEM learning. Research and development efforts that increase understanding of effective undergraduate STEM teaching and learning provide the foundation for building the STEM workforce of tomorrow and improving scientific literacy.
Noyce
Robert Noyce Teacher Scholarship Program

SOLICITATION: NSF 17-541
GOAL: to encourage talented STEM majors and STEM professionals to become K-12 STEM teachers

Scholarship, stipend, and fellowship recipients must teach in a high-need school district for a specified number of years

**Track 1 (S&S) Scholarships & Stipends**
Undergraduate STEM majors and/or STEM career changers

**Track 2 (TF) NSF Teaching Fellowships**
STEM career changers

**Track 3 (MTF) NSF Master Teaching Fellowships**
Exemplary, experienced STEM teachers

**Track 4 (Noyce Research) Research on the Preparation, Recruitment, and Retention of K-12 STEM Teachers**

**Deadline (All Tracks):**
Last Tuesday in August, Annually Thereafter
REU
Research Experiences for Undergraduates
SOLICITATION: NSF 13-542
REU Foci & Funding

The Research Experiences for Undergraduates program supports active research participation by undergraduate students and involve students in meaningful ways in ongoing research programs or in research projects specifically designed for REU.

There are two mechanisms for support of student research:

(1) **REU Sites** are based on independent proposals to initiate and conduct projects that engage a number of students in research.

(2) **REU Supplements** may be included as a component of proposals for new or renewal NSF grants or cooperative agreements or may be requested for ongoing NSF-funded research projects.

**BUDGET**

- For summer REU projects, the total budget request--including all direct costs and indirect costs--is generally expected not to exceed **$1,200 per student per week**.
- The budget request for an academic-year REU project should be comparable on a pro rata basis.
- Projects that involve exceptional circumstances may exceed this limit.

**Deadline:**
Fourth Wednesday in August, Annually Thereafter.
Solid REU Site Proposals

• Undergraduates in focused research projects
• Target under-represented groups
• Predominantly research, not instruction
• Focus on students from other institutions
• Target primarily students who wouldn’t otherwise have this experience
• Make your experience unique
Other Points to Consider

• Contact the Program Officer for your targeted discipline
  – Variations in expectations
  – Agreements within the community

• Talk to others with successful programs
  – Example: can’t use NSF funds to pay for social activities, but you’ll need to find a way to do them anyway
CAREER
Faculty Early Career Development Program

SOLICITATION: NSF 17-537
CAREER Foci & Funding

The Faculty Early Career Development Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations.

The **minimum** CAREER award size is $400,000 for a five-year period for EHR.


**Deadline (EHR):**
Third Wednesday in July, Annually Thereafter
ECR
EHR Core Research
SOLICITATION: NSF 15-509
ECR Foci

The EHR Core Research program of fundamental research in STEM education provides funding in critical research areas that are essential, broad and enduring. EHR seeks proposals that will help synthesize, build and/or expand research foundations in the following focal areas:

- STEM learning, STEM learning environments,
- STEM workforce development, and
- broadening participation in STEM.

The ECR program is distinguished by its emphasis on the accumulation of robust evidence to inform efforts to

- understand,
- build theory to explain, and
- suggest interventions (and innovations) to address persistent challenges in STEM interest, education, learning, and participation.

The ECR program will fund fundamental research on: human learning in STEM; learning in STEM learning environments, STEM workforce development, and research on broadening participation in STEM.
ECR Funding Levels

Funding should align with the maturity of the proposed work, the size and scope of the empirical effort, as well as the capacity of the interdisciplinary team to conduct the proposed research:

Level I proposals:
- Maximum award size: $500,000
- Maximum duration: 3 years

Level II proposals:
- Maximum award size: $1,500,000
- Maximum duration: 3 years

Level III proposals:
- Maximum award size: $2,500,000
- Maximum duration: 5 years

Deadline (All Levels):
Second Thursday in September, Annually.
IUSE: Hispanic-Serving Institutions Program (HSI Program, 18-524)

• Addresses requirements set by Congress in the Consolidated Appropriations Act, 2017 and the American Innovation and Competitiveness Act, recognizing the need to build capacity at HSIs and increase graduation rates for students pursuing associates’ and bachelors’ degrees in STEM at HSIs.

• Focuses on undergraduate STEM education at HSIs
  – https://nsf.gov/ehr/HSIProgramPlan.jsp
Eligible Institutions

• 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.
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<th>Track 1: Building Capacity</th>
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<td>$500K to $1.5M up to 5 years</td>
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<td>Critical Transitions</td>
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<td>Innovative Cross-Sector Partnerships</td>
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<td>Research on Broadening Participation in STEM</td>
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<th>Track 2: New to NSF</th>
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<td>Up to $250K for up to 3 years</td>
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<th>Resource Hub</th>
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<td>Up to $3M for up to five years</td>
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**HSI Program 18-524**

**Deadline (All Tracks):**
March 6, 2018
Ten Big Ideas

Research
• NSF INCLUDES
• Harnessing data revolution
• Future of work at the human/technology frontier
• Rules of life
• Next quantum revolution
• Navigating the New Arctic
• Multi-messenger astrophysics

Process
• Convergence research
• Midscale research infrastructure
• NSF 2026
Helpful Links

• Big Ideas:  

• Reviewer Survey (volunteer as reviewer):  
  https://www.surveymonkey.com/s/NSF_DUE_Reviewer_Info
Questions?