Inspiring STEM Learning Through Discovery and Innovation

NSF Day
October 2011
Relevant National Reports for STEM Education

- NSB - Preparing the Next Generation of STEM Innovators (2010)
- Prepare and Inspire: K-12 Education in STEM for America’s Future (2010)
- Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads (2011)
- Rising Above the Gathering Storm Revisited: Rapidly Approaching Category 5 (2010)
- Preparing Teachers, Building Evidence for Sound Policy (2010)
- Transforming American Education: Learning Powered by Technology (2010)
- Running on Empty: Failure to Teach K-12 Computer Science in the Digital Age (2010)
For 60 years the National Science Foundation has played a central role in innovation by catalyzing the development of fundamental ideas in science and engineering and supporting the people who generate them. Today, NSF is positioned to strategically stimulate innovative research that connects the science and engineering enterprise with potential economic, societal, and educational benefit.
NSF STRATEGIC GOALS: 2011-2016

- Transform the Frontiers
- Innovate for Society
- Perform as a Model Organization

Source: NSF Strategic Plan: FY 2011-2016
“Educational excellence in all of NSF’s research activities and research excellence in all of NSF’s education activities.”

—Dr. Subra Suresh
SELECTED CROSS-CUTTING PROGRAMS

- Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE)

- Faculty Early Career Development Program (CAREER)

- STEM Talent Expansion Program (STEP)

- Climate Change Education (CCE)

- Computing in the Cloud (CiC)

- Partnerships for International Research and Education (PIRE)
SELECTED CROSS-CUTTING PROGRAMS

- Science of Learning Centers (SLC)
  [Link]

- Integrative Graduate Education and Research Traineeships (IGERT)
  [Link]

- Nanotechnology in Undergraduate Education in Engineering (NUE)
  [Link]

- Research Experiences for Undergraduate (REU)
  [Link]

- Research Coordination Networks in Biological Sciences (RCN)
  [Link]

- Catalyzing New International Collaborations (CNIC)
  [Link]

- Science, Engineering, and Education for Sustainability (SEES)
  [Link]
The mission of EHR is to achieve excellence in U.S. STEM education at all levels and in all settings to support the development of a diverse and well-prepared workforce and well-informed citizenry.
EHR’S ORGANIZATIONAL STRUCTURE

Office of the Assistant Director

Division of Graduate Education (DGE)

Division of Human Resource Development (HRD)

Division of Research on Learning in Formal and Informal Settings (DRL)

Division of Undergraduate Education (DUE)
### ENGAGE, EMPOWER, AND ENERGIZE: TRANSFORMING EHR

<table>
<thead>
<tr>
<th>Three Areas of Activity</th>
<th>Description</th>
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<tbody>
<tr>
<td>Research &amp; Development Core</td>
<td>STEM research and development activities</td>
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<tr>
<td>Leadership</td>
<td>Human resource development and capacity building; strengthening the network for STEM</td>
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<tr>
<td>Expeditions</td>
<td>Exploratory, short-term work at any level from research inquiry, model building/testing to large-scale deployment; they are usually partnerships within other NSF directorates and agencies</td>
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</tbody>
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Investment Focus by Population

- PK-12 Students
- K-12 Teachers
- College Faculty
- Undergrad Students
- Graduate Students
- Public/Adults
PK-12 STUDENT POPULATION

Investment Focus by Population

Pre-K12 Students
REESE, GSE, DR K-12, ITEST, MSP, RDE, ATE, CCE

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K-12 TEACHER POPULATION

Pre-K12 Students
REESE, GSE, DR K-12, ITEST, MSP, RDE, ATE, CCE

Investment Focus by Population

K-12 Teachers
REESE, GSE, DR K-12, ITEST, MSP, ATE, RDE, ISE, TCUP, LSAMP, CCE, TSL

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COLLEGE FACULTY POPULATION

Investment Focus by Population

Pre-K12 Students
REESE, GSE, DR K-12, ITEST, MSP, RDE, ATE, CCE

K-12 Teachers
REESE, GSE, DR K-12, ITEST, MSP, ATE, RDE, ISE, TCUP, LSAMP, CCE, TSL

College Faculty
GSE, REESE, ATE, RDE, DR K-12, LSAMP, ADVANCE, AGEP, CREST, HBCU-UP, TCUP, CCE, TUES

Pre-K12 Students

K-12 Teachers

College Faculty
GRADUATE POPULATION

**Investment Focus by Population**

- **Graduate Students**
  - REESE, SFS, LSAMP, AGEP, CREST, NOYCE, S-STEM, GRFP, IGERT

- **Undergrad Students**
  - REESE, GSE, ISE, TUES, ATE, STEP, RDE, SFS, LSAMP, TCUP, HBCU-UP, NOYCE, S-STEM, CCE

- **College Faculty**
  - GSE, REESE, ATE, RDE, DR K-12, LSAMP, ADVANCE, AGEP, CREST, HBCU-UP, TCUP, CCE, TUES

- **Pre-K12 Students**
  - REESE, GSE, DR K-12, ITEST, MSP, RDE, ATE, CCE

- **K-12 Teachers**
  - REESE, GSE, DR K-12, ITEST, MSP, ATE, RDE, ISE, TCUP, LSAMP, CCE, TSL
PRESIDENTIAL AWARDS

The Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM) identifies outstanding mentoring efforts that enhance the participation and retention of underrepresented populations in STEM.

The Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) recognizes outstanding elementary and secondary teachers of mathematics and science in each state and U.S. jurisdiction.
PROPOSAL PREPARATION AND NEW REQUIREMENTS

TYPES OF FUNDING

Unsolicited Proposals
- Investigator-Initiated Project (After Conversation with Program Officer)

Program Solicitations
- Eligibility
- Goals
- Special Requirements

Dear Colleague letters
- Official Requests for Research Proposals on Specific Topics
- Often Cross-Disciplinary, Applicable to a Number of Programs
- Targeting DCL Goals is Necessary but Certainly Not Sufficient
<table>
<thead>
<tr>
<th>Types of Funding Continued</th>
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<tbody>
<tr>
<td><strong>Early-Concept Grants for Exploratory Research (EAGER)</strong></td>
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<tr>
<td>- Exploratory work on untested but potentially transformative ideas</td>
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<tr>
<td>- High-risk, high potential payoff</td>
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<tr>
<td>- $300,000 maximum; 2 years</td>
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<tr>
<td>- Eight-page description</td>
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<tr>
<td>- <em>Contact program officer first</em></td>
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<tr>
<td>- Internal review required; external optional</td>
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| **Grants for rapid Response Research (RAPID)** |
| - Research when data are ephemeral |
| - $200,000 maximum; 1 year |
| - 5 page project description |
| - Internal review required; external optional |
| - Available in all programs |
| - *Contact program officer first* |
| - Same caveats with respect to EAGER awards |
# Merit Review Criteria

## 1. Intellectual Merit
- Importance
- Qualifications
- Creativity and Originality
- Transformational
- Conception and Organization
- Access to Resources

## 2. Broader Impacts
- Training
- Diversity
- Infrastructure
- Dissemination/Public Awareness
- Societal Benefits

*Programs can also have additional review criteria*
Visiting the EHR Website

Ensuring the health and vitality of our nation's education

ABSTRACTS OF RECENT AWARDS
Proposal Development and Processing Timeline

**Proposal Preparation Time**
- **90 Days**

**Review of Proposal**
- **6 months**

**PO Recommend**

**DGA Review & Processing of Award**
- **30 days**

**Award via DGA**

**Division Director Concur**

**Decline**

**Organization**

- Minimum of three reviews required
  - Ad hoc
  - Panel
  - Both

- Returned as Inappropriate/Withdrawn

- Proposal received by NSF

**NSF Proposal Generating Document**

- Organization submits via FastLane

**Proposal Processing Unit**

- NSF Program Officer

**Research & Education Communities**

**DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES**

**NSF DAY**
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STAY CONNECTED

• Submit Proposals
• Serve as Reviewers and Panelists
• Be Active as Workshop Participants and Organizers
• Consider Being a Rotator
  http://www.nsf.gov/about/career_opps/rotators/index.jsp

For information on a particular EHR division and program, go to the EHR website and choose a division.

Contact NSF Program Directors for questions and suggestions.
USEFUL RESOURCES

- Guide to Program: [www.nsf.gov/funding/browse_all_funding.jsp](http://www.nsf.gov/funding/browse_all_funding.jsp)
- Award Information: [www.nsf.gov/awardsearch](http://www.nsf.gov/awardsearch)
- FastLane: [www.fastlane.nsf.gov](http://www.fastlane.nsf.gov)
- Funding Opportunities: [www.nsf.gov/funding](http://www.nsf.gov/funding)
THANK YOU!

Inspiring

STEM Learning
ACRONYM REFERENCE GUIDE

- **ADVANCE** Increasing Participation and Advancement of Women in Academic Science and Engineering Careers
- **AGEP** Alliances for Graduate Education and the Professoriate
- **ATE** Advanced Technological Education
- **CCE** Climate Change Education
- **CREST** Centers of Research Excellence in Science and Technology
- **DR K-12** Discovery Research K-12
- **GRFP** Graduate Research Fellowship Program
- **GSE** Research on Gender in Science and Engineering
- **HBCU-UP** Historically Black Colleges and Universities - Undergraduate Program
- **ISE** Informal Science Education
- **IEST** Innovative Technology Experiences for Students and Teachers
- **IGERT** Integrative Graduate Education and Research Traineeship
ACRONYM REFERENCE GUIDE

- **LSAMP** Louis Stokes Alliances for Minority Participation
- **MSP** Math Science Partnership
- **NOYCE** Robert Noyce Teacher Scholarships
- **PAESMEM** Presidential Awards for Mentoring
- **PAEMST** Presidential Awards for Math/Science Teaching
- **RDE** Research in Disabilities Education
- **REESE** Research and Evaluation on Education in Science and Engineering
- **S-STEM** NSF Scholarships in Science, Technology, Engineering, and Mathematics
- **STEP** Science, Technology, Engineering, and Mathematics Talent Expansion Program
- **SFS** Federal Cyber Service: Scholarship for Service
- **TCUP** Tribal Colleges and Universities Program
- **TSL** Transforming STEM Learning
- **TUES** Transforming Undergraduate Education in STEM