**Directorate for Education and Human Resources (EHR)**

**Vision:** a healthy and vital national science, technology, engineering, and mathematics (STEM) enterprise

**Mission:** to support the preparation of a diverse, globally competent STEM workforce and a STEM-literate citizenry through investment in research and development on STEM education and learning

**NSF Grants Conference**
October 6-7, 2014
Arlington, VA

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**EHR Funding Rate**

Overall FY 2013 EHR funding rate: 18%

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EHR FY2014 Strategic Framework

- Learning and Learning Environments
- Broadening Participation in STEM
- STEM Professional Workforce

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 Undergraduate Education (DUE)
- Division of Human Resource Development (HRD)
EHR Core Research (ECR) Program

- ECR supports foundational STEM education research across the Directorate.
  - Three-year investigator driven research projects
  - Annual competitions expected – *a new solicitation is expected soon.*
- EHR Core Research Areas:
  - **STEM Learning**: Research on STEM learning at all age levels, of all people, in all settings.
  - **STEM Learning Environments**: Research on learning in new and existing environments (such as personalized learning environments, virtual, on-line, blended environments, and formal and informal settings).
  - **STEM Workforce Development**: Research on preparing a diverse, globally-prepared, highly-skilled STEM workforce including academic and non-academic STEM careers.
  - **Broadening Participation in STEM and Institutional Capacity**: Research on the positive and negative factors that impact the participation, retention, and success of individuals from underrepresented groups in STEM education and careers.

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

- Advancing Informal STEM Learning (AISL)
- Discovery Research K-12 (DR-K12)
- Innovative Technology Experiences for Students and Teachers (ITEST)
- Promoting Research and Innovation in Methodologies for Evaluation (PRIME)
- STEM-C Partnerships: MSP (STEM-CP: MSP) (with DUE)
Advancing Informal STEM Learning (AISL)

- AISL seeks to advance new approaches to and evidence-based understanding of the design and development of STEM learning in informal environments; provide multiple pathways for broadening access to and engagement in STEM learning experiences; advance innovative research on and assessment of STEM learning in informal environments; and develop understandings of deeper learning by participants.

- Six types of projects:
  - Pathways – 2 years up to $300K (exploratory projects)
  - Research in Service to Practice – 2 to 5 years $300K to $2M
  - Innovations in Development – up to 5 years $500K to $3M
  - Broad Implementation – 2 to 5 years $300K to $3M
  - Conferences, Symposia, and Workshops – 2 years up to $250K
  - Science Learning + Proposals – one year planning grants $115K and partnership projects up to 5 years up to $2.4M

Discovery Research K-12 program (DRK-12)

- DRK-12 seeks to significantly enhance the learning and teaching of science, technology, engineering and mathematics (STEM) by preK-12 students and teachers, through research and development of innovative resources, models and tools (RMTs).

- Four research and development strands:
  - Assessment – development and study of assessments
  - Learning – study of RMTs to enhance student learning
  - Teaching – study of RMTs for pre- and in-service teachers
  - Implementation Research – study of previously developed RMTs

- Types of awards:
  - Exploratory up to 3 years up to $450K
  - Full Design and Development up to 4 years up to $3M
  - Conferences, Workshops, and Syntheses up to 2 years up to $100K
Information Technology Experiences for Students and Teachers (ITEST)

- The ITEST program funds foundational and applied research projects addressing the development, implementation, and dissemination of innovative strategies, tools, and models for engaging students to be aware of STEM and cognate careers, and to pursue formal school-based and informal out-of-school educational experiences to prepare for such careers.

- ITEST has two types of projects:
  - Strategies - up to 3 year projects up to $1.2M total
  - Successful Project Expansion and Dissemination (SPrEaD) – 3 to 5 year projects up to $2M total

Promoting Research and Innovation in Methodologies for Evaluation (PRIME)

- PRIME supports research on evaluation particularly:
  - Exploring innovative approaches for determining the impacts and usefulness of STEM education projects and programs;
  - Building on and expanding the theoretical foundations for evaluating STEM education and workforce development initiatives, including translating and adapting approaches from other fields; and
  - Growing the capacity and infrastructure of the evaluation field.

- Three types of proposals:
  - Exploratory Projects – 2 years up to $250K
  - Full-Scale Projects – 3 years up to $800K
  - Workshops and conferences – up to 2 years up to $100K
**STEM-C Partnerships: MSP**

- STEM-C:MSP supports Partnerships that promote effective K-12 STEM education, building knowledge of teaching and learning in ways that deepen understanding and stimulate further exploration of STEM education in both in- and out-of-school settings.
  - STEM-C Partnerships Targeted Awards:
    - Implementation – K-12 and IHE partners
    - Prototype – exploratory projects
  - STEM-C Partnerships Computer Science Education Expansion – for existing MSPs to expand to computer science

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**Division of Undergraduate Education (DUE)**

- Advanced Technological Education (ATE) (with DRL)
- Improving Undergraduate STEM Education (IUSE)
- NSF Scholarships in STEM (S-STEM)
- Robert Noyce Teacher Scholarship Program
Advanced Technological Education (ATE)

- ATE’s emphasis is on two-year colleges and focuses on the education of technicians for the high-technology fields that drive our nation’s economy.

- Institutional Projects:
  - ATE Projects: $25K to $300K per year for 3 years
  - ATE small grants: $200K per year for 3 years
  - Targeted Research on Technician Education: $150K to $800K

- ATE Centers that provide models and leadership:
  - National Centers: $4 million over four years
  - Regional Centers of Excellence: $3 million over four years
  - Support Centers: $1.6 million over four years
  - Planning Grants for Centers: $70,000

Improving Undergraduate STEM Education (IUSE)

- IUSE program goals include:
  - increasing student retention in STEM;
  - preparing students to participate in science workforce of tomorrow; and
  - improving students' STEM learning outcomes.

- Engaged Student Learning Track
  - Exploration up to $250K
  - Design and Development level I up to $600K
  - Design and Development level II $601K up to $2M

- Institutional and Community Transformation Track
  - Exploration up to $250K
  - Design and Development up to $3M
Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)

- Institutional grant to provide scholarships for academically talented and financially needy students to complete a STEM associate, baccalaureate, or graduate degree to continue to the next education level or to enter the STEM workforce.
  - Institutions select scholarship recipients (not NSF), report demographic information to NSF, and manage all aspects of the implementation of the S-STEM project.
  - Awards up to $600K over five years
  - Proposal due date ~August annually (check for a new solicitation for 2015)

Robert Noyce Scholarship Program

The goal is to encourage science, technology, engineering, and mathematics majors and professionals to become K-12 mathematics and science teachers.

- Funds go to institutions of higher education to support scholarships, stipends, and programs for students who commit to teaching in high-need K-12 schools
  - Phase I proposals provide scholarships for juniors and seniors who are majoring in a science discipline. Up to $500K for 3 to 4 years.
  - Phase II for previously funded institutions: Expand on previous project and continue evaluation or conduct longitudinal studies. Up to $500K for 3 to 4 years.
Division of Human Resource Development (HRD)

- ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers
- Alliances for Graduate Education and the Profession (AGEP)
- Historically Black Colleges and Universities Program (HBCU-UP)
- Louis Stokes Alliances for Minority Participation (LS-AMP)
- Tribal Colleges & Universities Program (TCUP)
- Centers for Research Excellence in Science and Technology (CREST)
- Excellence Awards in Science and Engineering (EASE)

ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers

Program Goal:
- To develop systemic approaches to increase the representation and advancement of women in academic STEM careers.
- To contribute to and inform the general knowledge base on gender equity in the academic STEM disciplines.

Types of Projects (in 2015-2016):
- Partnerships for Learning and Adaptation Networks: Institutions of Higher Education (PLAN:IHE)
- Partnerships for Learning and Adaptation Networks: STEM Disciplines (PLAN:D)
- Institutional Transformation Catalyst (IT-C) Projects support the evaluation of current institutional activities to identify areas for transformation and cultural change.
- Institutional Transformation (IT) Projects systemically and permanently change institutional practices to promote women in STEM academics.
Alliances for Graduate Education and the Professoriate Program (AGEP)

- The goal is to increase the number minority students receiving doctoral degrees in STEM:
  - Research and develop and implement models for recruiting, mentoring, and retaining minority students
  - Research and develop effective strategies for identifying and supporting students who want to pursue academic careers

- Research on broadening participation in graduate education:
  - undergraduate through graduate study
  - course-taking to independent research
  - the academic environment to the workplace

Centers of Research Excellence in Science and Technology (CREST)

- CREST Centers
  - Minority Serving Institutions are eligible
  - Promote the production of new knowledge
  - Increase the research productivity of faculty
  - Broaden student access to STEM research
  - Five-year projects up to $1M per year ($5M total)
  - Note that preliminary proposals are now required for CREST Centers

- Research Infrastructure for Science and Engineering (HBCU-RISE)
  - HBCUs with STEM doctoral programs only
  - Three-year projects up to $1M total
  - Broadening Participation Research in STEM Education
  - Three-year projects up to $300K total
Historically Black Colleges and Universities – Undergraduate Program

The goal is to enhance the quality of undergraduate STEM education at HBCUs.

- Implementation Projects – 4 to 5 years up to $1.75M
- ACE Implementation Projects – up to $3M for five years
- Research Initiation Award – up to $200K for 2 years
- Targeted Infusion Projects – up to $400K for 2 to 3 years
  - Short term project with a well defined measurable goal
- Broadening Participation Research – up to $350K for 3 years
  - Individual principal investigator education research projects to inform educational practice at HBCUs
- Only HBCUs with AA & BS degrees in STEM are eligible

The Louis Stokes Alliance for Minority Participation Program (LSAMP)

The goal is to develop the strategies to significantly increase the numbers of students successfully completing high quality degree programs in STEM.

- Alliance activities include:
  - student enrichment
  - skill development and academic enrichment
  - mentoring
  - curricular and instructional improvement
  - direct student support
- Types of projects:
  - Alliances - New $1M, Mid-Level $700K, Senior-Level $800K
  - Bridge to Baccalaureate (B2B) Alliances - targets community colleges $500K over 5 years
  - Bridge to the Doctorate (BD) Activity – up to $987K over 2 years
  - Broadening Participation Research (BPR) in STEM Education – up to $350K up to 3 years
Tribal Colleges and Universities Program (TCUP)

The goal is to enhance the quality of STEM instructional and outreach programs at TCUs.

- Emphasis on the leveraged use of information technologies to address the digital divide
- Activities include:
  - Implementation of comprehensive institutional approaches to strengthen STEM teaching and learning
  - Improve access to, retention within and graduation from STEM programs
- Eligible institutions are Tribal Colleges and Universities, Alaskan Native and Native Hawaiian Serving Institutions

Excellence Awards in Science and Engineering

NSF administers these programs on behalf of the White House:

- **Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST):**
  - The nation's highest honor for K-12 teachers of mathematics and science.
- **Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM):**
  - Recognizes outstanding mentoring efforts to enhance the participation of underrepresented groups in STEM.
  - Individuals, organizations, or programs can be nominated

www.nsf.gov/awards/presidential.jsp
Division of Graduate Education (DGE)

- National Science Foundation Research Traineeship (NRT) Program
- NSF Graduate Research Fellowship Program (GRFP)
- CyberCorps: Scholarships for Service (SFS)

National Science Foundation Research Traineeship (NRT) Program

- NRT supports the development of bold, new, potentially transformative, and scalable models for STEM graduate training that ensure that graduate students develop the skills, knowledge, and competencies needed to pursue a range of STEM careers.
  - New program in 2014 – additional competitions expected
  - Priority theme in 2014 – Data-Enabled Science and Engineering
  - Allows direct support of graduate students and other expenses
NSF Graduate Research Fellowship Program

- Three year graduate fellowship in fields supported by NSF (non-clinical sciences) – $32,000 stipend/year
  - Check eligibility requirements – seniors and first year graduate students are generally eligible to apply.
- Applications are usually due in October/November each year – look up the deadline which can change.
  - Institutional programs to support students to navigate the application process are encouraged
  - [www.NSFGRFP.org](http://www.NSFGRFP.org) has resources for students and reference writers

CyberCorp: Scholarship for Service (SFS)

The goal is to increase the number of students in information assurance and computer security

- Scholarship Track:
  - Funds colleges and universities to award scholarships in information assurance and computer security fields
  - After a two-year scholarship, recipients are required to work for a federal agency for two years
- Capacity Building Track:
  - Funds colleges and universities to:
    - improve quality
    - increase the production of information assurance and computer security professionals
- Related program in CISE: Secure and Trustworthy Cyberspace (SaTC)
- Office of Personal Management site: [https://www.sfs.opm.gov/](https://www.sfs.opm.gov/)
EHR Related Cross-Cutting Initiatives

• CAREER – STEM education researchers supported by EHR
  • Recognizes and supports the early career-development activities
  • Selected on the basis of creative, career-development plans that effectively integrate research and education
  • Deadline is in the summer annually

• Major Research Instrumentation (MRI)
  • $100,000 to $4 million for scientific instrumentation.
  • Proposals requesting less than $100,000 are considered from:
    • Non-Ph.D. granting organizations;
    • Mathematics, social, behavioral, or economic science
  • Proposal due date in January annually

Student & Faculty Research Opportunities

• Research Experiences for Undergraduates (REU)
  • Information for students: http://www.nsf.gov/crssprgm/reu/index.jsp
  • Information for faculty: http://www.nsf.gov/crssprgm/reu/faculty.jsp

• Research in Undergraduate Institutions (RUI) - Faculty of predominantly undergraduate institutions can get support to:
  • Perform individual and collaborative research projects
  • Purchase shared-use research instrumentation
  • Work with NSF-supported investigators at other institutions through Research Opportunity Awards (ROA)
  • http://www.nsf.gov/crssprgm/rui_roa/contacts.jsp

• Other Research Opportunities
  • Some Directorates support research experiences for K-12 teachers
  • Can be built into new proposals or supplement existing NSF awards
VISITING THE NSF WEBSITE

http://www.nsf.gov/

Use the pull down menu to quickly get to the Education main page.

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Successful K-12 STEM Education Activities

"Successful K-12 STEM Education," a report produced by the National Research Council, and funded by NSF, is a response to a request from a member of Congress, Rep. Frank Wolf, to identify the characteristics of highly successful K-12 schools and programs. The report and associated learning is available from the NSF K-12 STEM Education site.

STEAM Education Resources

NSF Announces Science Across Virtual Institutes Initiative

WIDER Dear Colleague Letter Issued

The Directorate for Education and Human Resources announces an opportunity to seek funding for "WIDER: Implementation and Demonstration of Evidence Based Reform".

Click here for more information.
Stay Connected

• Submit proposals (revise and resubmit too)
• Serve as ad hoc 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 more information on a particular EHR division and program

Contact NSF Program Officers for questions on NSF programs and activities.

Useful Resources

• NSF: www.nsf.gov
• Common Guidelines for Education Research and Development
• PAPPG: www.nsf.gov/pubs/policydocs/pappguide/nsf13001/index.jsp
• Guide to Programs:
  www.nsf.gov/funding/browse_all_funding.jsp
• Award Information: www.nsf.gov/awardsearch
• FastLane: www.fastlane.nsf.gov
• Data Management Plan: www.nsf.gov/bfa/dias/policy/dmp.jsp
• Funding Opportunities: www.nsf.gov/funding
THANK YOU

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