NSF Opportunities

Broadening Participation in STEM

Directorate for Education and Human Resources (EHR)

Today's Webinar

- Highlight EHR funding opportunities, especially those aimed at broadening participation in STEM
- Provide a forum for the field to ask Program Officers inquiries regarding funding opportunities
- Share other capacity building and professional development opportunities within EHR and across NSF

Today's Webinar

- Broadening Participation at NSF & in EHR
- Division of Human Resource Development (HRD)
- Division of Research on Learning in Formal & Informal Settings (DRL)
- Division of Undergraduate Education (DUE)
- Division of Graduate Education (DGE)
- Capacity Building & Professional Development

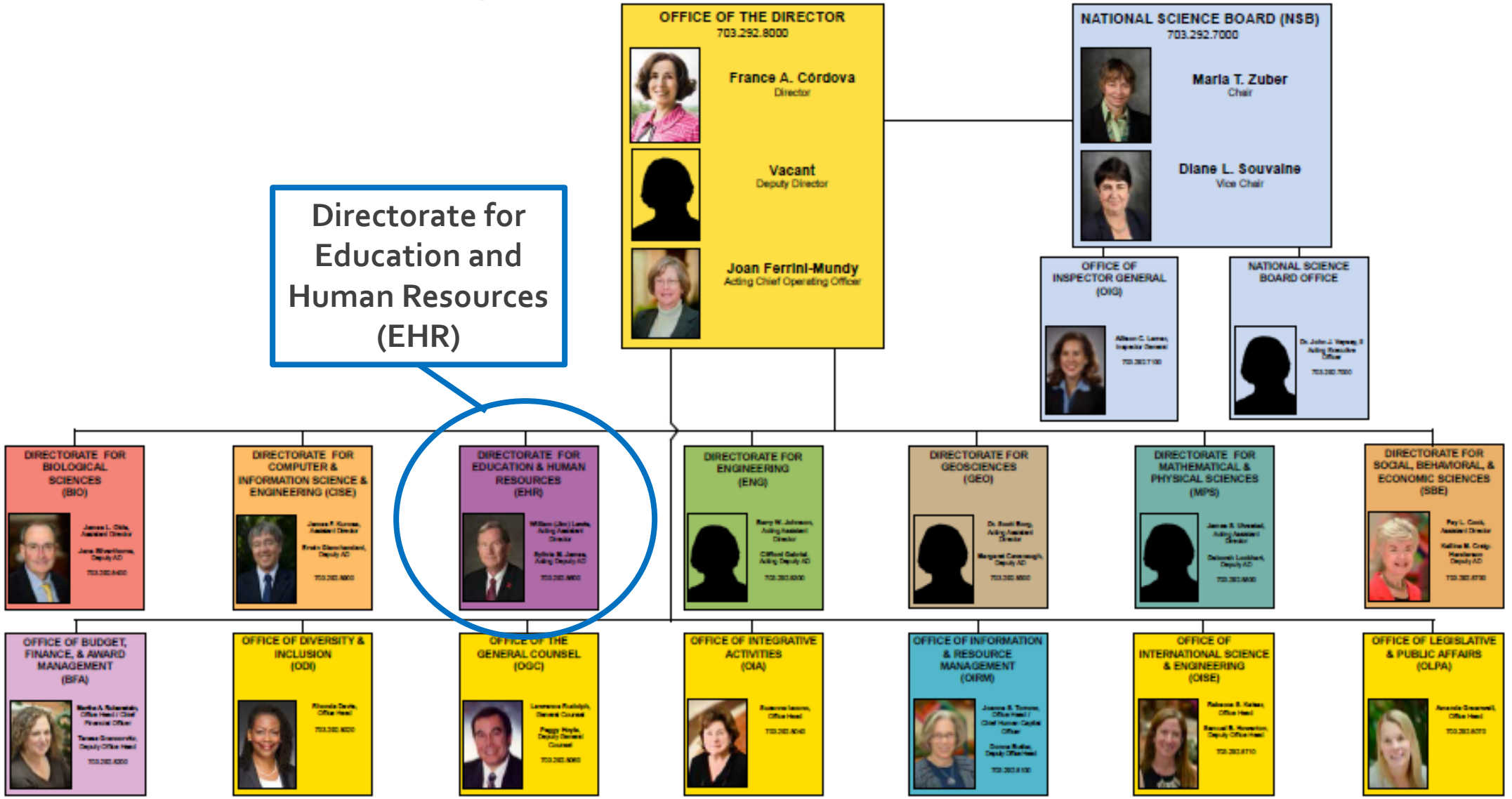
National Science Foundation

'Where discoveries are made'

"To provide an integrated strategy to advance the frontiers of knowledge, cultivate a world-class, broadly inclusive science and engineering workforce and expand the scientific literacy of all citizens, build the nation's research capability, and support excellence in science and engineering research and education."

- Established by the National Science Foundation Act of 1950.
- FY17 Annual Budget: $7.472 Billion
- NSF funds approximately 24% of all federally supported basic research conducted by colleges and universities.
- NSF supported researchers have won 217 Nobel prizes and other awards

NATIONAL SCIENCE FOUNDATION



National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230
TEL: 703.292.5111 | FIRS: 800.877.8339 | TDD: 800.281.8749

March 2017

National Science Foundation

CORE VALUES

- Scientific Excellence
- Organizational Excellence
- Learning
- **Inclusiveness**
- Accountability for Public Benefit

NSF Strategic Plan 2014 to 2018

National Science Foundation

Inclusiveness

"Seeking and embracing contributions from all sources, including underrepresented groups, regions, and institutions"

(Broadening Participation)

NSF Strategic Plan 2014 to 2018

National Science Foundation

Broadening Participation

"to expand efforts to increase participation from underrepresented groups and diverse institutions throughout the United States in all NSF activities and programs."

NSF Strategic Plan 2014 to 2018
Performance Area

National Science Foundation

Broadening Participation

- Preparing a diverse, globally engaged science, technology, engineering, and mathematics (STEM) workforce;
- Integrating research with education, and building capacity;
- Expanding efforts to broaden participation from underrepresented groups and diverse institutions across all geographical regions in all NSF activities; and
- Improving processes to recruit and select highly qualified reviewers and panelists.

NSF Strategic Plan 2014 to 2018
Investment Priorities

National Science Foundation

Broadening Participation Portfolio

The portfolio represented below is divided into three categories:

(1) programs that are primarily **focused** on broadening participation,

(2) programs that have broadening participation as one of several **emphases**, and

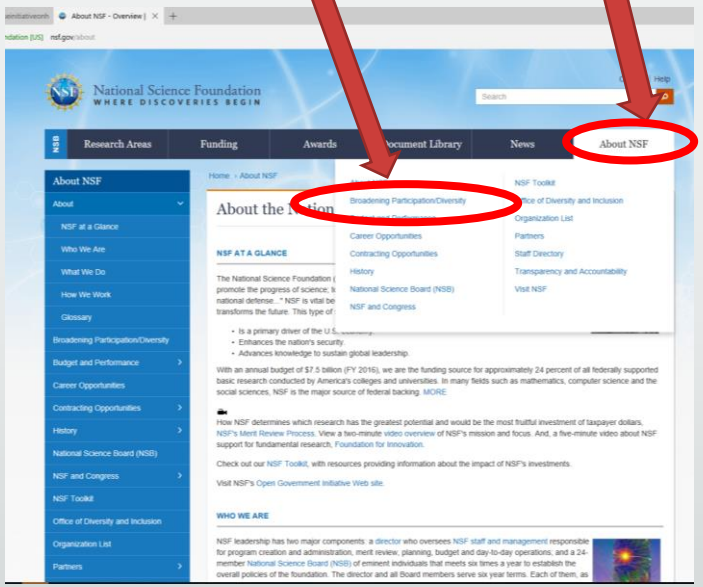
(3) **Dear Colleague Letters** expressing interest in specific aspects of broadening participation.

NSF Strategic Plan 2014 to 2018
Investment Priorities

#1 –Go to www.nsf.gov

#2 – Click on **About NSF**

#3 – Click on **Broadening Participation/Diversity**



Broadening Participation Portfolio

Background

NSF has taken a variety of approaches to broaden participation across its many programs. While broadening participation is included in the NSF review criteria, some program announcements and solicitations go beyond the standard criteria. They range from encouraging language to specific requirements. Investments range from capacity building, research centers, partnerships, and alliances to the use of co-funding or supplements to existing awards in the core research programs.

The portfolio represented below is divided into three categories: (1) programs that are primarily focused on broadening participation, (2) programs that have broadening participation as one of several emphases, and (3) Dear Colleague Letters expressing interest in specific aspects of broadening participation.

Focused Programs

Programs with an explicit broadening participation program goal. The majority of each award's budget goes to broadening participation activities, and could involve research on the topic.

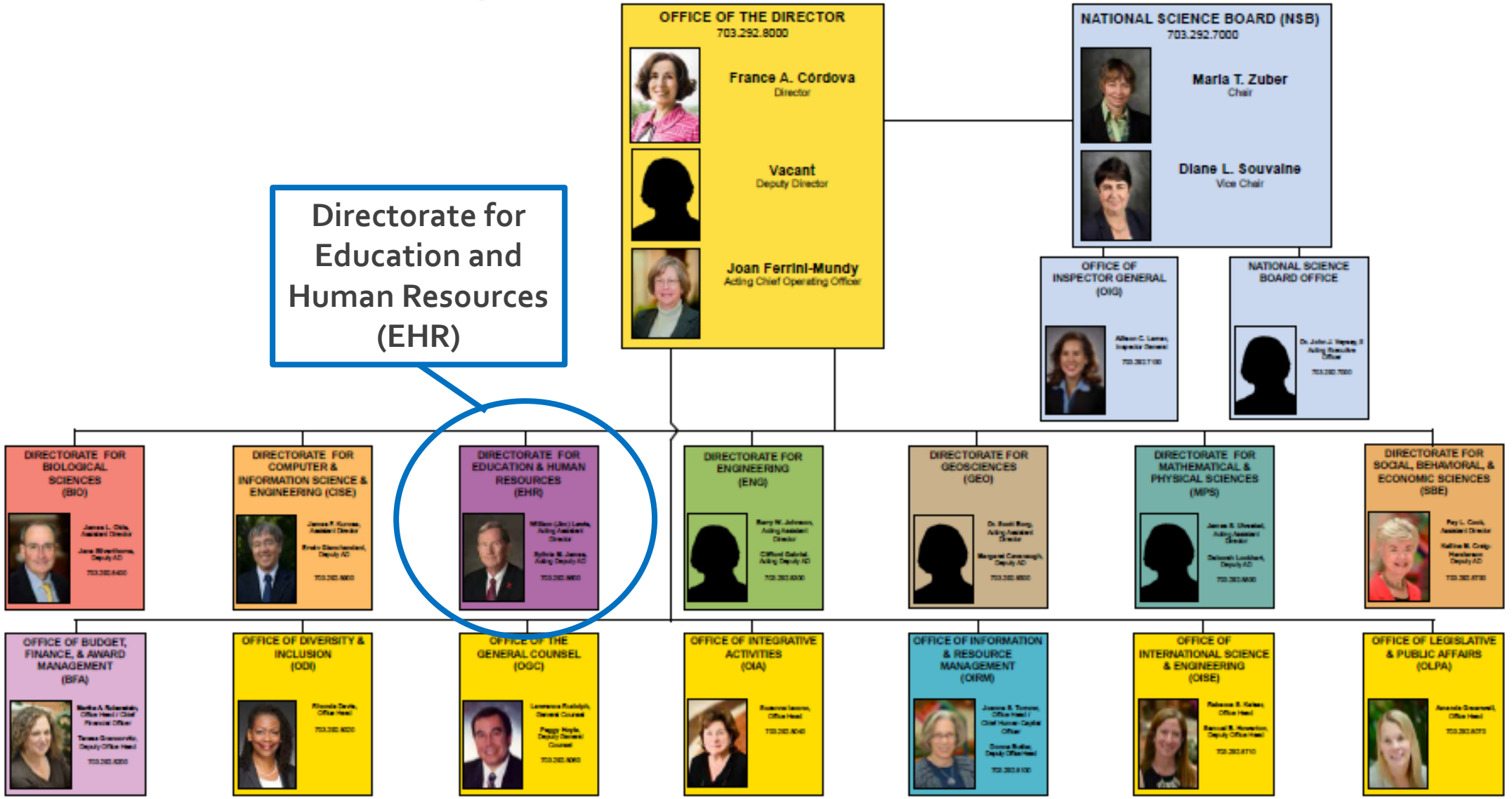
PROGRAM NAME	Publication No.	Directorate	Division
Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)	17-522	All	All
ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers	16-594	All	All
Broadening Participation in Engineering	16-7680	ENG	EEC
Centers of Research Excellence in Science and Technology (CREST) and HBCU Research Infrastructure for Science and Engineering (RISE)	16-525	EHR, ENG	HRD
Disability and Rehabilitation Engineering	17-5342	ENG	CBET
EPSCoR Research Infrastructure Improvement Program Track-3: Building Diverse Communities	13-553	OIA	
Experimental Program to Stimulate Competitive Research: Workshop Opportunities (EPS-WO)	12-588	All	All
Historically Black Colleges and Universities Undergraduate Program	16-538	EHR	HRD

Directorate for Education and Human Resources (EHR)

Mission

To achieve excellence in U.S. **science, technology, engineering and mathematics (STEM) education** at all levels and in all settings (both formal and informal) in order to support the development of a diverse and well-prepared workforce of scientists, technicians, engineers, mathematicians and educators and a well-informed citizenry that have access to the ideas and tools of science and engineering.

NATIONAL SCIENCE FOUNDATION



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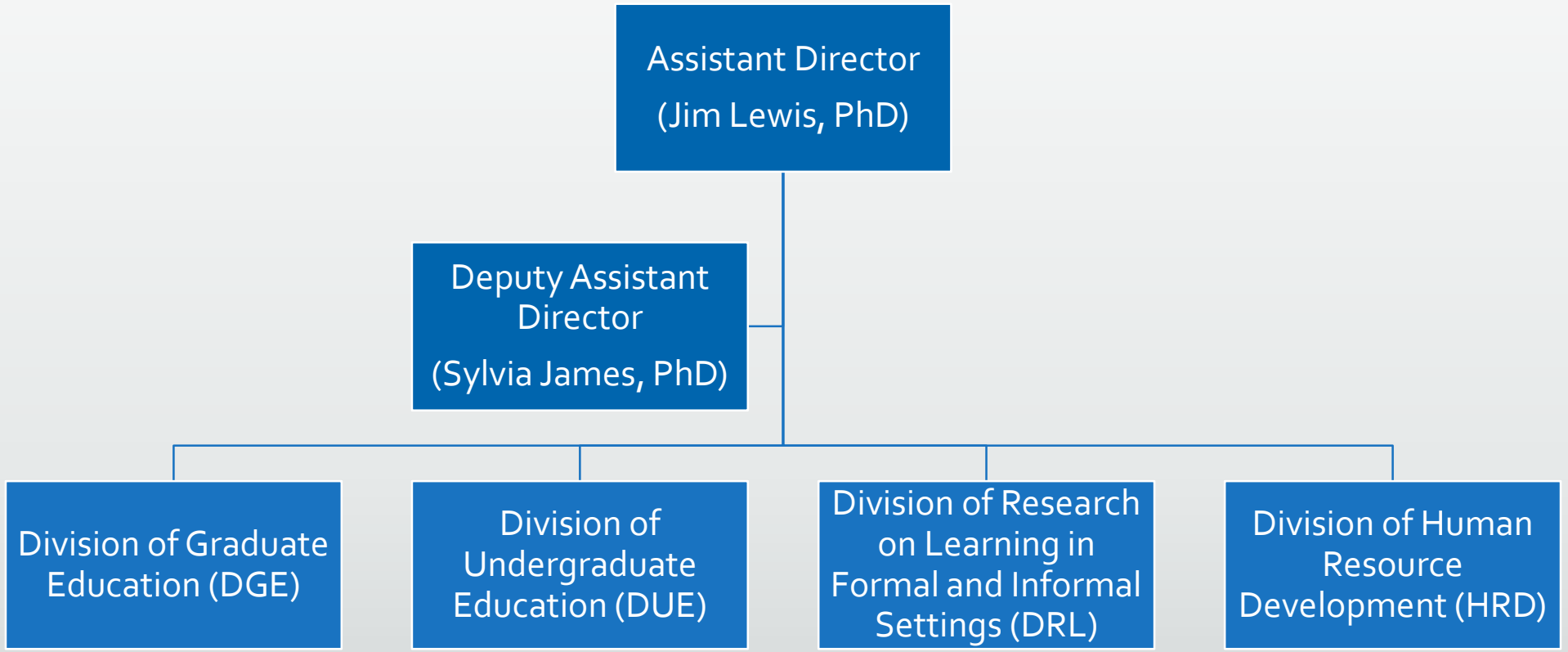
March 2017

EHR Organization Chart



Directorate for Education and Human Resources (EHR)

Research and Investment Themes

- Learning and Learning Environments
- **Broadening Participation and Institutional Capacity in STEM**
- STEM Workforce

EHR Strategic Framework

Directorate for Education and Human Resources (EHR)

Broadening Participation and Institutional Support

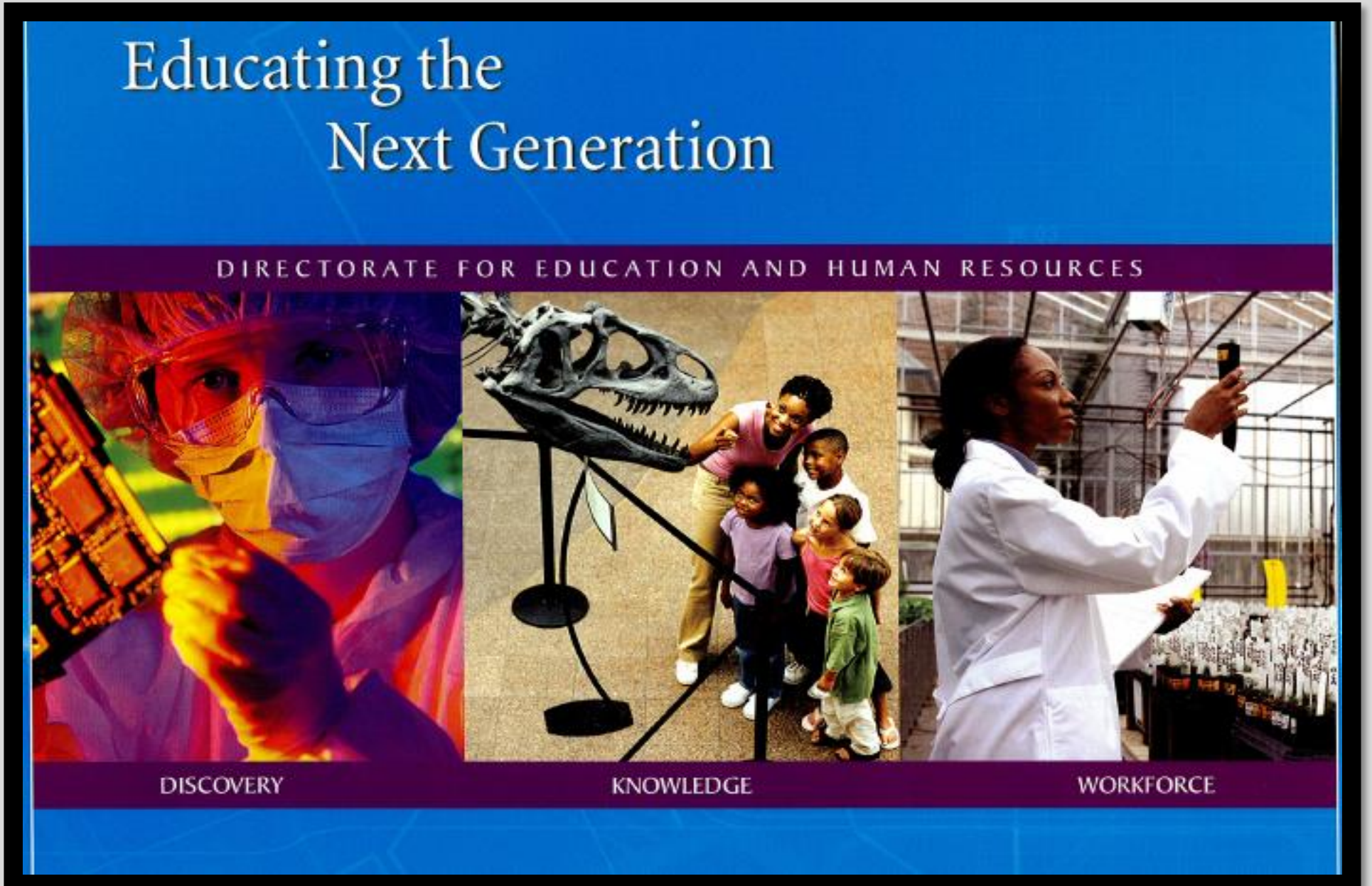
Programs in this category capitalize on the Nation's **diversity** in order to increase the scientific workforce by engaging and building capacity in **all people** in **STEM learning and professional training, particularly those from groups that have been traditionally underrepresented** in STEM fields.

Division of Human Resource Development (HRD)

Directorate for Education and Human Resources

Presenters: Marilyn Suiter, PhD, Sharon Bird, PhD, and Jim Colby, PhD

NSF Directorate for Education and Human Resources (EHR)
Division of Human Resource Development (HRD)

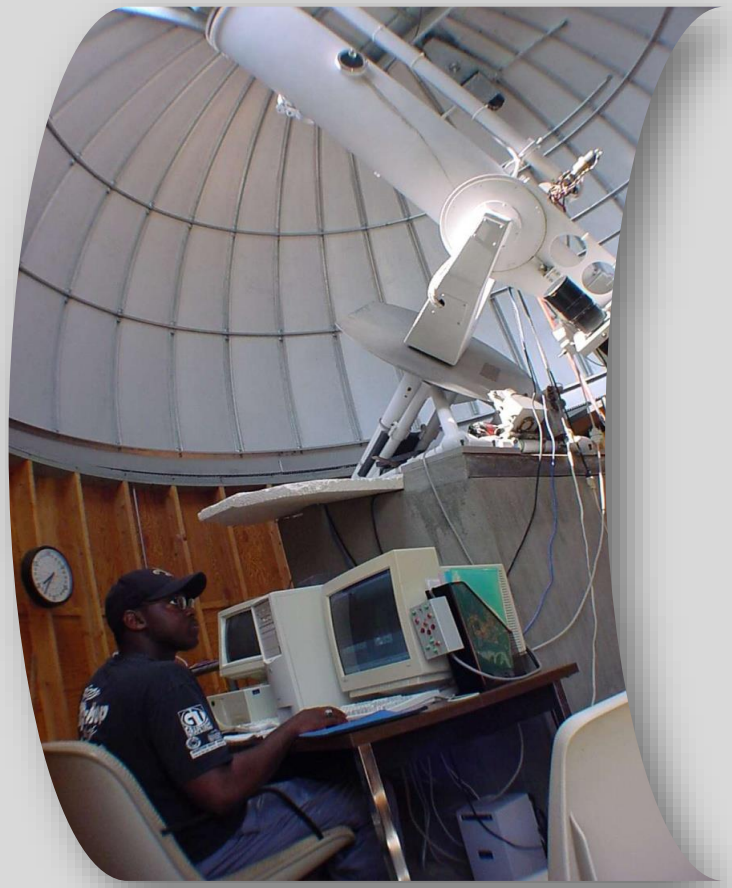


NSF Strategic Plan 2014 to 2018

Core Values

- Scientific Excellence
- Organizational Excellence
- Learning
- **Inclusiveness**
- Accountability for Public Benefit

NSF Division of Human Resource Development Strategic Plan *Mission Statement*



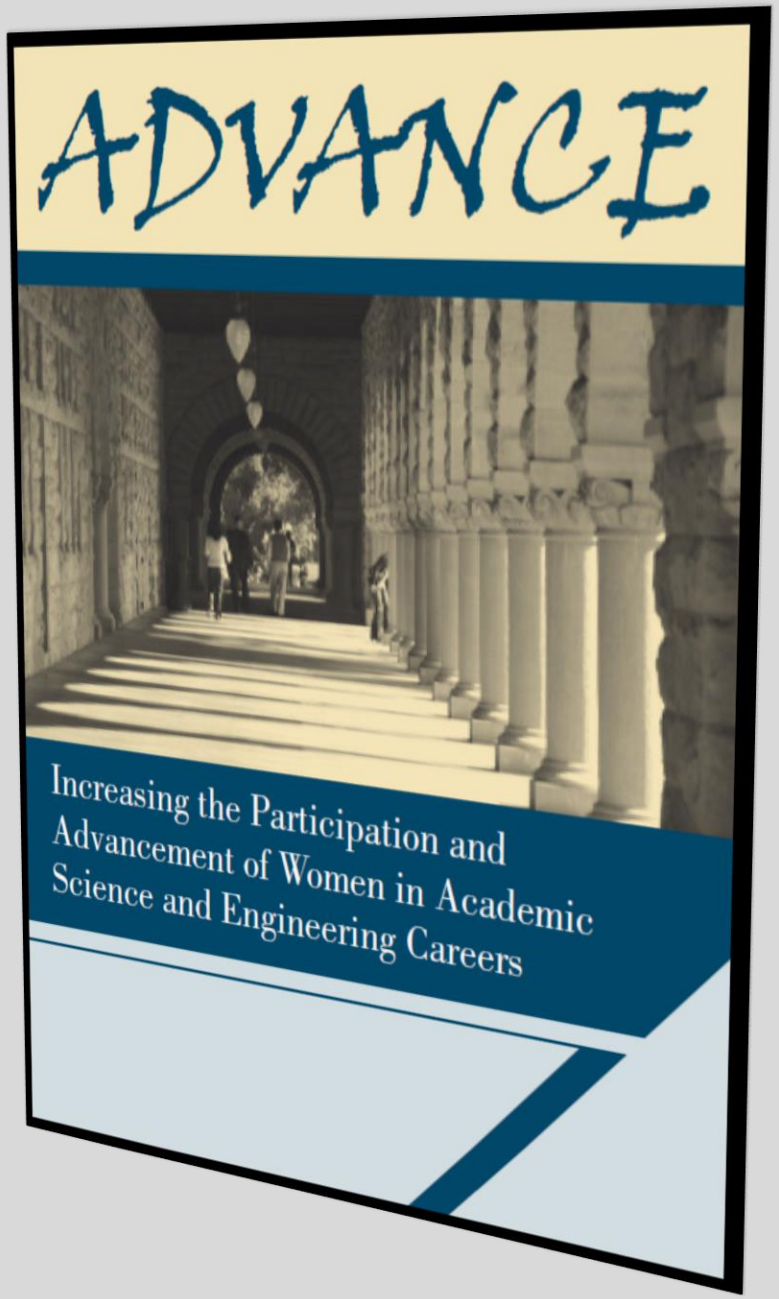
NSF-supported Prairie View A&M Graduate Student

The Division mission is to grow the innovative and competitive U.S. STEM workforce that is vital for sustaining and advancing the Nation's prosperity by supporting the broader participation and success of individuals currently underrepresented in STEM and the institutions that serve them.

Generally, HRD programmatic portfolio seeks to…

- Promote institutional transformation and capacity building such that faculty may advance the delivery of quality STEM education and teaching for individuals from groups historically underrepresented in STEM fields;
- Support for students, undergraduate through doctoral training;
- Develop teacher leadership among K-12 teachers from groups underrepresented in our schools; and
- Cultivate a fundamental base of knowledge that enlarges our understanding of broadened participation and how that contributes to careers and civic engagement.

The **ADVANCE** program is designed to foster gender equity through a focus on the identification and elimination of organizational barriers that impede the full participation and advancement of all women faculty in academic institutions. Organizational barriers that inhibit equity may exist in policy, practice, culture, and organizational climate.



Program Announcement via:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383&org=HRD&from=home

Alliances for Graduate Education and the Professoriate (AGEP)

AGEP-Brookhaven National Laboratory project Faculty, post-docs, graduate students, administrators.

AGEP seeks to advance knowledge about models to improve pathways to the professoriate for historically underrepresented minority doctoral students (including those with disabilities), postdoctoral fellows and faculty in specific STEM disciplines and/or STEM education research fields.

New and innovative models are encouraged, as are models that reproduce and/or replicate existing evidence-based alliances in significantly different disciplines, institutions, and participant cohorts.

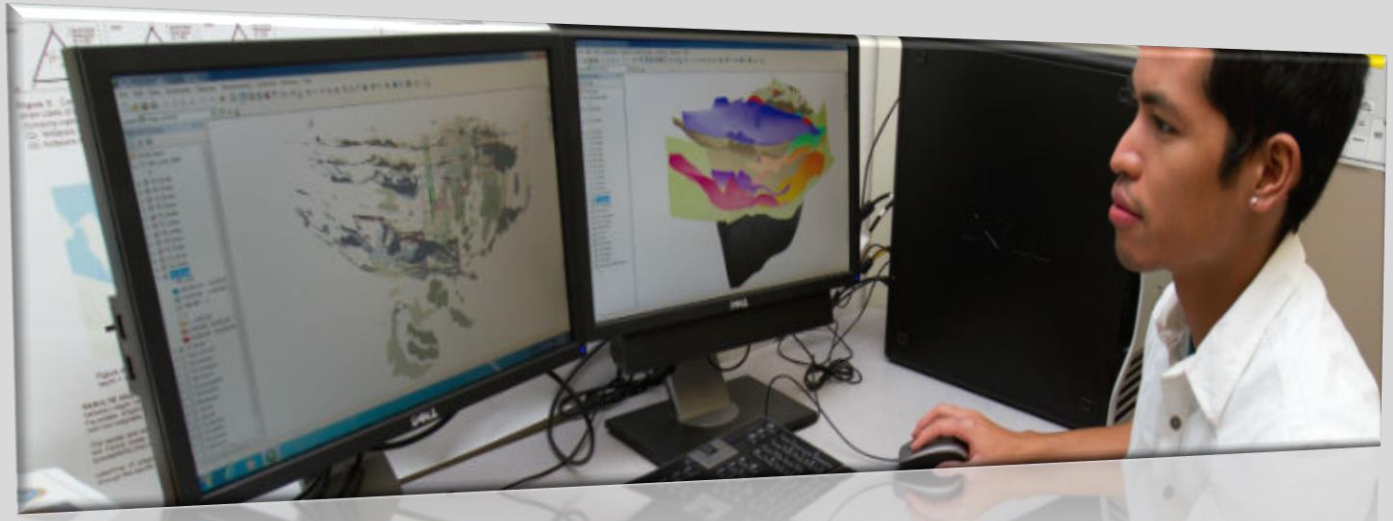
Program Announcement via:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5474&org=HRD&from=home

Centers of Research Excellence in Science and technology (CREST)

Program Announcement via:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6668&org=HRD&from=home

The **CREST** program provides support to enhance the research capabilities of minority-serving institutions through the establishment of centers with collaborating partners that effectively integrate education and research.

Projects must demonstrate a compelling vision for research infrastructure improvement, and a comprehensive to achieve and sustain national competitiveness in a clearly defined area of national significance in science or engineering research.



CREST project – California State University, Bakersfield For the study of 21st century water resources and subsurface carbon storage in the San Joaquin Valley.

Historically Black Colleges & Universities Undergraduate Program (HBCU-UP)

HBCU-UP seeks to meet the nation's accelerating demands for STEM talent, and more rapid gains in achievement and successful degree completion in STEM for underrepresented minority populations.

Awards support development, implementation, and the study of evidence-based, innovative models and approaches to nourish substantial improvements in the preparation and STEM workforce career success of HBCU undergraduates.

Program Announcement via:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5481&org=HRD&from=home

Louis Stokes Alliances for Minority Participation (LSAMP)

LSAMP was authorized by Congress and established in 1991. The LSAMP program provides funding to alliances that implement comprehensive, evidence-based, innovative, and sustained strategies that ultimately result in the graduation of well-prepared, highly-qualified students from underrepresented groups who pursue graduate studies or careers in STEM.

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Program Announcement via:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13646&org=HRD&from=home

Tribal Colleges and Universities Program (TCUP)

TCUP provides awards to Tribal Colleges and Universities, Alaska Native-serving institutions, and Native Hawaiian-serving institutions to promote high quality STEM education and research in order to support the preparation of a science and engineering workforce that is broadly inclusive and capable of performing in an international research and development environment in order for the U.S. to remain at the forefront of world science and technology.

Program Announcement via:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5483&org=HRD&from=home

NSF Excellence Awards in Science & Engineering

Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST)

Program Information via:
https://www.paemst.org/

Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM)

Program Announcement via:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5473&org=HRD&from=home

NSF *INCLUDES*

Inclusion across the Nation of Learners of Underrepresented Discoverers in Engineering and Science

Program Announcement via:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505289

National Science Foundation
WHERE DISCOVERIES BEGIN

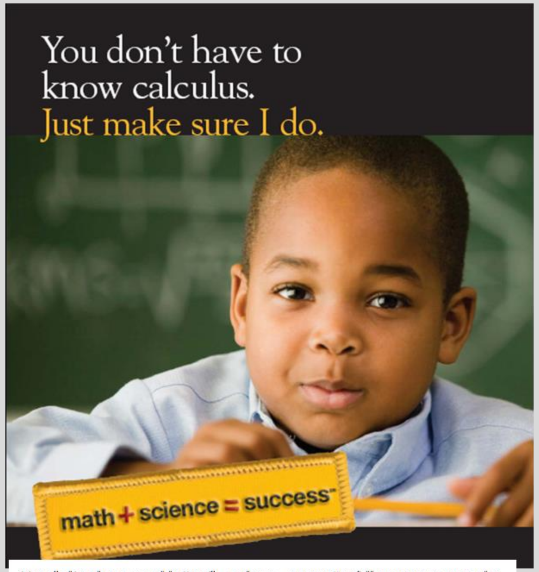
NSF 16-094

Dear Colleague Letter: Strengthening Transfer of Students from Two-year Hispanic-serving Institutions to Four-year STEM Programs

June 2, 2016

- NSF is interested in support for the successful transfer of students (particularly minority students) from two-year Hispanic-serving institutions into four-year institutions of their choice in order to pursue STEM baccalaureate degrees.
- Two-year HSIs are particularly encouraged to submit proposals and four-year institutions are strongly encouraged to partner with a two-year HSI.
- NSF programs receiving these proposals are:
  - Louis Stokes Alliances for Minority Participation
  - NSF Scholarships in Science, Technology, Engineering, and Mathematics
  - Proposals for conferences and workshops are also welcomed to any program relevant to the proposed activity.

THANK YOU!



Bus shelter signage used in "math + science = success" public awareness campaign.
Credit: Manpower Incorporated, Atlanta, GA.

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

Directorate for Education and Human Resources

Presenters: Monya Ruffin, PhD and Bob Russell, PhD

NSF INCLUDES

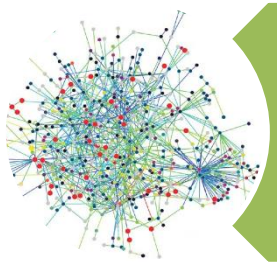
Enhancing Science and Engineering through Diversity

What is NSF INCLUDES?

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)

A comprehensive national, NSF-wide initiative aimed at catalyzing new approaches to broadening participation in STEM by incentivizing the building of collaborative infrastructures that will bring people and organizations together who might currently be working in isolation.

NSF INCLUDES Objectives



Bring together dedicated partners

Find approaches that work

Build a nation where everyone has opportunities in STEM

NSF INCLUDES Three Essential Components

a multi-stage, multi-year initiative

Design and Development launch Pilots

- Plan activities and lay the foundations for potential partners
- Share common goals and purposes through collective impact-style approaches.

Alliances

- Build on the activities of launch pilots
- Add new partners, collaborators, or networks.
- Each alliance will have its own local communication (backbone) organization.

Coordination Hub

- Provide increased communications, interoperability, coordination, support, and accountability for the network of NSF INCLUDES alliances.
- Drive overarching vision and strategy, align common activities, establish shared measurement practices, build public will, advance policy, and mobilize funding across the network.

NSF INCLUDES Collaborative Infrastructure

Vision	• Engage the community in a shared vision
Partnership	• Provide a platform for collaborative action
Goals and metrics	• Allow for evidence-based decision making
Leadership and communication	• Increase communication and visibility
Potential for expansion, impact and scale	• Establish the capacity for expansion, sustainability and scale.

Social Innovation

Theories of Action

- Collective Impact
- Networked Improvement Communities
- Others

NSF INCLUDES

See Future Solicitations, Dear Colleague Letters, etc.

LifeSTEM

Congressional Mandate

Dear Colleague Letter (DCL) NSF 16-143

"DCL clarifies or amends an existing policy or document, announce special competitions, or draw attention to impending changes…."

LifeSTEM DCL NSF 16-143

- The goal of the LifeSTEM initiative is to:
  - **Place more emphasis on the life sciences and biosciences**
  - Increase participation and retention of minority students in STEM fields
  - Target K-12 and/or undergraduate students
  - Promote partnerships with K-12 schools in formal or informal settings.
  - **Use research to create, implement, disseminate and evaluate effective models of intervention**

LifeSTEM: Areas of science dealing with the study of living organisms relative to their life processes and interrelationships.

Life Science

- Biology
- Botany
- Zoology
- Microbiology
- Physiology
- Biochemistry
- Cognitive neuroscience and evolutionary psychology
  - and related sub-disciplines and subjects.

Bioscience

- Biotechnology
- Biochemistry
- Biodiversity
- Biophysics
- Cell biology
- Genetics
- Botany
  - and related subdivisions and topics

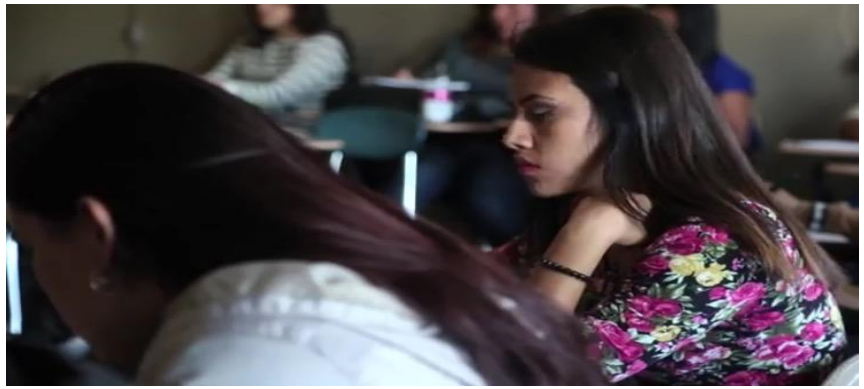
Six Participating Programs

- Discovery Research PreK-12 (DR PreK-12)
- Innovative Technology Experiences for Teachers and Students (ITEST)
- Education Core Research (ECR)
- Advancing Informal STEM Learning (AISL)
- Improving Undergraduate STEM Education: Education and Human Resources (IUSE)
- Historically Black Colleges and Universities—Undergraduate Program (HBCU-UP)

See Individual Program Solicitations for Proposal Deadlines

Division of Research on Learning in Informal & Formal Settings

- Innovative Technology Experiences for Teachers & Students (ITEST)
- Advancing Informal STEM Learning (AISL)
- Discovery Research PreK-12 (DR PreK-12)
- EHR Core Research (ECR)



Innovative Technology Experiences for Students and Teachers (ITEST)

ITEST Program Overview

- ITEST promotes PreK-12 student interest and involvement in STEM and related careers

- ITEST supports innovative strategies that:
  - Increase student awareness of STEM and ICT careers.
  - Motivate students to pursue the education necessary to participate in those careers.
  - Provide students with technology-rich experiences that develop their knowledge of related content and skills needed for entering the STEM workforce.
  - **Broaden participation**

ITEST Solicitation (17-565)

Anticipated ITEST Program Funding Amount: $10,000,000 - $20,000,000

ITEST Per Project Funding Amount: up to $2,000,000

- Three project types: Exploratory, Strategies, & SPREAD
- Funded through H1-B Work Visa Revenue
- **Additional Solicitation Specific Criteria related to broadening participation for all ITEST proposals.**
- **Proposal Deadline: September 5, 2017**
- Resource Center: STELAR, www.stelar.edu.org

Advancing Informal STEM Learning (AISL)

Photo Source: Pacific Science Center & CENTC, ISE/AISL Supplement

AISL Program Overview

- **Advances new *approaches to and understanding of* the design and development of STEM learning in informal environments for public and professional audiences.**
- **Investments should be of interest and utility to public audiences, informal STEM practitioners, and decision-makers.**
- **Priorities: knowledge-building, innovation, strategic impact, and collaboration.**

AISL Solicitation (15- 593)

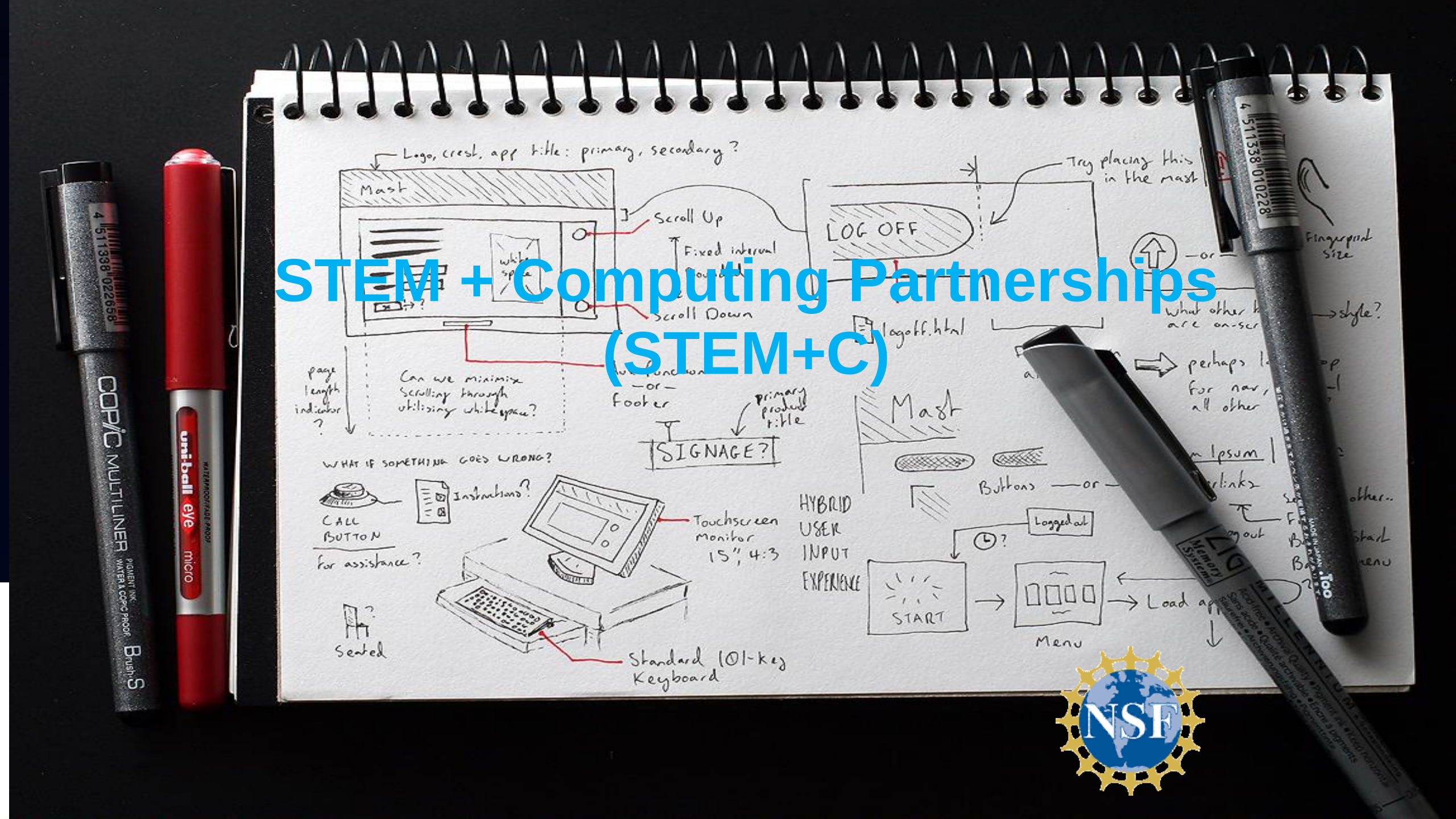
- **Supports Several Project Types: from Exploratory Pathways to Broad Implementation projects; Science Learning + (ed. research partnerships with UK orgs.); conferences/workshops;**

- **Additional Solicitation Specific Criteria for projects that include a goal of broadening participation.**

- **Proposal Deadline: November 2017 (est., new solicitation out soon)**

- **Resource Center: Center for Advancement of Informal Science Education (CAISE), www.informalscience.org**

Anticipated ASL Program Funding Amount: $28,000,000 to $38,000,000
Estimated AISL Per Project Funding Amount: $50,000 - $3,000,000



STEM + Computing Partnerships (STEM+C)

Discovery Research PreK-12 (DRK-12)

Discovery Research PreK-12 (DRK-12) Program Overview

- DRK-12 supports integrated Research and Development of Resources, Models , and Tools in the service of STEM learning and learning environments

- Goals: enhanced student achievement in STEM, preparation for the scientific workforce, and improved science literacy

- Focus: learning that takes place during the 12-14 years students are enrolled in the formal classroom learning environment

Discovery Research PreK-12 Solicitation (15-592)

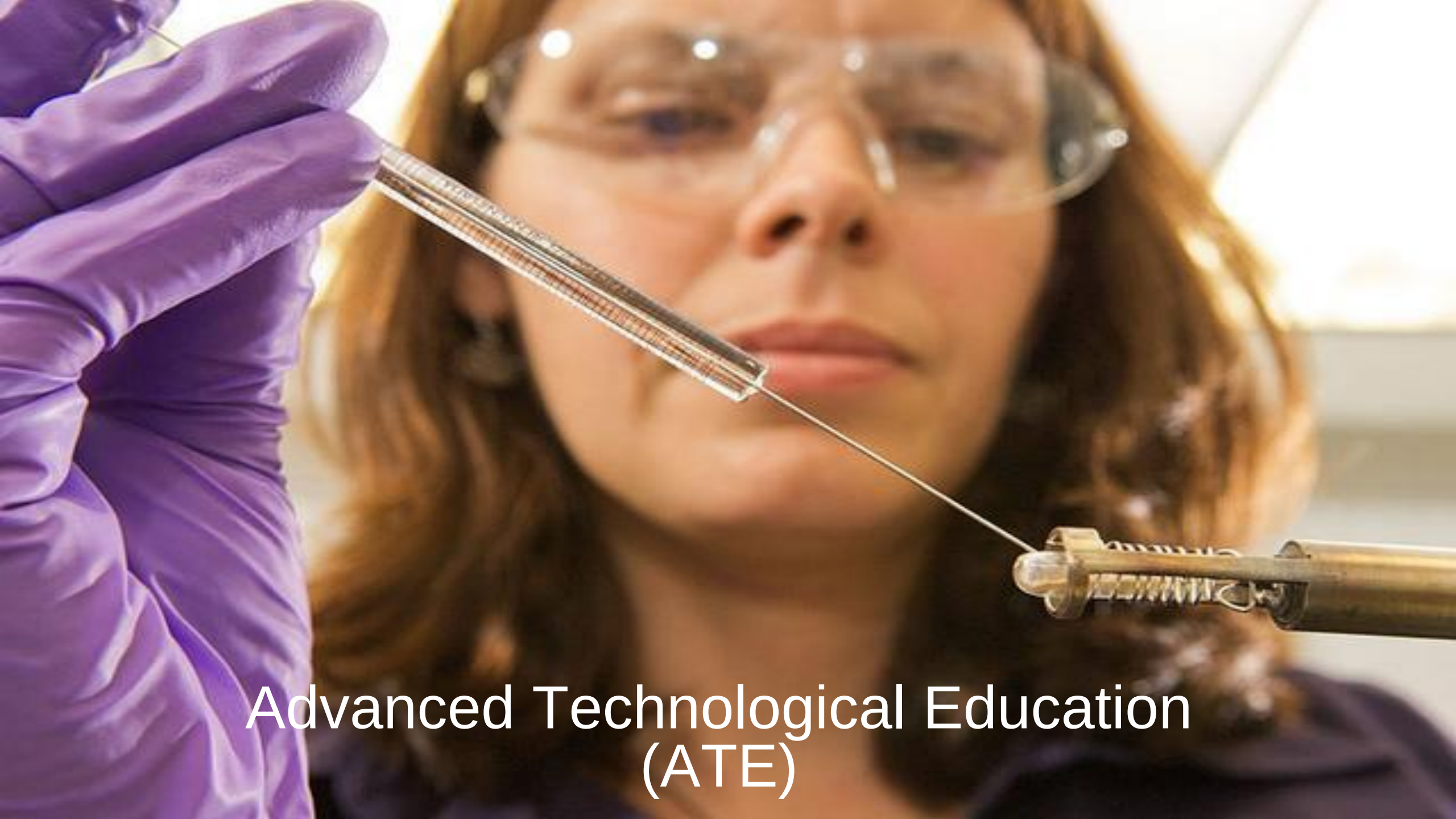
- DRK-12 has three major research and development strands: Assessment; Learning; Teaching

- **Proposal ~~Deadline:~~ Deadline: Dec. 2017**
  (estimated, new solicitation out soon)

- Resource Center: Cadre, www.cadrek12.org

Anticipated DRK-12 Program Funding Amount: $50,000,000

Estimated DRK-12 Per Project Funding Amount: $450,000 - $5,000,000



Advanced Technological Education (ATE)

Advanced Technological Education (ATE) Program Overview

- ATE has an emphasizes on two-year colleges and secondary school levels.
- Focuses on the education of high-technology technicians.
- Involves partnerships between academia and industry.
- Supports:
  - Curriculum development
  - Professional development of college faculty and secondary school teachers
  - Career pathways to tow-year colleges and four-year institutions
  - Emphasis on broadening participation

Choosing the Appropriate Program

Where is the “intellectual center of gravity” of your project?

- Foundational learning research (ECR)
- Resources, Models, & Tools (DRK-12)
- Informal STEM learning (AISL)
- Workforce development in STEM for youth & teachers (ITEST)
- Partnerships with schools and others (STEM+C)

Contact Program Officers About Your Project

- Examine the websites of the relevant programs
- Prepare a 1-2 -page summary of your project
- Address the merit review criteria
- Contact one of the listed Program Directors with questions about relevance of your project
- Not required but program officers can give you excellent feedback
- Link to info about all EHR programs: https://www.nsf.gov/funding/programs.jsp?org=EHR

Division of Undergraduate Education (DUE)

Directorate for Education and Human Resources

Presenters: Tom Higgins, PhD, and Karen Crosby, PhD

Representing DUE Programs Today:

Karen Crosby
kcrosby@nsf.gov

Thomas Higgins
thhiggins@nsf.gov

Program Directors
Division of Undergraduate Education (DUE)/
Education and Human Resources Directorate (EHR)

DUE's Mission:

To promote excellence in undergraduate science, technology, engineering, and mathematics (STEM) education for <u>all</u> <u>students</u>.

Potentially Transformative Education R&D

Transformative Projects

- Transformative activity involves ideas, discoveries, or tools that **radically change our understanding** of an important existing scientific or engineering concept or educational practice or leads to the **creation of a new paradigm or field** of science, engineering, or education. Such research challenges current understanding or provides pathways to new frontiers.
- Transformative activity results often do not fit within established models or theories and may initially be unexpected or difficult to interpret; their transformative nature and utility **might not be recognized until years later**.

Transformative Activity		
Challenges conventional wisdom	Leads to unexpected insights that enable new techniques or methodologies	Redefines the boundaries of science, engineering, or education

Selected STEM Education Programs

- **DUE Programs**
  - Advanced Technological Education (ATE)
  - Robert Noyce Teacher Scholarship Program (Noyce)
  - Improving Undergraduate STEM Education (IUSE:EHR)
  - Scholarships in Science, Technology, Engineering, and Mathematics Education (S-STEM)

NSF 17-568

Advanced Technological Education (ATE) Program

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.

National Science Foundation
Division of Undergraduate Education (DUE)

ATE Program

Three Program Tracks

ATE Projects

Up to $600k, up to 3 yrs

except

Small/New to ATE:

Up to $225k

ATE Centers

Two Types

National

Up to $5M

5 yrs

Resource Centers

Up to $600k

3 yrs

Targeted Research in Technician Education

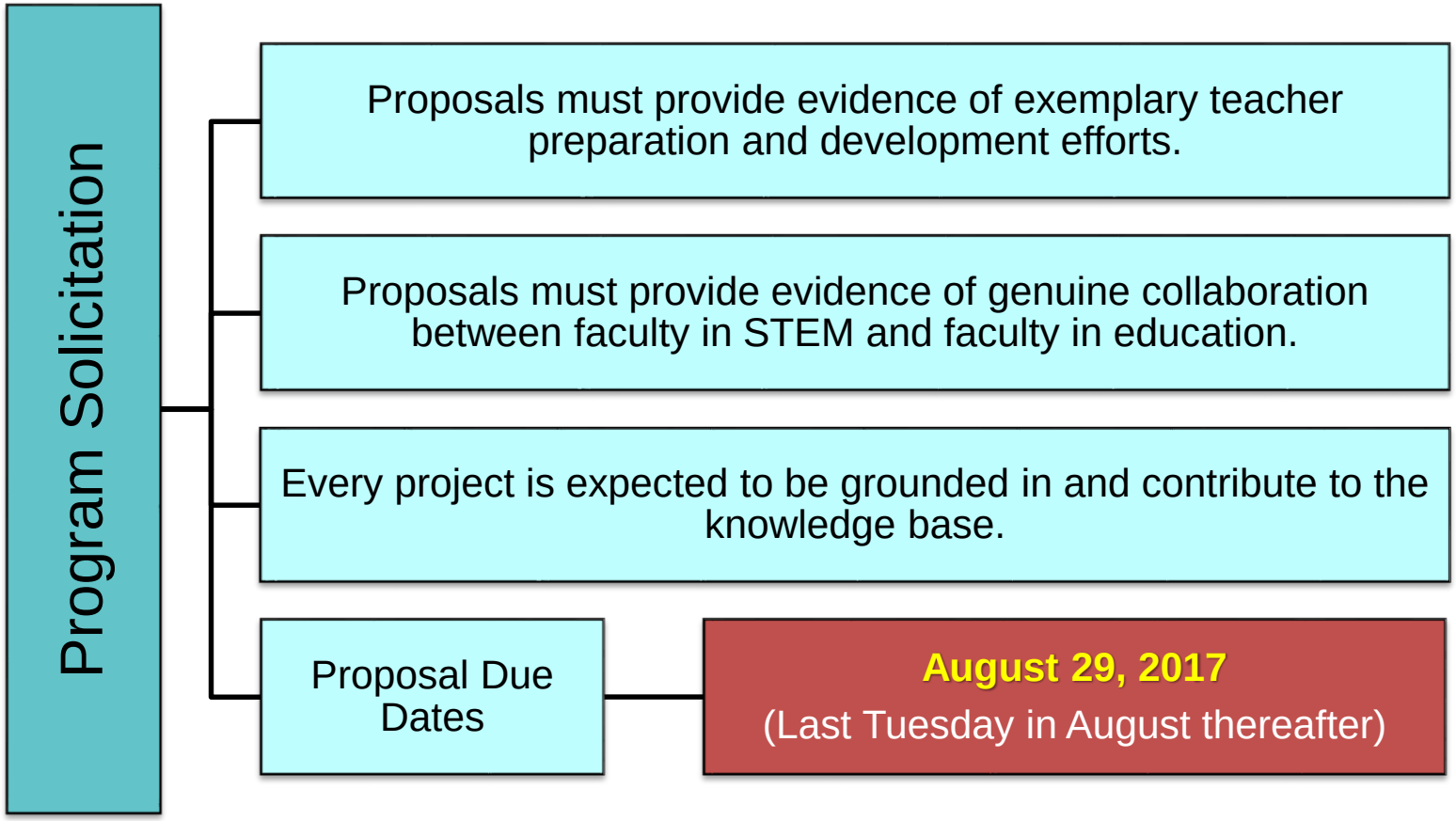
From $150k, up to 2 yrs
to $800k, up to 3 yrs

Deadlines (All Tracks):
5 October 2017

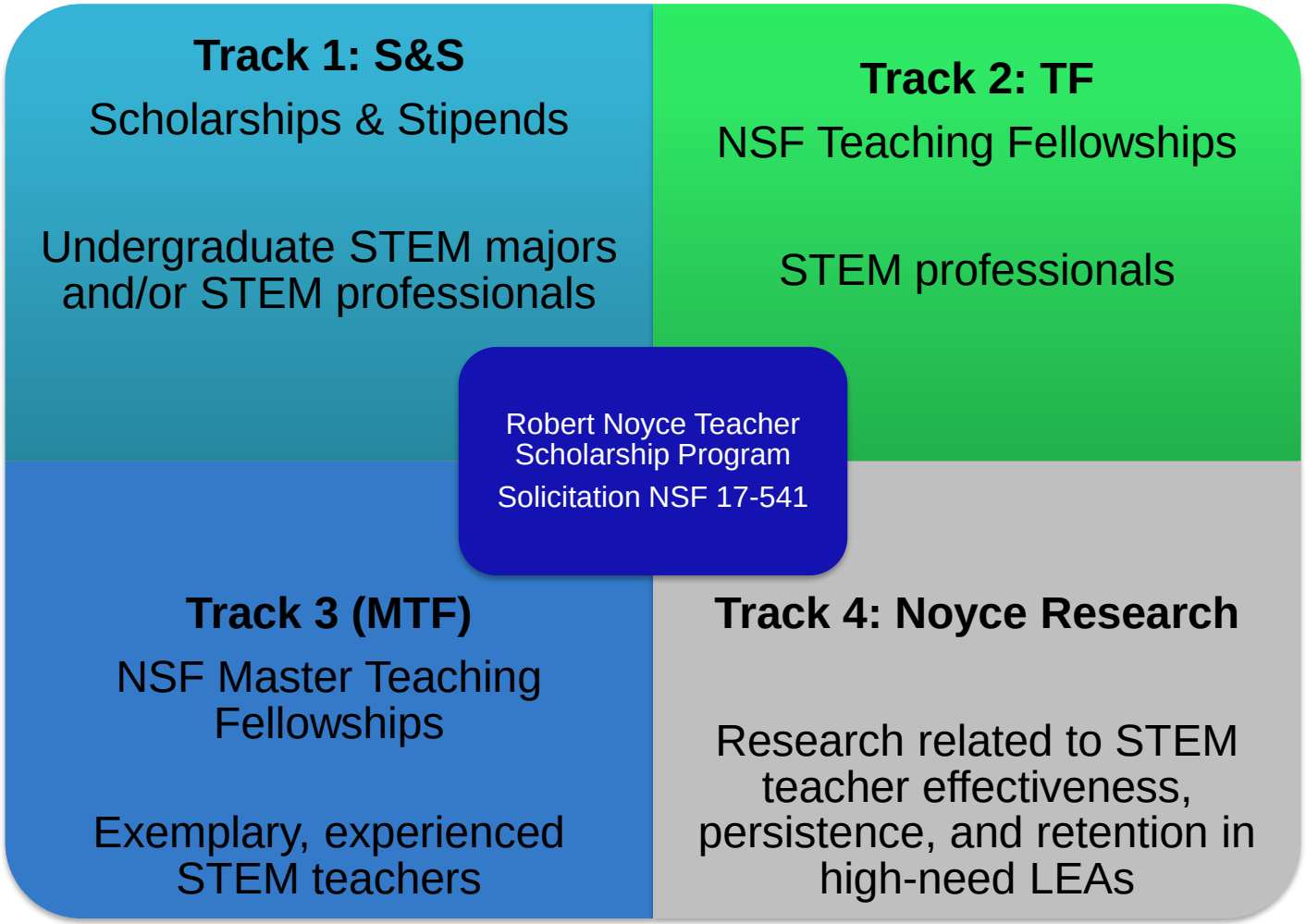
National Science Foundation
Division of Undergraduate Education (DUE)

NSF 17-541

Robert Noyce Teacher Scholarship Program



Robert Noyce Teacher Scholarship Program



*Capacity Building projects, which may lead to the development of full proposals for Tracks 1, 2, or 3, are also supported.

National Science Foundation
Division of Undergraduate Education (DUE)

NSF 15-585

Improving Undergraduate STEM Education (IUSE: EHR)

Improve STEM Learning & Learning Environments

Build the Professional STEM Workforce for Tomorrow

Broaden Participation & Institutional Capacity for STEM Learning

Proposals should describe projects that build on available evidence and theory, and that will generate evidence and build knowledge.

National Science Foundation
Division of Undergraduate Education (DUE)

IUSE: EHR Program

Broaden Participation & Institutional Capacity for STEM Learning:

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

#1505007 – Collaborative Research: Liberal Studies in Engineering - Broadening the Path to the Profession: Feasibility Study

"…develop a framework for establishing an undergraduate, pre-professional, Bachelor of Arts degree program called Liberal Studies in Engineering. **This program intends to establish an alternative pathway into engineering and attract the interest of a different group of students** than existing approaches."

"The outcomes of this project are not only of interest to the power electronics education community, but they also pave the road for developing similar tools for other multidisciplinary courses. **The accessible web-based nature of the developed material can affect a broad population**."

#1505058 – PERKS: Power Electronics Refined learning via affordable Kit and Software tutor

National Science Foundation
Division of Undergraduate Education (DUE)

IUSE:EHR Program

Two Program Tracks

Engaged Student Learning

Two Approaches

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

Focus on design, development, implementation of and research on STEM learning models, approaches, and tools

Development & Implementation (larger scale)
Level I:
Up to $600K Up to 3 yrs
Level II:
$601K to $2M Up to 5 yrs

Institutional and Community Transformation

Two Approaches

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

Focus on approaches to increase the propagation of highly effective methods of STEM teaching and learning

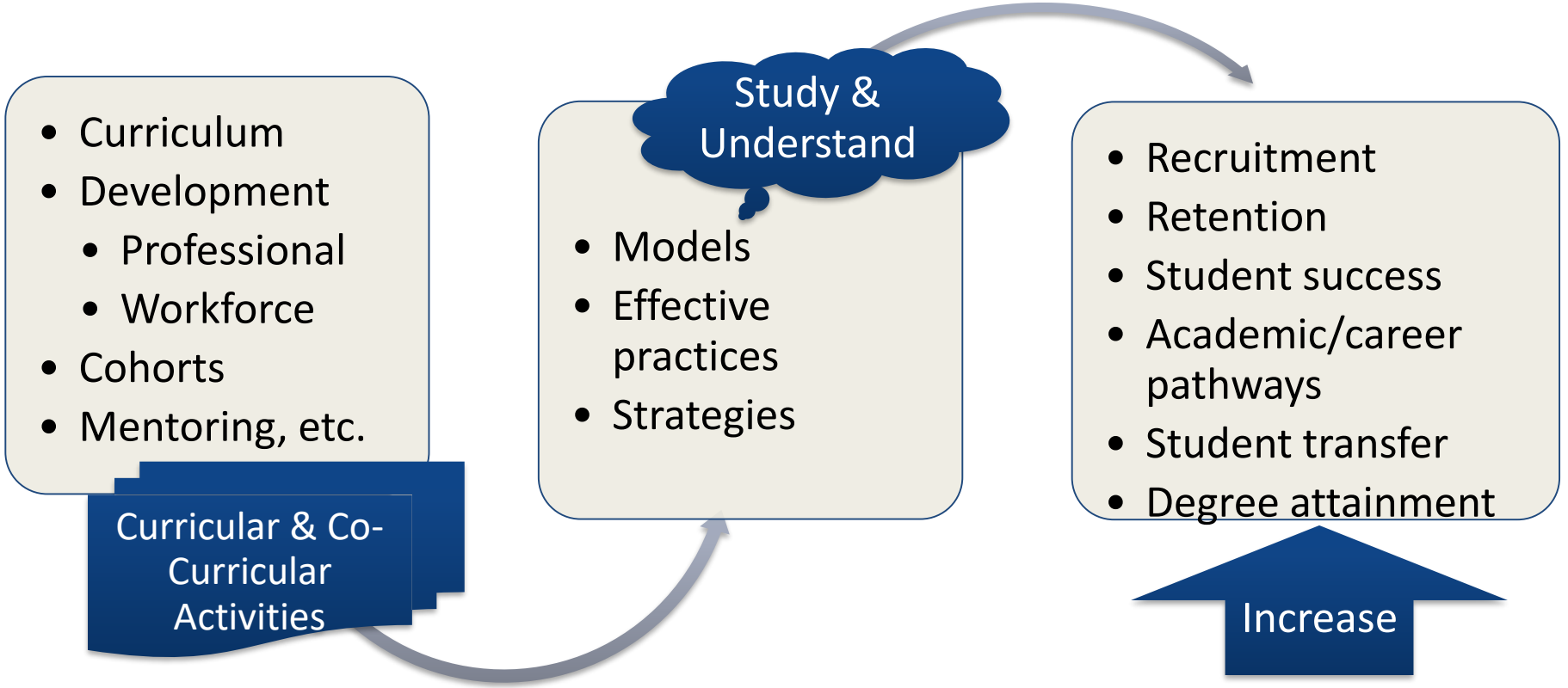
Development & Implementation (larger scale)
Up to $3M
Up to 5 yrs

National Science Foundation
Division of Undergraduate Education (DUE)

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

National Science Foundation
Division of Undergraduate Education (DUE)

S-STEM:
Knowledge Generation

Issue: Some proposals may appear to be "totally focused" on simply giving out scholarships.

Background: A major goal of the new solicitation is that all proposals should be "**knowledge generating**." Projects should be gathering information on their unique thrust. Learning about how the …

- particular workforce needs identified,
- instructional focus of their academic programs, and
- support structures targeting "points of failure" identified in an institutional scan

…work together and how they are being evaluated and the "lessons learned" disseminated to the broader S-STEM community.

We want to learn how to best award scholarships to have the maximum impact!

National Science Foundation
Division of Undergraduate Education (DUE)

S-STEM Program

Institutional Capacity Building (Track 1)

Image courtesy of 7Crafts at FreeDigitalPhotos.net

Up to $650K
Up to 5 yrs

For institutions with limited experience in implementing effective curricular and co-curricular activities

Deadline (All Proposals):
Last Wednesday in March, annually

Design and Development

(Track 2)

Up to $1M
Up to 5 yrs

(Track 3)

Up to $5M
Up to 5 yrs

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

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Education & Human Resources (EHR)

- Education & Human Resources (EHR) Home
- About
- Programs
- Staff
- Funding
- Awards
- News
- Events
- Additional Resources
- Graduate Education (DGE)
- Research on Learning in Formal and Informal Settings (DRL)
- Undergraduate Education (DUE)
- Human Resource Development (HRD)

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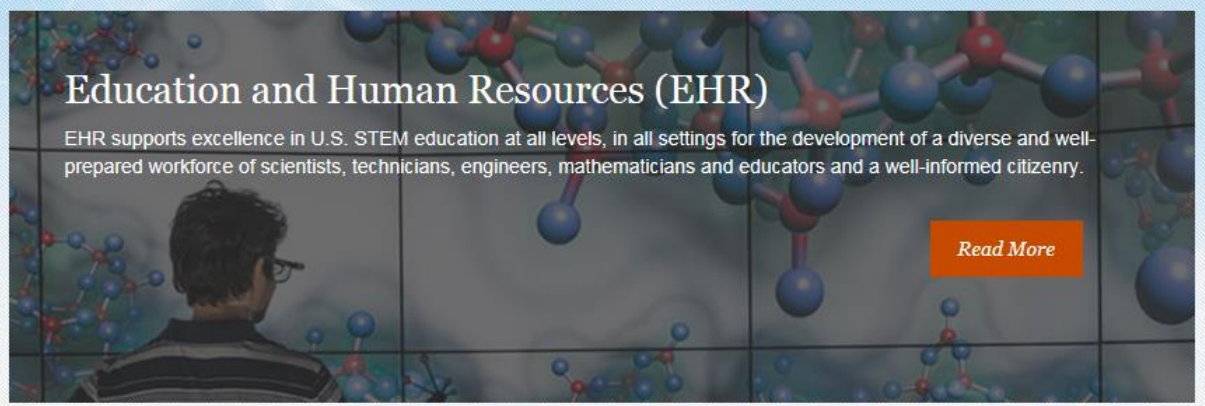


Announcements

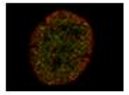
Division Director Employment Opportunity **Read More ›**

Special Announcements **Read More ›**

EHR Core Research **Read More ›**

See All ›

News



Super resolution imaging helps determine a stem cell's future
FEBRUARY 27, 2017

What does Black History Month mean to some of the nation's top educators?
FEBRUARY 27, 2017

Note from the director: Broadening participation through NSF INCLUDES
FEBRUARY 23, 2017

See All ›

Divisions

Division of Graduate Education (DGE)

The Division of Graduate Education (DGE) provides funding to support graduate students and the development

Division of Human Resource Development (HRD)

HRD programs support and promote activities that seek to strengthen STEM education for underserved communities,

Division of Undergraduate Education (DUE)

DUE focuses on strengthening STEM education at two- and four-year institutions by improving curricula,

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- Education & Human Resources (EHR) Home
- Graduate Education (DGE)
- Research on Learning in Formal and Informal Settings (DRL)
- Undergraduate Education (DUE)
  - About
  - Programs
  - Staff
  - Funding
  - Awards
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Announcements

EHR Core Research **Read More ›**

New Reports Issued **Read More ›**

Reviewer Recruitment Form **Read More ›**

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News

Third annual Community College Innovation Challenge open for submissions
OCTOBER 17, 2016

Community College Innovation Challenge
OCTOBER 17, 2016

Lacking other meaningful data, university faculty devise their own evaluation systems
AUGUST 23, 2016

See All ›

Funding Opportunities

Robert Noyce Teacher Scholarship Program
(NSF 17-541) POSTED FEBRUARY 9, 2017

Faculty Early Career Development Program

Upcoming Due Dates

Innovations at the Nexus of Food, Energy and Water Systems
(NSF 17-530) FULL PROPOSAL: MARCH 6, 2017

Software Infrastructure for Sustained Innovation

Popular Links

- Career Opportunities

See All Additional Resources ›

Division of Graduate Education (DGE)

Directorate for Education and Human Resources

Presenters: Earnestine Easter, PhD and Giselle Muller-Parker, PhD

Funding Opportunities in the Division of Graduate Education

Earnestine Easter, Program Director
(epsalmon@nsf.gov)

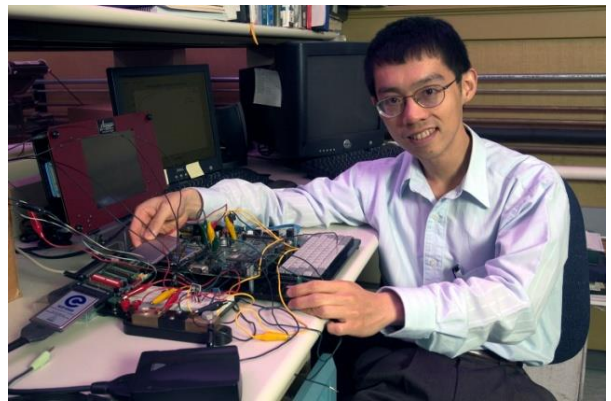
Gisele Muller-Parker, Program Director
(gtmuller@nsf.gov)

NSF Investment Focus in Graduate Education

- Training in national S&E priority areas
- Innovative models for graduate education with potential for scalability
- Research knowledge base to inform improvements in graduate education
- Professional development of graduate students for both academic and non-academic careers

Division of Graduate Education

- Supports U.S. graduate students and innovative graduate programs to prepare tomorrow's leaders in STEM.
- Provides leadership for the use and conduct of research to inform implementation of approaches, practices, and models for STEM professional workforce development



Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

CyberCorps Scholarship for Service

EHR Core Research: Workforce Development

Division of Graduate Education Portfolio

Graduate Research Fellowship Program

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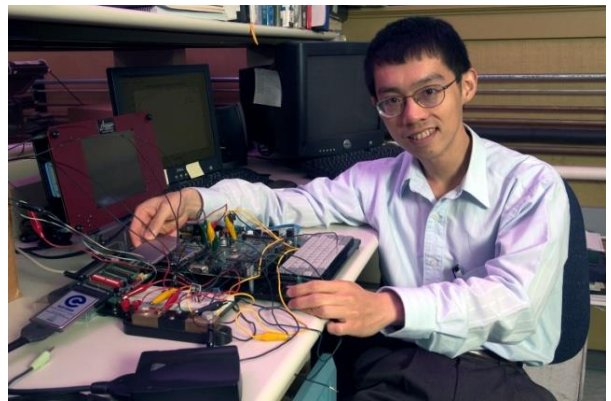


Goals of

Graduate Research Fellowship Program (GRFP)

- To select, recognize, and financially **support individuals** who have demonstrated the potential to be high achieving scientists and engineers, early in their careers.

- To **broaden participation** in science and engineering of underrepresented groups, including women, minorities, persons with disabilities and veterans.

Outcome: Recruit and retain these individuals in the U.S. STEM workforce

Why fellowships?

For undergraduate seniors and beginning graduate students:

- Prestige of the fellowship opens doors to graduate school
- Greater choice of research advisors
- Freedom to do their own research
- More time to do their research
- Establishes connections with federal funding agencies at an early stage, useful for future sponsored research opportunities
- 5 years as Fellow: 3 years of support; additional opportunities

For undergraduate and graduate institutions:

- Prestige – fellowship recipients enhance national image
- High quality graduate students selected by an independent competitive process
- Inclusive of undergraduates, women, minorities, persons with disabilities and veterans we need to recruit!

Graduate Research Fellowship Program

Key Elements

Five Year Award – $138,000 per Fellow

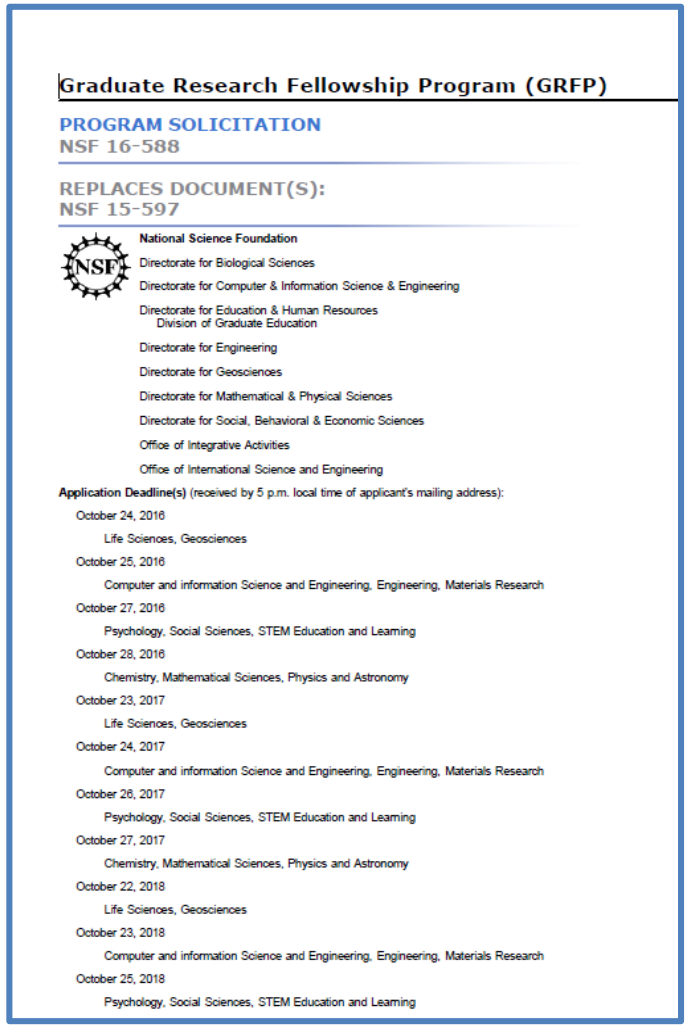
Three years of support
$34,000 Stipend per year
$12,000 Educational allowance to institution
Career Life Balance (family leave)
Supercomputer access: XSEDE
Professional Development Opportunities:

GROW: International

GRIP: Federal Internships

GRFP Solicitation (NSF 16-588)

- Provides the following information:
  - **Deadlines**
  - **Program description**
  - **Award information**
  - **Eligibility requirements**
  - **Application preparation**
  - **Submission instructions**
  - **Application review criteria**



Graduate Research Fellowship Program (GRFP)

PROGRAM SOLICITATION
NSF 16-588

REPLACES DOCUMENT(S):
NSF 15-597

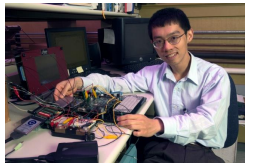
National Science Foundation
Directorate for Biological Sciences
Directorate for Computer & Information Science & Engineering
Directorate for Education & Human Resources
Division of Graduate Education
Directorate for Engineering
Directorate for Geosciences
Directorate for Mathematical & Physical Sciences
Directorate for Social, Behavioral & Economic Sciences
Office of Integrative Activities
Office of International Science and Engineering

Application Deadline(s) (received by 5 p.m. local time of applicant's mailing address):

October 24, 2016
Life Sciences, Geosciences
October 25, 2016
Computer and information Science and Engineering, Engineering, Materials Research
October 27, 2016
Psychology, Social Sciences, STEM Education and Learning
October 28, 2016
Chemistry, Mathematical Sciences, Physics and Astronomy
October 23, 2017
Life Sciences, Geosciences
October 24, 2017
Computer and information Science and Engineering, Engineering, Materials Research
October 26, 2017
Psychology, Social Sciences, STEM Education and Learning
October 27, 2017
Chemistry, Mathematical Sciences, Physics and Astronomy
October 22, 2018
Life Sciences, Geosciences
October 23, 2018
Computer and information Science and Engineering, Engineering, Materials Research
October 25, 2018
Psychology, Social Sciences, STEM Education and Learning

GRFP Eligibility

- U.S. citizens and permanent residents
- Early-career: undergrad & grad students
- Pursuing research-based MS or PhD
- Science and engineering
- Enrolled in accredited institution in US by Fall



Academic Levels

- **1: Seniors or baccalaureates with no graduate study yet**
- 2: First-year graduate students
- 3: Second-year graduate students

  (≤ 12 months of graduate study by August)

- **4:** >12 months graduate study, with interruption in graduate study of 2+ years (can have MS degree)

Eligibility

New Eligibility Rules (NSF 16-050)

Level 1: Seniors/baccalaureates: **no graduate study**

Level 2: First-year **graduate students**

Level 3: Second-year **graduate students**

≤ 12 months of graduate study by August 1, 2016

Only once in grad school

Level 4: >12 months **graduate study**

with an interruption in graduate study of 2+ years

GRFP Fields of Study

- Chemistry
- Computer & Information Science/Engineering
- Engineering
- Geosciences
- Life Sciences
- Materials Research
- Mathematical Sciences
- Physics and Astronomy
- Psychology
- Social Sciences
- STEM Education

Not Supported

- Joint science-professional degree programs (e.g. MD/PhD, JD/PhD)
- Business administration or management
- Counseling, Social work
- Education (except STEM education)
- History (except history of science)
- Research with directly disease-related goals
- Clinical study
  - patient-oriented research
  - epidemiological and behavioral studies
  - outcomes research
  - health services research

GRFP Complete Application

Complete Application Package:

1) Personal, Relevant Background and Future Goals **Statement** (3 pages)

2) Graduate **Research Statement** (2 pages)

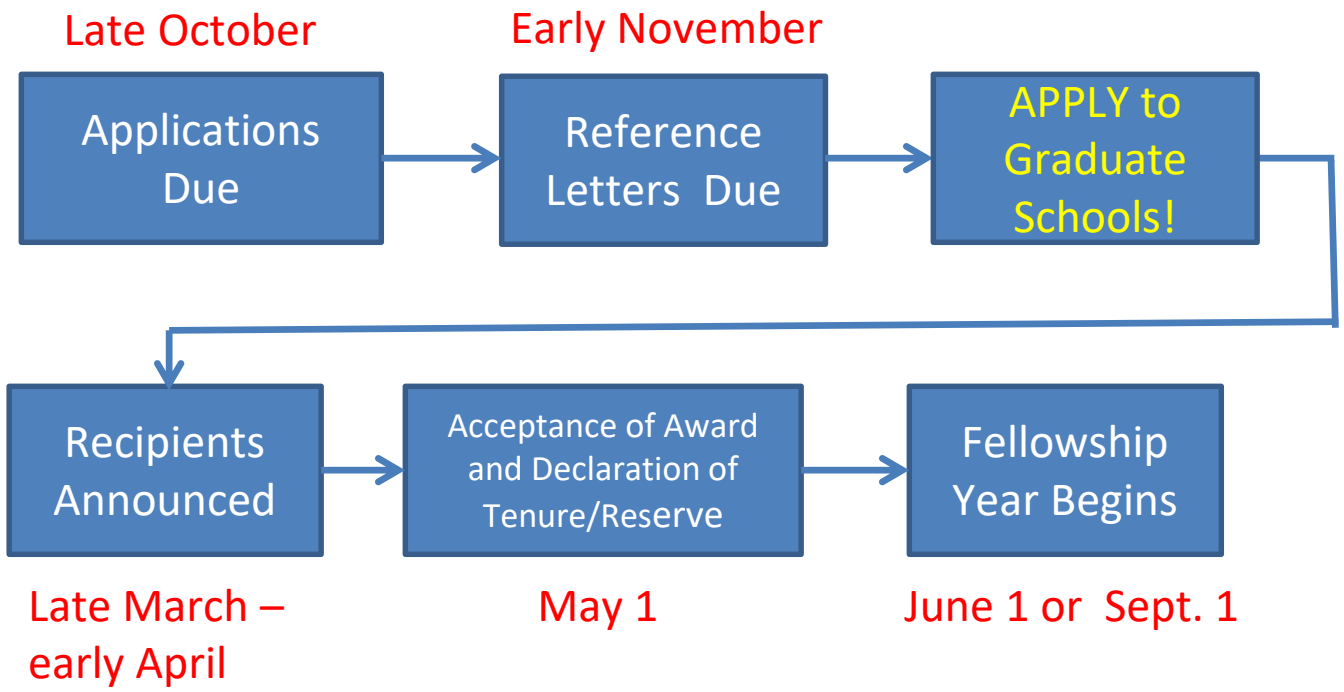
3) Transcripts (uploaded electronically)

4) Three **letters of reference**

DEADLINES: October/November 2017

Refer to Solicitation NSF 16-588

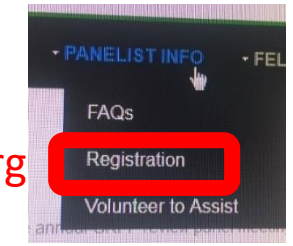
GRFP Application Timeline



GRFP on Campus

- Promote benefits of GRFP to undersubscribed departments
  - Juniors (REU), seniors, beginning grad students
- Partner/engage with Honors College and honors programs, REU Site Coordinators
- Reach out to GRFP Resource People on www.nsfgrfp.org
- Engage local/campus GRFP Coordinating Officials (www.fastlane.nsf.gov/grfp/)
- Support courses on science communication and proposal writing, include peer review

Sign up as a REVIEWER/PANELIST at www.nsfgrfp.org



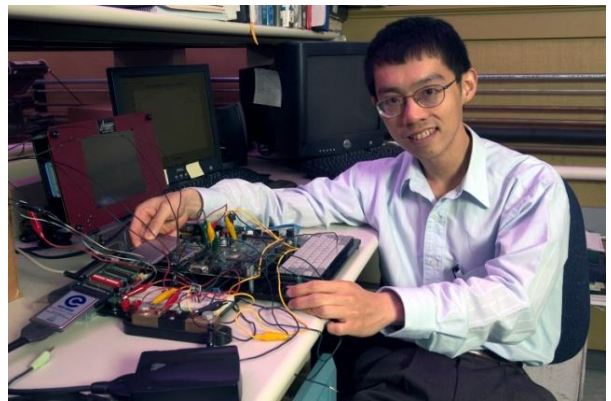
Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

CyberCorps Scholarship for Service

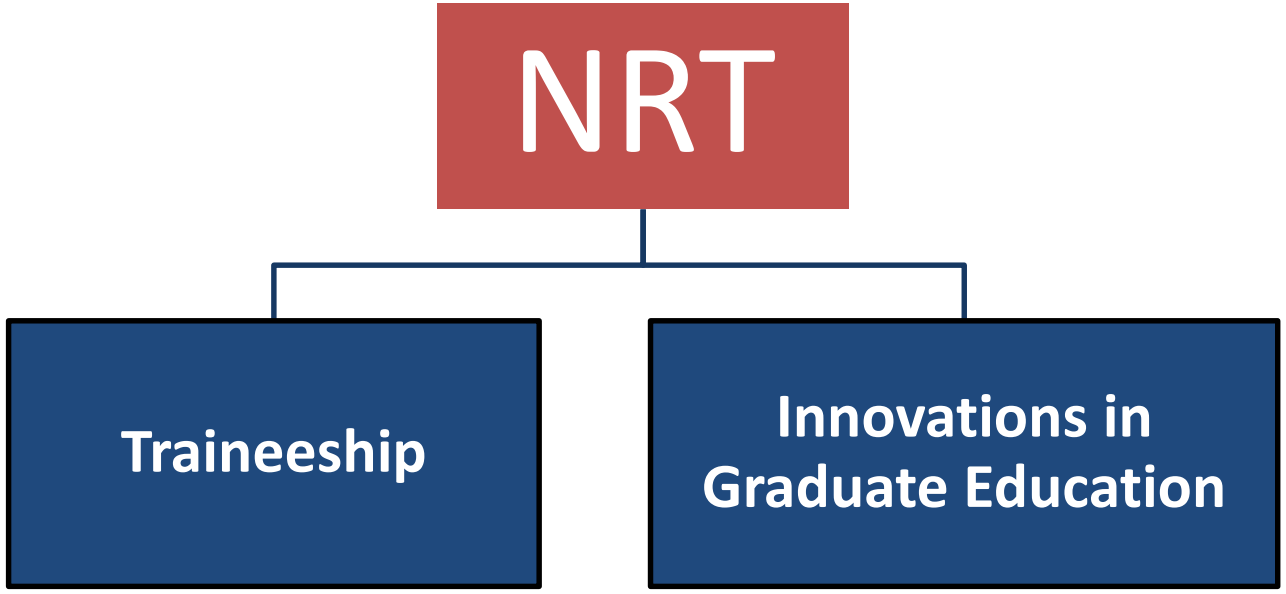
EHR Core Research: Workforce Development



NSF Research Traineeship (NRT) Program

NSF 16-503 ***(Being Revised)***

Research and Capacity Building & Student Support



2017 Deadlines TBD

How Do they Differ?

	Traineeship	IGE
Primary Aim	Comprehensive graduate student training	Pilot, test, and evaluate targeted new approaches, models and activities
Interdisciplinary	Yes	Not Required
Stipend & COE Support:	Yes	No
Duration/Amount	Up to 5 years; < $3 M	Up to 3 years, $300K-$500K
Limit per Organization	2	2
Eligible Organizations	US Institutions that award research-based master's and doctoral degrees	All organizations eligible to submit to the NSF

NRT Addresses Graduate Preparedness

- Develop innovative approaches to graduate education for MS and/or PhD students
- Expand/enhance professional development
- Encourage strategic collaborations with stakeholders (e.g., university-industry partnerships)
- Rely on existing evidence of effective practices in STEM education (evidence-based approaches)
- Generate new knowledge that promotes transformative improvements in graduate education

Sample Projects

- IGE: Flipping a Foundational Interdisciplinary Graduate Curriculum While Strengthening Connections Outside Academia – *University of Minnesota Duluth*

- NRT: Accessibility, Rehabilitation, and Movement Science: An Interdisciplinary Traineeship Program in Human-Centered Robotics – *Georgia Tech Research Corporation*

- IGE: Nanomedicine Academy of Minority Serving Institutions – *Northeastern University*

- NRT: Education Model Program on Water-Energy Research at Syracuse University – *Syracuse University*

FY 2018 *Traineeship* Priority Areas

- **I**nnovations at the **N**exus of **F**ood, **E**nergy and **W**ater **S**ystems (**INFEWS**)

- **U**nderstanding **t**he **B**rain (**UtB**)

Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

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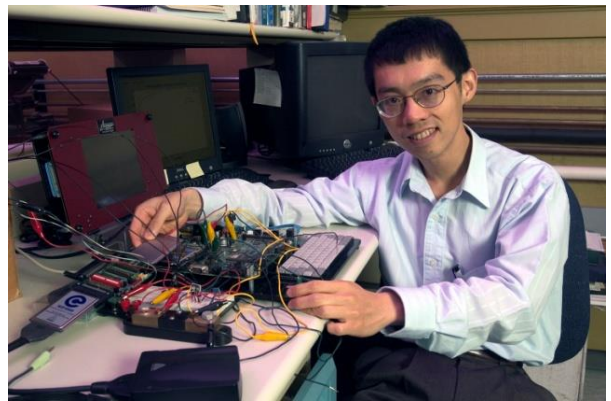
EHR Core Research: Workforce Development



CyberCorps®

Scholarship for Service (SFS) NSF 17-556

Goals:

- Increase the number of **qualified students** entering the fields of information assurance and computer security
- Increase the **capacity of the US higher education enterprise** to continue to produce professionals in these fields to meet the needs of our increasingly technological society

Scholarship Track: July 10-31, 2017
Capacity Track: November 17-Dec 5, 2017

CyberCorps®: Scholarship for Service (SFS)

Scholarship Track

Typical award: $3-5M/Scholarship grant to colleges and universities

- **Funding**: full tuition, fees plus stipends ($22.5K/$34K per year)
- **Length:** Up to 3-year scholarship for undergraduate or graduate (master's or doctoral) education
- **Obligation**: Summer internship, post-graduation service requirement (work in Federal/State/Local/Tribal agency equal to scholarship length)
- **Students Eligibility:**
  - U.S. Citizen or Permanent Resident, enrolled in Cybersecurity program
  - Eligible for Federal employment (able to acquire security clearance)

Capacity Building Track

Up to *$500K per Capacity Building project*

- Supports efforts related to curriculum, outreach, faculty, institutional, and/or partnership development.

Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

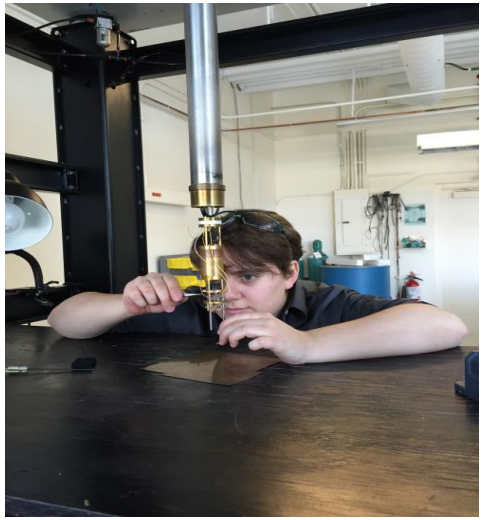
CyberCorps Scholarship for Service

EHR Core Research: Workforce Development

ECR Program Goals NSF 15-509

Fundamental Research in Science, Technology, Engineering and Mathematics (STEM) Education

- Provide a coherent foundation of theory and research evidence to guide and improve STEM learning
- Design of learning environments
- Research evidence to support STEM workforce development
- Broadening participation in STEM education



Program Strands

- ➢ STEM Learning/Learning Environments
- ➢ Broadening Participation and Institutional Capacity
- ➢ STEM Professional Workforce Development

STEM Learning and Learning Environments

Topics

- STEM learning
  - Neural and cognitive bases of STEM learning
  - Affective dimensions of learning
  - Education policy and policy-relevant research

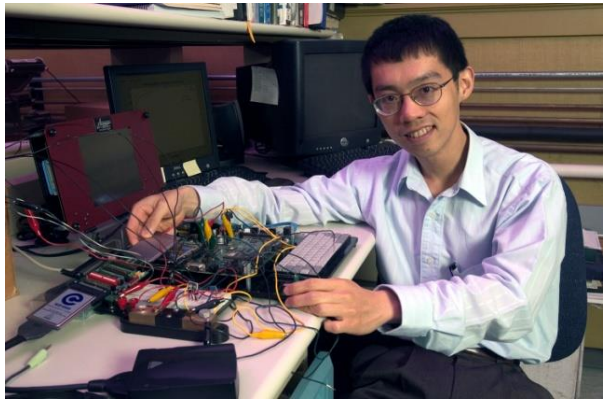
- STEM learning environments
  - Improvements in a range of learning outcomes
  - Alignment of curriculum, instruction and assessment
  - Development of diagnostic and performance assessments

Broadening Participation in STEM

- Practices that broaden participation, retention, and success of individuals underrepresented in STEM
- Preparing students for successful transition to further education or training, or the STEM workplace
- Study of accessibility and the impacts of technology on diverse populations
- Measures, processes and metrics to assess impacts and outcomes of broadening participation and institutional capacity building (e.g. on STEM innovation/productivity)

STEM Professional Workforce Development

- Impact of different funding models on student preparation
- Persistence in STEM majors and careers
- Influence of public/private partnerships on workforce preparation
- Alignment of skills and competencies and workforce requirements
- Implications of labor market trends on STEM education and training



Sample Workforce Development Projects

- Progressions of Skill Development in Biology Doctorates – *David Feldon, Utah State University*

- STEM Workforce Training: A Quasi-Experimental Approach Using the Effects of Research Funding – *Bruce Weinberg, Ohio State University*

- Exploring the Alignment Among Employer Expectations for STEM Skills and the Design of Education Curricula and Interventions – *Matthew Hora, University of Wisconsin-Madison*

ECR Program Features

- Fundamental research in STEM education about critical areas that are essential, broad and enduring.
- Synthesis or expansion of research foundations in the focal areas.
- Contribution to the accumulation of robust evidence to guide interventions and innovations.

- Focus on persistent challenges in STEM education and workforce development.
- Development of foundational knowledge in STEM formal and informal learning and learning contexts for all groups and stages of development.

Proposal Types and Funding

Three levels

- Level I - $500,000 – maximum of three years
- Level II - $1,500,000 – maximum of three years
- Level III - $2,500,000 – maximum of five years

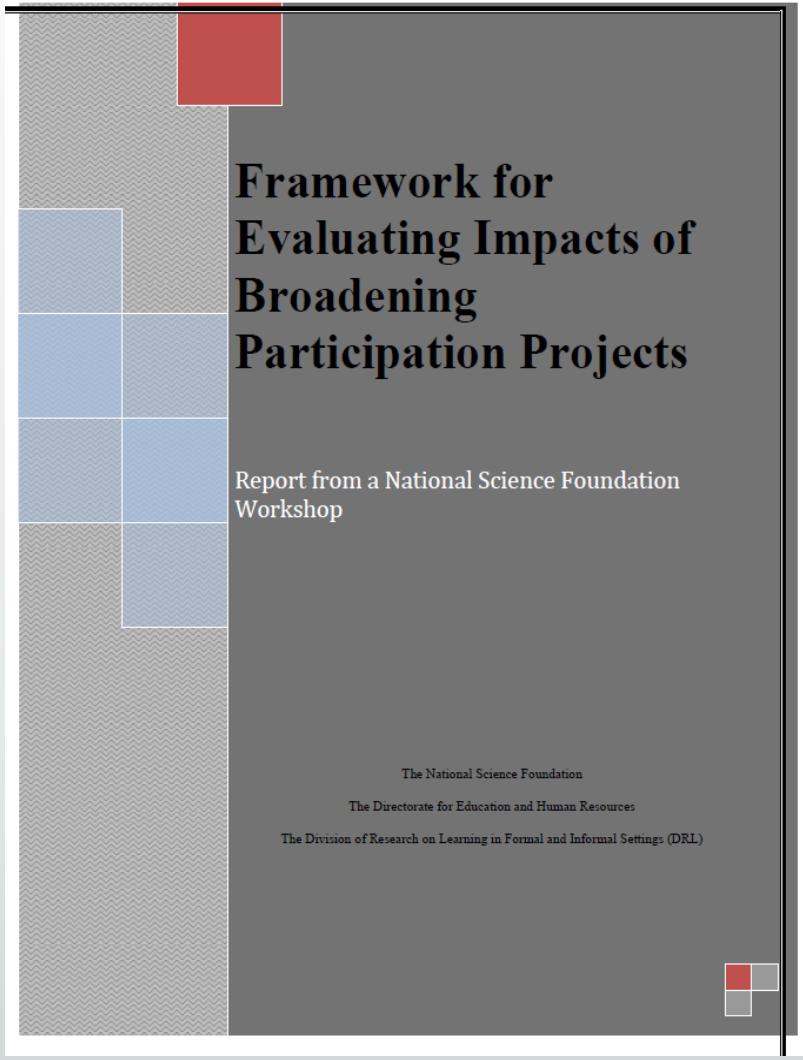
Synthesis and conference/workshop proposals

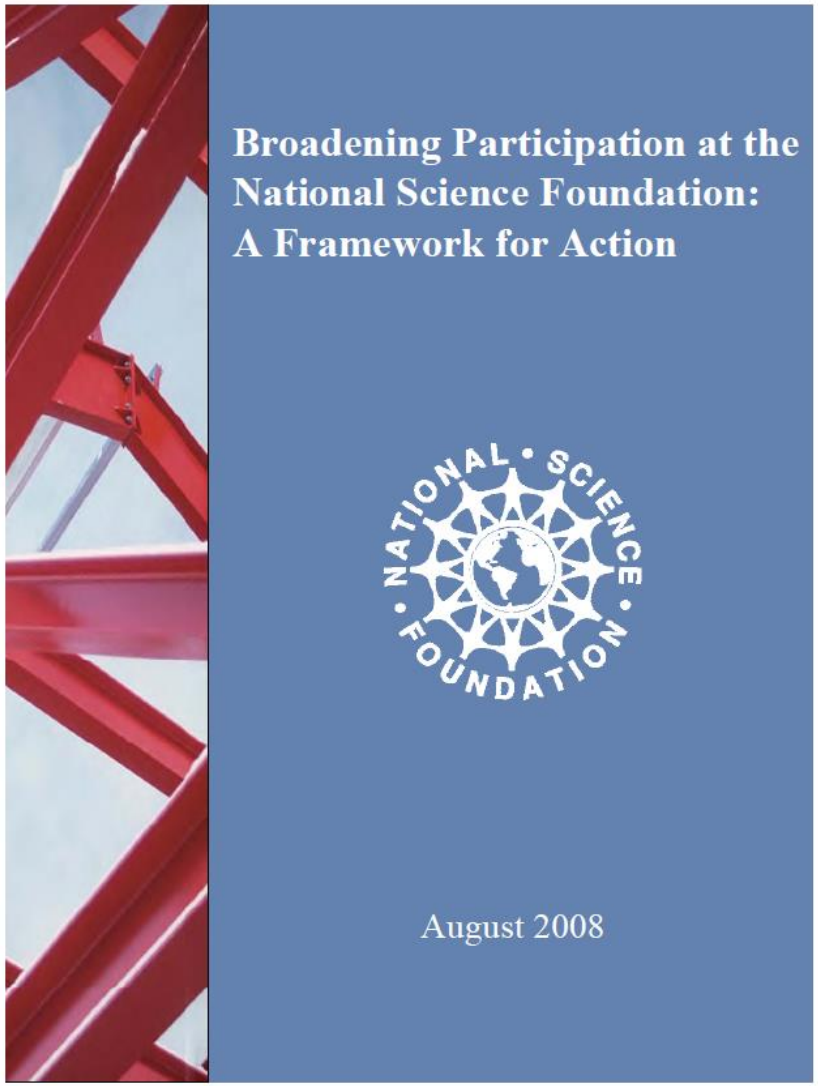
Deadline: September 14, 2017

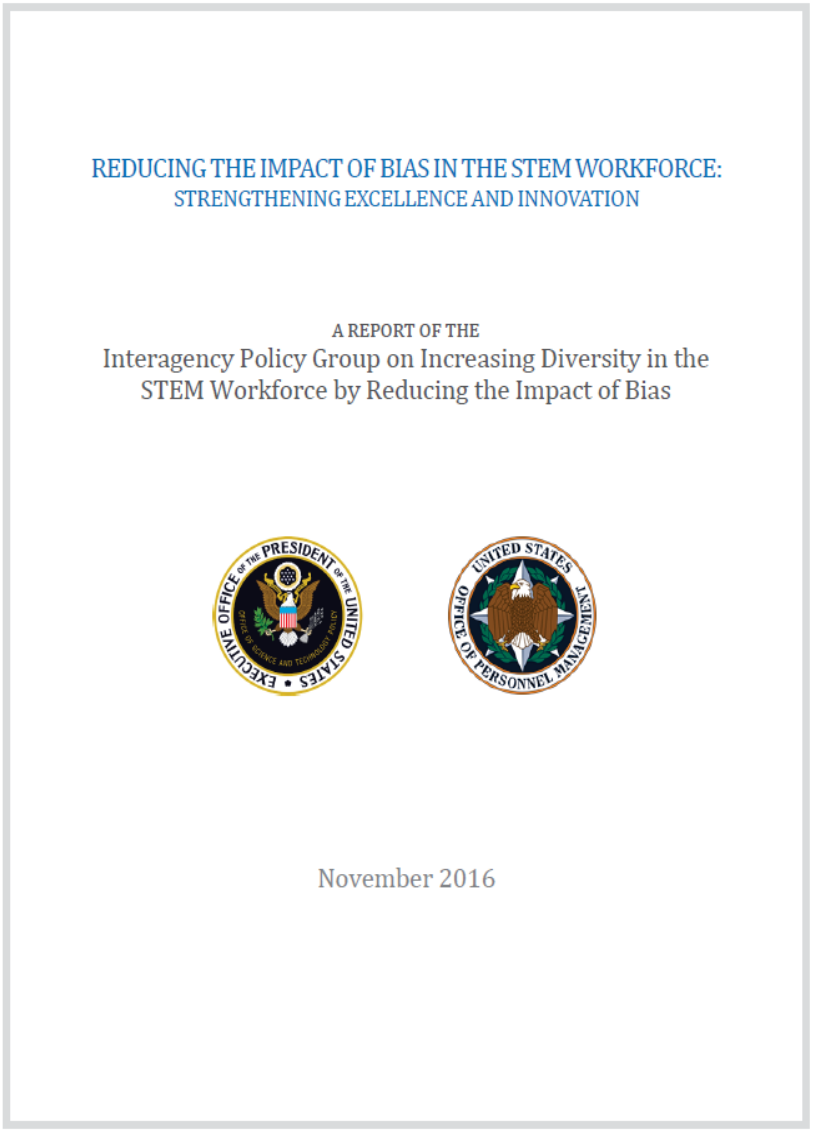
Capacity Building & Professional Development

Directorate for Education and Human Resources

Resources







- Resource Centers & Networks
- Program Solicitations, Dear Colleague Letters

Capacity Building & Professional Development

- NSF Summer Scholars Internship Program (HACU, QEM, WINS)
- Attend NSF Days Events, Workshops, and Webinars
- Serve as a proposal reviewer (ad hoc) and panelist (in-person, virtual)
- Get Connected (social media, Science360, Science Nation, Discovery Files Podcast)
- Consider joining NSF as a Rotator!
- Contact NSF Program Officers if you have questions about a program
- **Submit Proposals!**

NSF Opportunities

Broadening Participation in STEM

Directorate for Education and Human Resources (EHR)