STEM Learning and Research (STELAR) Center @ Education Development Center

NSF Opportunities: Broadening Participation in STEM

Thursday, July 28th 2016

Find resources: http://stelar.edc.org/
Contact us: stelar@edc.org

stelar
STEM Learning and Research Center

NSF

EDC Learning transforms lives.

NSF Opportunities
Broadening Participation in STEM

Directorate for Education and Human Resources (EHR)

National Science Foundation

"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.
- FY16 Annual Budget: $7.5 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

OFFICE OF THE DIRECTOR
703.292.8000

France A. Córdova
Director

Vacant
Deputy Director

NATIONAL SCIENCE BOARD (NSB)
Dan E. Arvizu
Chair

Kelvin K. Droegemeier
Vice Chair
703.292.7000

NATIONAL SCIENCE BOARD OFFICE
Michael Van Woert
Executive Officer
703.292.7000

OFFICE OF INSPECTOR GENERAL (OIG)
Allison C. Lerner, Inspector General
703.292.7100

Richard Buckius
Chief Operating Officer

OFFICE OF DIVERSITY & INCLUSION (ODI)
Rhonda Davis, Head
703.292.8020

OFFICE OF THE GENERAL COUNSEL (OGC)
Lawrence Rudolph, General Counsel
Peggy Rodia, Deputy GC
703.292.8060

OFFICE OF INTEGRATIVE ACTIVITIES (OIA)
Suzanne Iacono, Head
703.292.8040

OFFICE OF INTERNATIONAL SCIENCE & ENGINEERING (OISE)
Rebecca Keiser, Head
703.292.8710

OFFICE OF LEGISLATIVE & PUBLIC AFFAIRS (OLPA)
Amanda Greenwell, Head
703.292.8070

Directorates and Offices

DIRECTORATE FOR BIOLOGICAL SCIENCES (BIO)

DIRECTORATE FOR COMPUTER & INFORMATION SCIENCE & ENGINEERING (CISE)

DIRECTORATE FOR EDUCATION & HUMAN RESOURCES (EHR)

DIRECTORATE FOR ENGINEERING (ENG)

DIRECTORATE FOR GEOSCIENCES (GEO)

DIRECTORATE FOR MATHEMATICAL & PHYSICAL SCIENCES (MPS)

DIRECTORATE FOR SOCIAL, BEHAVIORAL, & ECONOMIC SCIENCES (SBE)

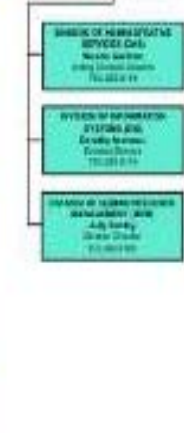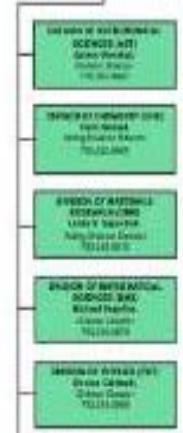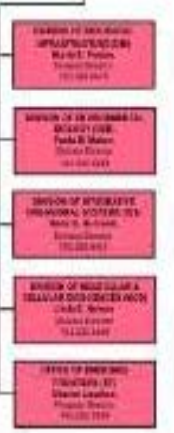**OFFICE OF BUDGET, FINANCE, & AWARD MANAGEMENT (BFA)**

OFFICE OF INFORMATION & RESOURCE MANAGEMENT (OIRM)

February 2016

National Science Foundation

Inclusiveness

Seeking and embracing contributions from all sources, including underrepresented groups, regions, and institutions
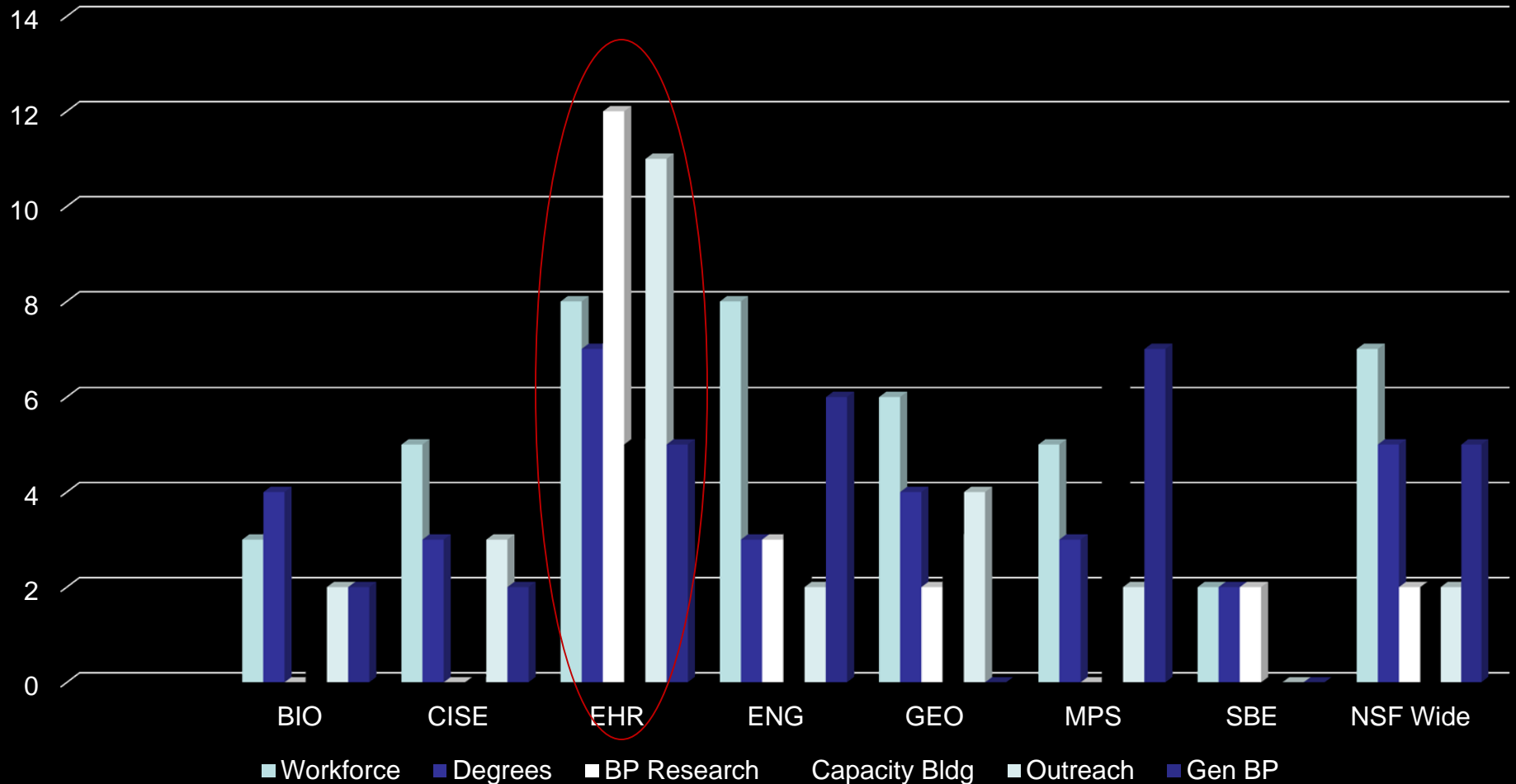
(Broadening Participation)

NSF BP Portfolio Program Goals

from *IDA Science and Technology Policy Institute (STPI), 2015*

BP Focused Programs

Group/Program	Amount of Funding Captured	FY 2015 Actual	FY 2016 Estimate	FY 2017 Request (Discretionary)	FY 2017 Request (Mandatory)[1]	FY 2017 Request	FY 2017 Request Change Over FY 2016 Estimate	
							Amount	Percent
ADVANCE ✹	100%	$14.89	$14.90	$14.10	-	$14.10	-$0.80	-5.4%
Alliances for Graduate Education & the Professoriate (AGEP) ✹	100%	8.00	8.00	8.00	-	8.00	-	-
AGEP Graduate Research Supplements (AGEP-GRS) ✹	100%	2.47	0.45	2.60	-	2.60	2.15	477.8%
Broadening Participation in Biology Fellowships ✹	100%	3.80	2.50	2.50	-	2.50	-	-
Broadening Participation in Engineering (BPE)	100%	8.86	7.00	7.00	-	7.00	-	-
Career-Life Balance (CLB)	100%	0.49	1.00	1.00	-	1.00	-	-
Centers of Research Excellence in Science & Technology (CREST) ✹	100%	24.01	24.00	24.00	-	24.00	-	-
Excellence Awards in Science & Engineering (EASE)[2] ✹	100%	5.92	5.82	5.82	-	5.82	-	-
Historically Black Colleges & Universities Undergraduate Program (HBCU-UP) ✹	100%	32.04	35.00	35.00	-	35.00	-	-
Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES) ✹	100%	-	15.50	16.00	-	16.00	0.50	3.2%
Louis Stokes Alliances for Minority Participation (LSAMP) ✹	100%	45.91	46.00	46.00	-	46.00	-	-
Partnerships for Research & Education in Materials (PREM)	100%	7.00	6.80	6.43	-	6.43	-0.37	-5.4%
Partnerships in Astronomy & Astrophysics Research Education (PAARE)	100%	1.00	2.00	1.50	-	1.50	-0.50	-25.0%
SBE Postdoctoral Research Fellowships-Broadening Participation	100%	1.11	1.50	1.50	-	1.50	-	-
SBE Science of Broadening Participation	100%	2.14	1.50	1.50	-	1.50	-	-
Tribal Colleges & Universities Program (TCUP) ✹	100%	13.58	14.00	14.00	-	14.00	-	-
Subtotal, Focused Programs		**$171.21**	**$185.97**	**$186.95**	**-**	**$186.95**	**$0.98**	**0.5%**

✹ = EHR Program

BP Emphasis Programs

(Dollars in Millions)

Group/Program	Amount of Funding Captured	FY 2015 Actual	FY 2016 Estimate	FY 2017 Request (Discretionary)	FY 2017 Request (Mandatory)[1]	FY 2017 Request	FY 2017 Request Change Over FY 2016 Estimate Amount	Percent
Advancing Informal STEM Learning (AISL) ✹	58%	$31.91	$36.25	$31.90	$4.35	$36.25	-	-
Discovery Research PreK-12 (DR-K12) ✹	59%	49.60	48.82	48.82	-	48.82	-	-
General and Age Related Disabilities Engineering (GARDE)	50%	1.70	1.70	1.70	-	1.70	-	-
Graduate Research Fellowship (GRF) ✹	61%	203.28	202.47	202.62	-	202.62	0.15	0.1%
Robert Noyce Teacher Scholarship Program (NOYCE) ✹	60%	36.64	36.53	36.53	-	36.53	-	-
NSF Scholarships in STEM (S-STEM)[2] ✹	59%	64.51	44.25	44.25	-	44.25	-	-
STEM + Computing Partnerships (STEM+C Partnerships) ✹	55%	40.89	35.41	18.56	16.85	35.41	-	-
Subtotal, Emphasis Programs		**$428.51**	**$405.43**	**$384.38**	**$21.20**	**$405.58**	**$0.15**	**0.0%**

Totals may not add due to rounding.

[1] Includes only new mandatory funding. Excludes H1B Non-Immigrant Petitioner mandatory funds.

[2] Amounts for NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) are H-1B Non-Immigrant Petitioner mandatory funds.

Emphasis Programs have broadening participation as one of several emphases but broadening participation is not an explicit goal of the program. These programs are included at a percentage of their funding level. The percentage used equals the 3-year average percentage of the programs' award portfolio that meets one the following criteria where an award:

- Was to a Minority Serving Institution (MSI);
- Had at least 50 percent of its principal investigators from an underrepresented group; or
- Had at least 50 percent of the students or postdocs supported by the grant reporting themselves as members of an underrepresented group on project reports.

✹ = EHR Program

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.

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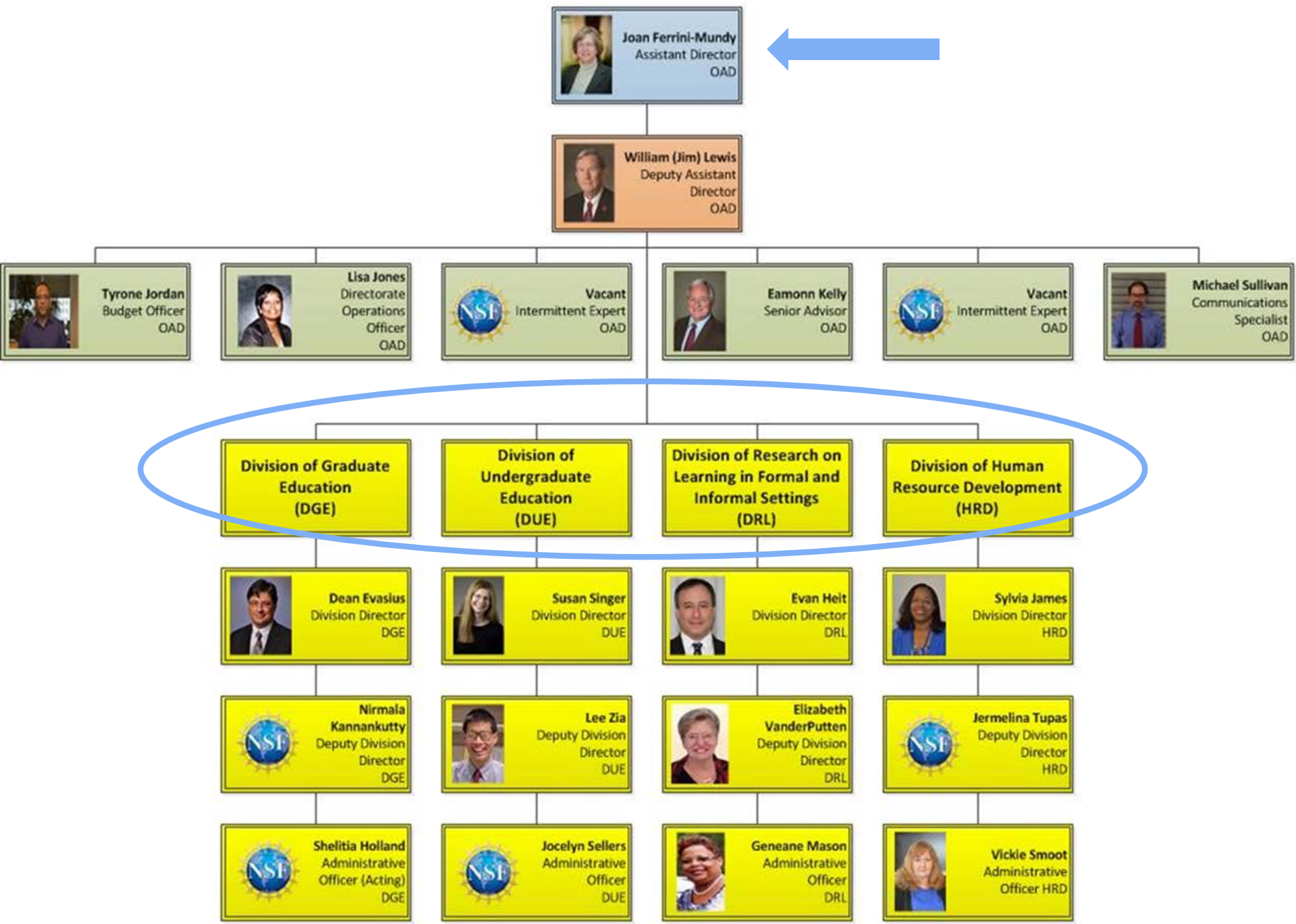
Directorate for Education and Human Resources (EHR)

<u>Broadening Participation and Institutional Support</u>

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.

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 inquires regarding funding opportunities

- Share other capacity building and professional development opportunities within EHR and across NSF

Agenda

- Welcome/Introduction - Dr. Monya Ruffin
- Division of Research on Learning – Dr. Bob Russell
- Division of Human Resource Development – Dr. Claudia Rankins
- Division of Graduate Education – Dr. Earnestine Easter
- Division of Undergraduate Education – Drs. Gul Kremer and Olga Pierrakos
- Final Remarks – Dr. Monya Ruffin

Welcome to the Directorate for Education and Human Resources

Directorate for Education and Human Resources (EHR)

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

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)**
- **STEM+C**
- **Advanced Technological Education (ATE)**

Innovative Technology Experiences for Students and Teachers (ITEST)
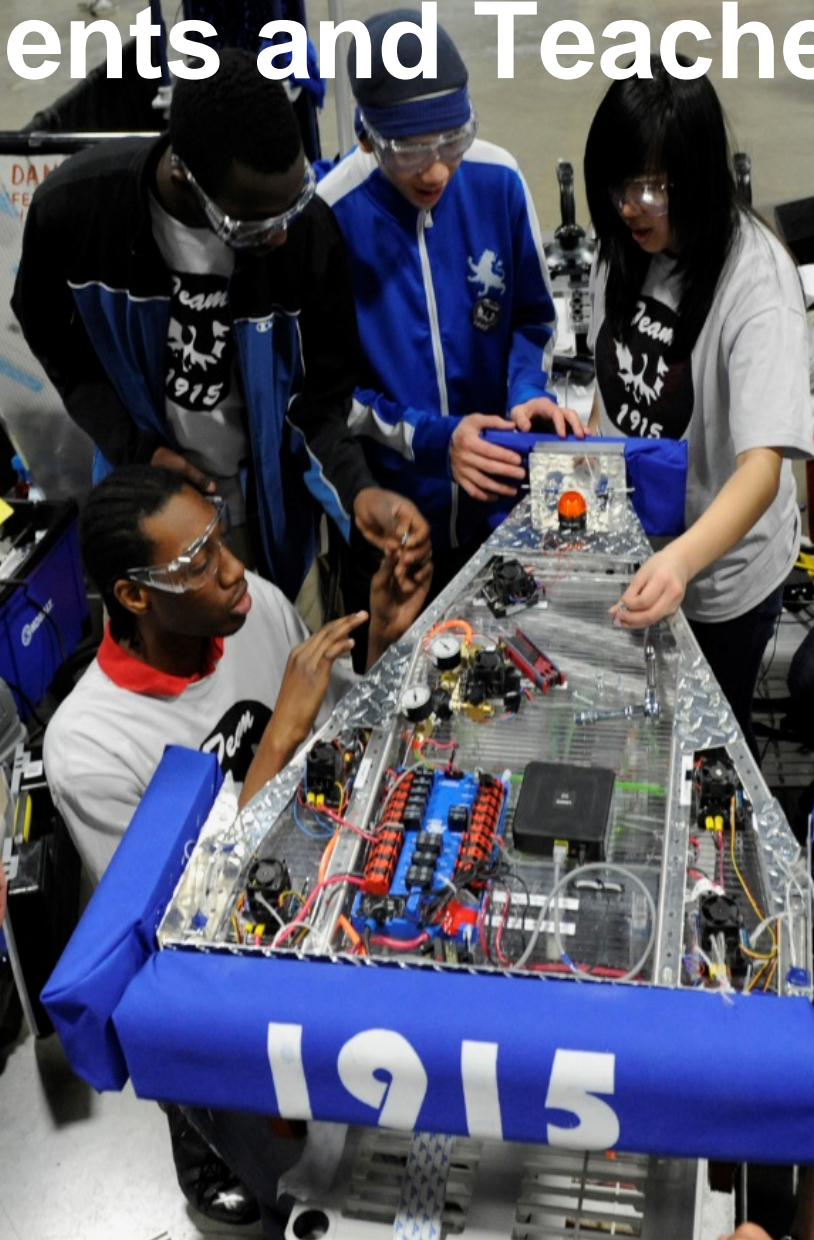
ITEST Program Overview

- 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 (15-599)

- Two project types: Strategies and SPREAD

- Funded through H1-B Work Visa Revenue

- **Additional Solicitation Specific Criteria related to broadening participation for all ITEST proposals.**

- **Proposal Deadline: August 10, 2016**

- Resource Center: STELAR, http://stelar.edc.org/

Anticipated ITEST Program Funding Amount: $35,000,000

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

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)

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

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

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

- **Proposal Deadline: November 8, 2016**

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

STEM + Computing Partnerships (STEM+C)
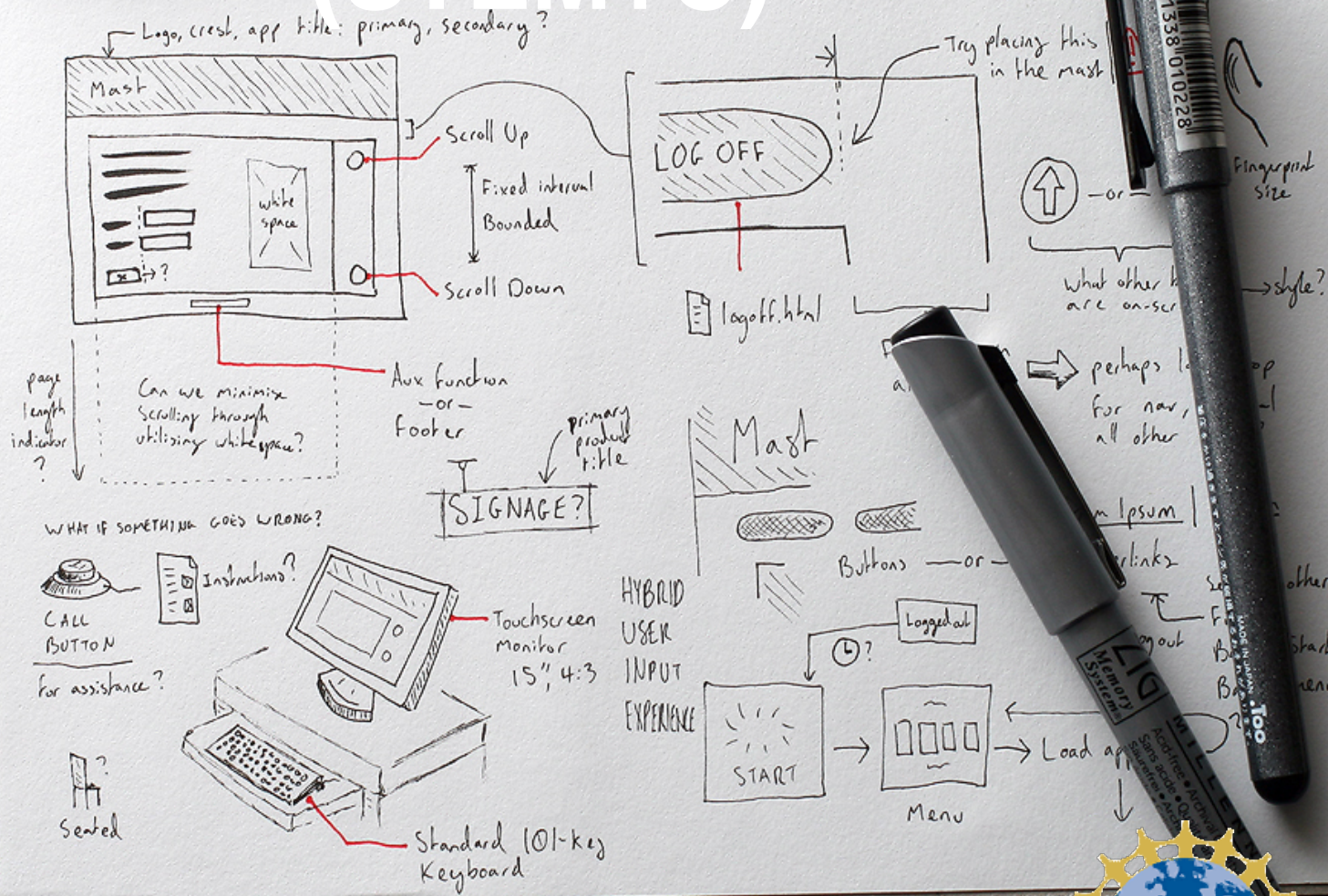
STEM+C Program Overview

- STEM+C is an EHR-CISE partnership for computing education
- Can take place in informal and/or formal learning settings
- **Emphasis on broadening participation in computing.**
- Advance the evidence-based foundation to support the education and professional development of K12 teachers & students in computing and the integration of computing into STEM disciplines
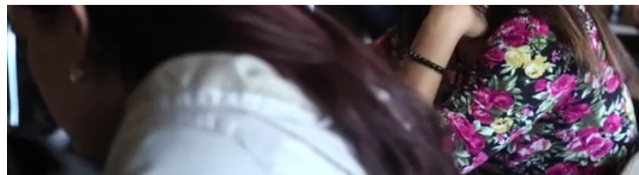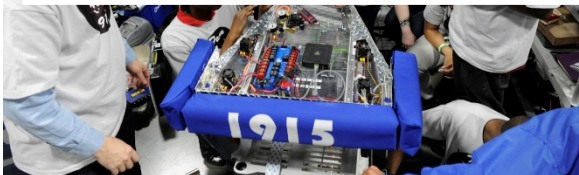
STEM+C Solicitation (16-527)

- Supports several types of projects: Exploratory Integration; Design & Development; Workshops/conferences

- Emphasis on diversity and broadening participation; Research on Education and Broadening Participation proposals

- **Proposal Deadline: March 24, 2017**

Anticipated STEM+C Program Funding Amount: $47,000,000

Estimated ITEST Per Project Funding Amount: $250,000 - $2,500,000

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)

Anticipated ITEST Program Funding Amount: $50,000,000

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

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

- **Proposal Deadline: December 5, 2016**

- Resource Center: Cadre, www.cadrek12.org

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

Advanced Technological Education (ATE,14-577)

Anticipated ITEST Program Funding Amount: $50,000,000

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

- Supports projects focused on program development and improvement, curriculum and educational materials development, professional development for educators, leadership capacity building for faculty, teacher preparation, business and entrepreneurial skills development for students, small grants for institutions new to the ATE program, conferences and workshops, ATE coordination networks

- **Emphasis on broadening participation**

- **Proposal Deadline: October 6, 2016**

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

NSF Directorate for Education and Human Resources (EHR)

Division of Human Resource Development (HRD)

HRD Programs

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

- **Alliances for Graduate Education and the Professoriate (AGEP)**

- **Centers of Research Excellence in Science and Technology (CREST)**

- **Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)**

- **Louis Stokes Alliances for Minority Participation (LSAMP)**

- **Tribal Colleges and Universities Program (TCUP)**

ADVANCE

▸ Supports institutional change projects that increase the representation and advancement of women STEM careers in higher education

▸ Promotes innovative and sustainable strategies to foster gender equity in higher education

▸ Contributes to the research base on gender equity and the intersection of gender and other identities in STEM academic careers

▸ New solicitation due summer 2016

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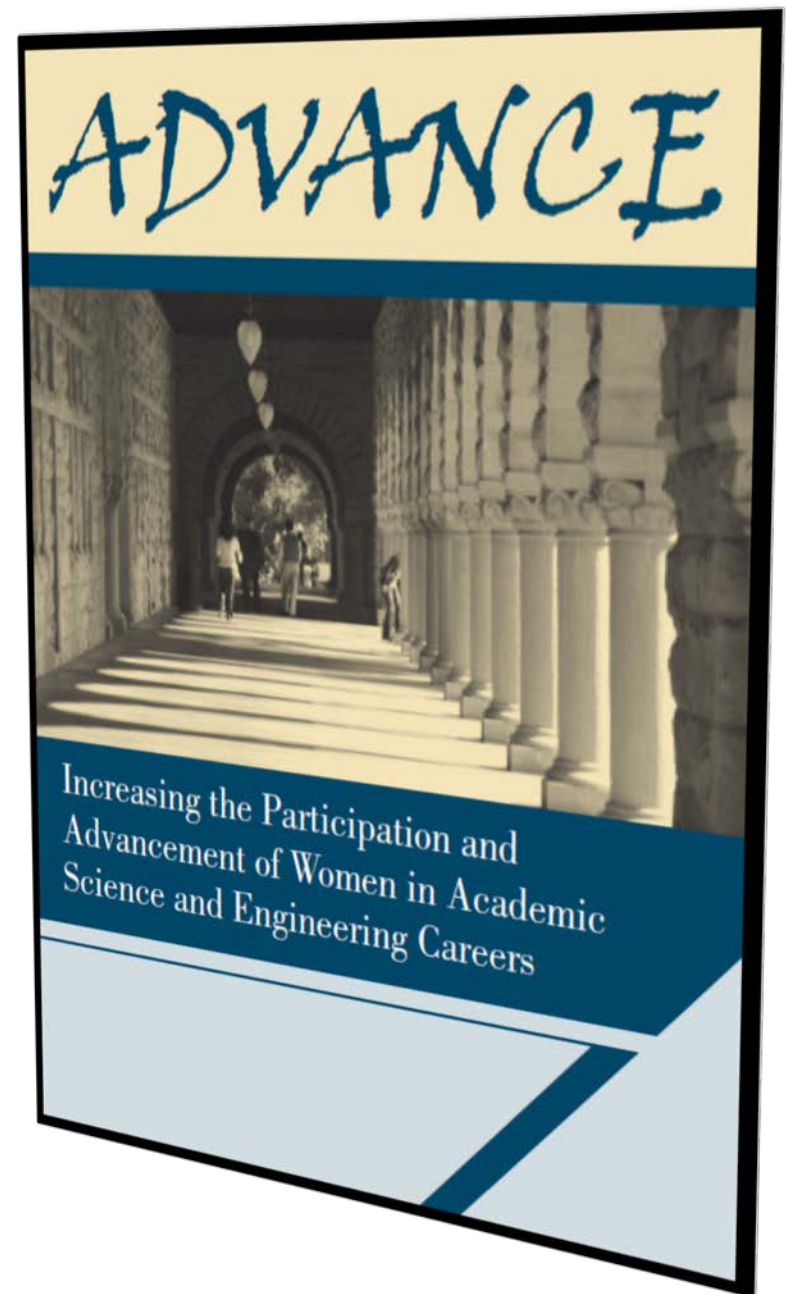
Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers

Alliances for Graduate Education and the Professoriate (AGEP)

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

- The AGEP program goal is to increase the number of historically underrepresented minority faculty, in STEM and STEM education research, by advancing knowledge about pathways to career success.

- AGEP Alliances develop or replicate/reproduce, implement, study, disseminate and sustain innovative models to advance dissertators, postdoctoral fellows and faculty.

Alliances for Graduate Education and the Professoriate (AGEP)

PROGRAM SOLICITATION
NSF 16-552

REPLACES DOCUMENT(S):
NSF 14-505

National Science Foundation

Directorate for Education & Human Resources
Division of Human Resource Development

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

June 14, 2016

December 09, 2016

Second Friday in December, Annually Thereafter

<u>Program Contacts</u>
Mark Leddy, Program Director: 703-292-4655/mleddy@nsf.gov
Maurice Dues, Program Specialist: 703-292-7311/mdues@nsf.gov

Centers of Research Excellence in Science and Technology (CREST)

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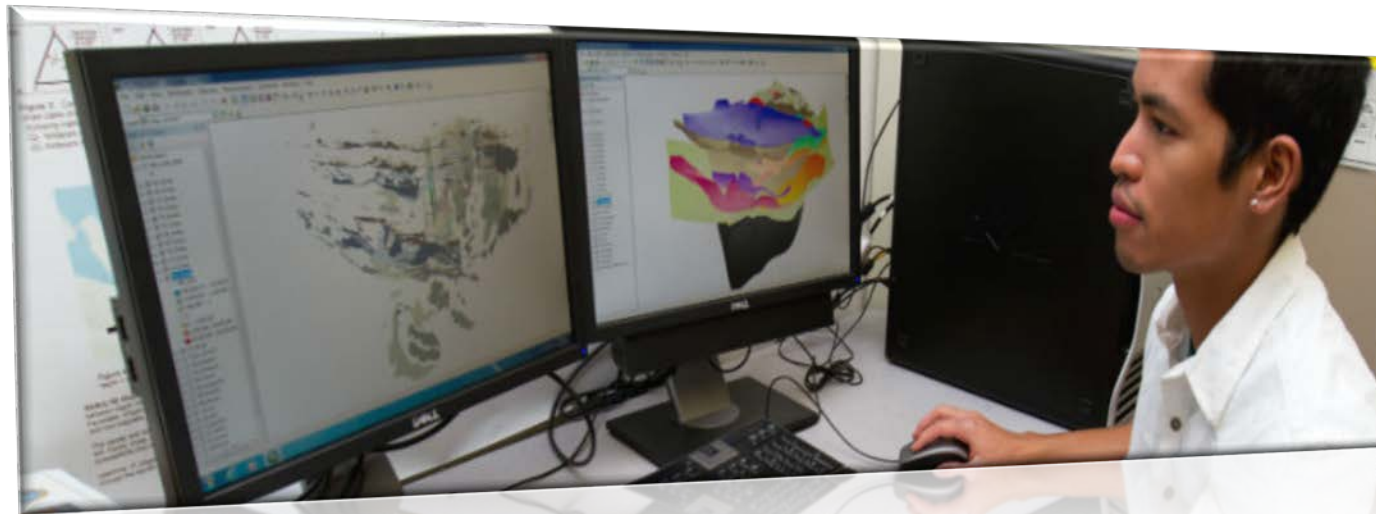
CREST project – California State University, Bakersfield For the study of 21st century water resources and subsurface carbon storage in the San Joaquin Valley.

CREST Calendar

Dec 2, 2016 – HBCU-RISE LOI

Dec 2, 2016 – Postdoc Research Fellowship

Feb 10, 2017 - CREST Center & HBCU-RISE Proposals

Feb 13, 2017 – CREST Partnership Supplements

CREST program solicitation: NSF 16-525
Additional Information: CRESTWeb (www.crestweb.org)

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.

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

- ## PROGRAM SOLICITATION NSF 16-538

Letter of Intent Due Dates:

- July 26, 2016   Research Initiation Awards
- September 06, 2016   Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects

Preliminary Proposal Due Date:

- March 21, 2016 Broadening Participation Research Centers

Full Proposal Deadlines:

- October 04, 2016   Research Initiation Awards
- November 22, 2016 Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects
- November 22, 2017   Broadening Participation Research Centers

Contact:

Claudia Rankins crankins@nsf.gov

Andrea Johnson andjohns@nsf.gov

Earnestine Easter espalmon@nsf.gov

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.

.

LSAMP Alliance Award Types

Alliances (different institutional types)

- Multi-institutional partnerships that implement comprehensive, evidence-based, innovative, and sustained strategies to support students from underrepresented racial and ethnic groups at the baccalaureate level

- 5-year projects focused on undergraduate recruitment and retention activities

Bridge to the Doctorate (BD) Activity

- Eligible only to existing alliances funded more than 10 consecutive years to host a BD activity at one of its alliance institutions

- 2-year projects focused on providing post-baccalaureate fellowship support to a cohort of 12 LSAMP students for the first two years of their STEM graduate studies

Bridge to the Baccalaureate (B2B) Alliances

- Partnerships between primarily 2-year institutions with a community college as lead institution

- 3-year projects focused on activities that provide effective educational preparation of community college students for successful transfer to 4-year institutions in STEM.

Pre-Alliance Planning Grants

- Up to 18-month projects that undertake planning activities necessary to form new alliances or regional outreach and knowledge-diffusion centers of excellence

See the LSAMP Solicitation, NSF 15-594

Tribal Colleges and Universities Program (TCUP)

2015 Cohort: Tribal College Librarians Institute (founded in 1989 by Montana State University).

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.

Solicitation 16-531

Getting Started on Writing a Proposal

- Start early and set realistic goals
- Become acquainted with FASTLANE (www.FastLane.nsf.org)
- Read the "Program Announcement or Description or Dear Colleague Letter or Solicitation" and follow the guidelines
- Contact a program officer to discuss your idea (but only after you have read the program announcement or solicitation)
- Read and follow the Proposal and Award Policies and Procedures Guide (PAPPG) which contains the Grants Proposal Guide (GPG)
- Become an NSF reviewer

Writing the Proposal

- Follow all guidelines

- Address the merit review criteria

- Take time to complete all required forms

- Choose your collaborators wisely

- Please have someone proofread your proposal

- Look at other projects that have been funded in the program you are submitting to

- Make sure your budget reflects the work proposed

- Don't give up if your proposal does not get funded, consider the feedback reviewers and the program officers give you

Funding Opportunities in the Division of Graduate Education

Earnestine Easter, Program Director
*(epsalmon@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
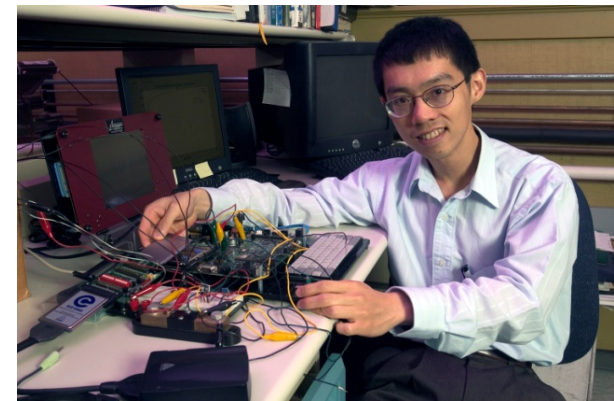
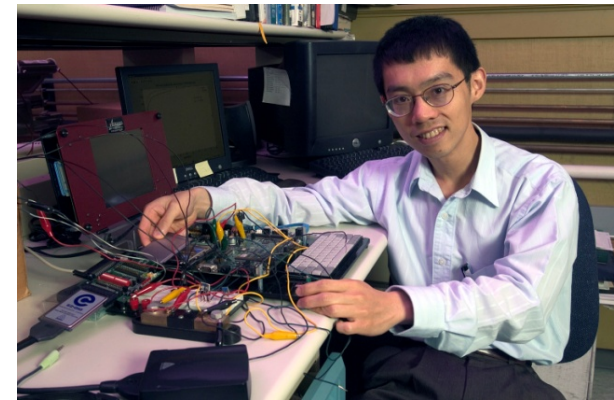# Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

CyberCorps Scholarship for Service

EHR Core Research: Workforce Development

Project and Program Evaluation
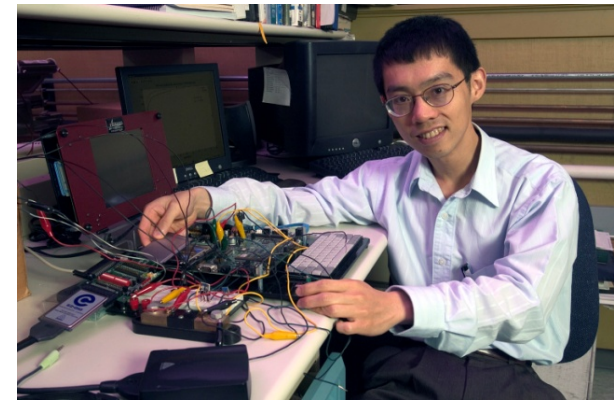
Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

CyberCorps Scholarship for Service

EHR Core Research: Workforce Development

Project and Program Evaluation

NSF Graduate Research Fellowship Program

Goals

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

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

Key Features

Five Year Award – $138,000

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

GRFP Eligibility

- U.S. citizens and permanent residents

- Early-career: undergrad & grad students

- Pursuing research-based MS and PhD

- Science and Engineering

- Enrolled in accredited institution in US by Fall

Academic Levels

- **1:** Seniors/baccalaureates; no graduate study

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

- **3:** Second-year grad students
  - ≤ 12 months of graduate study by August

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

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
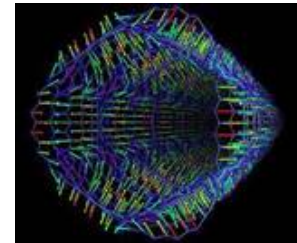
NOT SUPPORTED

- Joint science-professional degree programs
  - e.g. **MD/PhD**, JD/PhD
- Business administration or management
- Counseling, Social work
- Education (except in science and engineering education)
- History (except in history of science)
- **Research with 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 2016 (received by 8 pm EST)

Refer to Solicitation NSF 16-588

Graduate Research Internship Program

Fellows conduct mission-related, collaborative research projects at federal facilities and national laboratories.

Partner Agencies

Department of Homeland Security

Environmental Protection Agency

Federal Bureau of Investigation

National Oceanic and Atmospheric Administration

Office of Naval Research

Smithsonian Institution

U.S. Census Bureau

U.S. Geological Survey

Graduate Research Opportunities Worldwide

Fellows engage in **research collaborations** with investigators in partner countries through agreements between NSF and counterpart agencies.

Partner Countries

Australia	Finland	Japan	Norway
Austria	France	Korea	Singapore
Brazil	India	**Mexico**	Sweden
Chile	Ireland	Netherlands	Switzerland
Denmark			

What are the Benefits to Fellows?

GROW — NSF Graduate Research Opportunities Worldwide

GRIP — NSF Graduate Research Internship Program

- $5,000 Travel allowance
- Additional in-country support from partner agency

- $5,000 Research allowance
- Additional research support from partner agency

- Access to facilities, data, equipment, field sites
- New collaborations and expanded network
- Skill development and exposure to different cultures (both international and domestic)

Promoting GRFP on Campus

- Publicize GRFP on campus: focus on domestic students, undergrads and beginning grad students

- Identify faculty willing to mentor applicants
  - *Encourage faculty to register to serve as reviewers for GRFP*

- Hold workshops/courses
  - *Find faculty advisors and Fellows willing to participate*

- Utilize GRFP's web resources

- Reach out to GRFP Resource People on www.nsfgrfp.org

- Partner/engage with Honors College, REU Site Coordinators
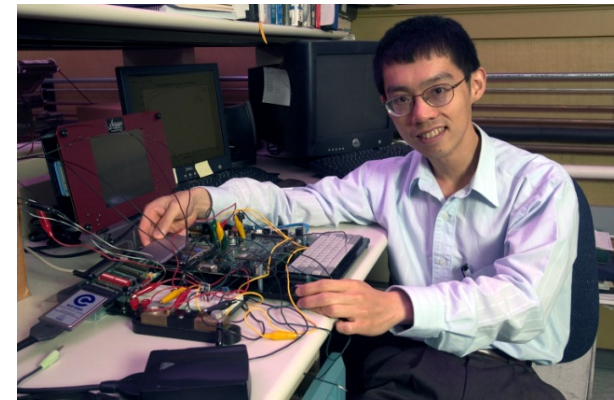
Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

CyberCorps Scholarship for Service

EHR Core Research: Workforce Development
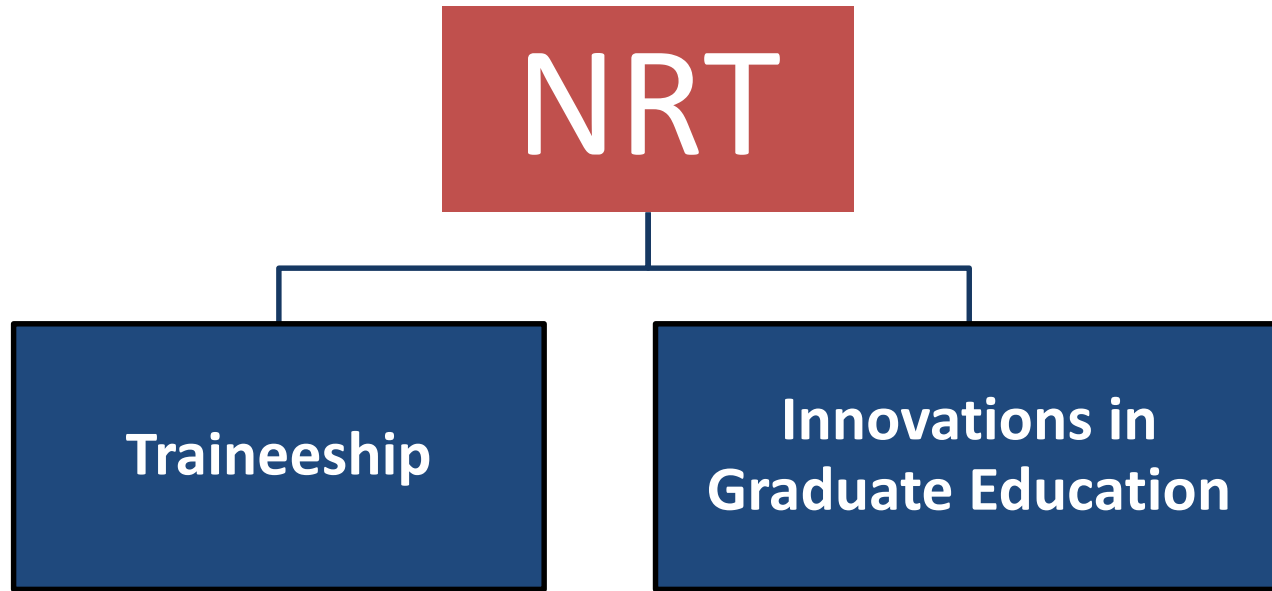
Project and Program Evaluation

NSF Research Traineeship (NRT) Program

NSF 16-503
Research and Capacity Building & Student Support

NRT

Traineeship

Innovations in Graduate Education

2016 Deadlines

Letter of Intent: **December 09, 2015**

Full Proposal: **February 09, 2016**

2017 Deadlines

Letter of Intent: **December 09, 2016**

Full Proposal: **February 07, 2017**

How Do the Tracks Differ?

	Traineeship Track	IGE Track
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 2017 *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**)

- Other Crosscutting, Interdisciplinary Themes

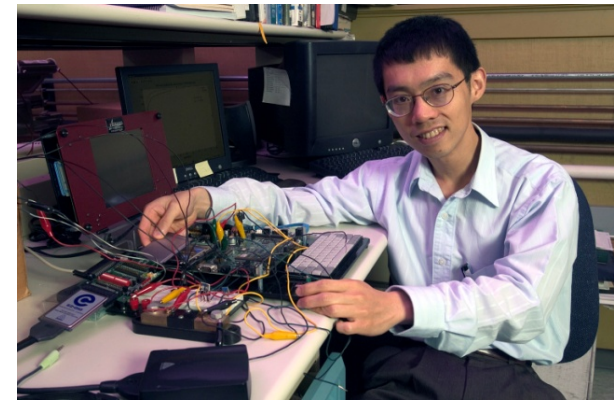# Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

CyberCorps Scholarship for Service

EHR Core Research: Workforce Development

Project and Program Evaluation

CyberCorps®
Scholarship for Service ([SFS](#)) NSF 15-584

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

Capacity Track: September 1-15, 2016
Scholarship Track: December 1-15, 2016

CyberCorps®: Scholarship for Service (SFS)

Scholarship Track

$1-5M/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 (must 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.

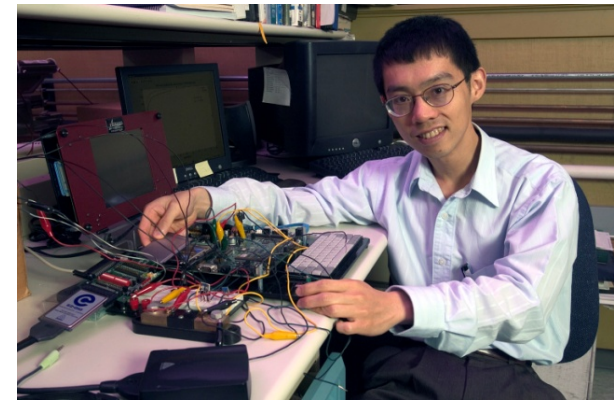# Division of Graduate Education Portfolio

Graduate Research Fellowship Program	NSF Research Traineeship Program	CyberCorps Scholarship for Service

| EHR Core Research: Workforce Development	Project and Program Evaluation

ECR Program Goals

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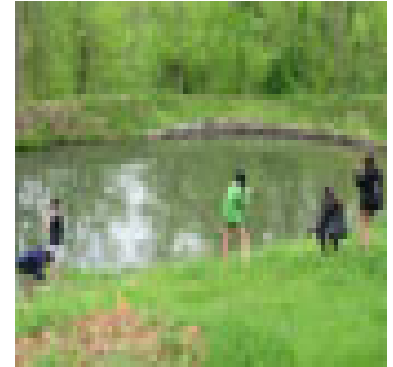- Broadening Participation and Institutional Capacity
- STEM Professional Workforce Development
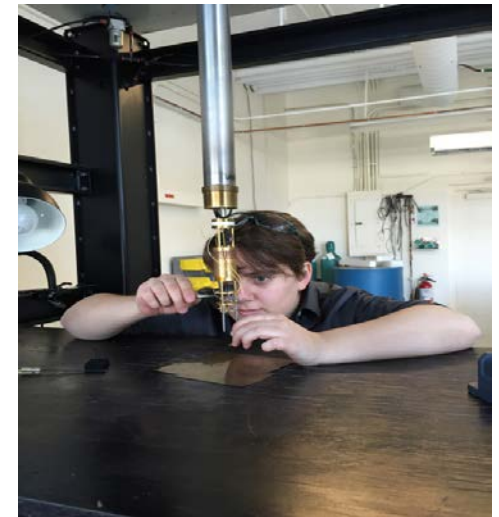
STEM Learning and Learning Environments

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

➢ Implications of labor market trends on STEM education and training
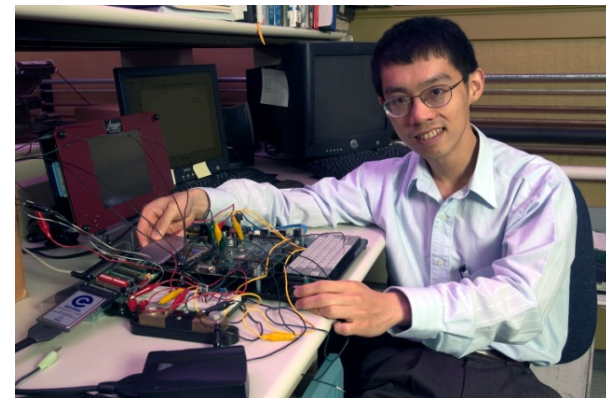
Sample Workforce Development Projects

- 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: Second Thursday in September Annually

NSF Priority Goal: FY16-17
STEM Graduate Student Preparedness

Supplements to Existing Awards

– Enhanced experiences: single/collaborative awardees for existing graduate students to acquire professional development experience

– Enhanced activities: available to larger "center-like" activities to support cohorts of graduate students with the goal of developing new "best practice activities" for enhancing graduate student preparedness.

Summer Institutes

– Proposed convincing theory or evidence-based strategies for providing students with professional development in areas that have been identified as being essential to workforce preparedness.

"Dear Colleague Letter"   NSF 16-067

Representing DUE Programs Today

Gül Kremer   Olga Pierrakos

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

National Science Foundation
Division of Undergraduate Education (DUE)

DUE's Mission:

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

Potentially Tra**ormative Education R&D**

Tra NSF ormative 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)
  - Scholarships in Science, Technology, Engineering, and Mathematics Education (S-STEM)
  - Improving Undergraduate STEM Education (IUSE:EHR)
- **EHR-Wide Program**
  - Innovation Corps for Learning (I-Corps L)
- **Cross-Directorate Programs**
  - IUSE PFE/Revolutionizing Engineering & CS Departments (RED)
  - Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES)
  - CAREER

Advanced Technological Education (ATE) Program

Launched in 1993 in response to Scientific and Advanced-Technology Act of 1992

- FOCUS: **Education of science and engineering technicians** for **high-technology fields that drive the nation's economy**
- ATE Projects, ATE Centers & Targeted Research on Technician Education

Education/Industry partnerships are a hallmark of ATE

- **Community and technical colleges *must be* in leadership roles**
- Grades 7-12, two-year, and four-year institutions (**pathways**)

**Deadline:
October 6, 2016**

# S-STEM Program

Two Program Tracks

Institutional Capacity Building (Strand 1)
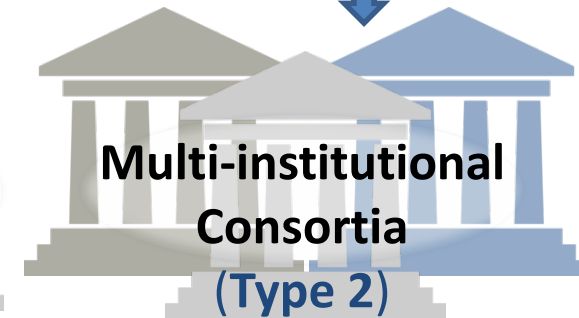
Up to $650K
Up to 5 yrs

For institutions with no prior S-STEM or STEP funding; limited experience in implementing effective curricular and co-curricular activities

Design and Development (Strand 2)

Two Types

Single Institution (Type 1)

Up to $1M
Up to 5 yrs

Multi-institutional Consortia (Type 2)
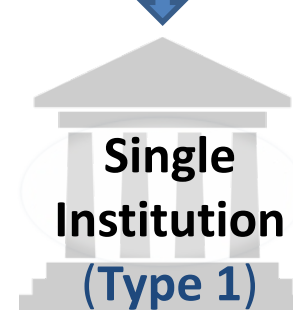
Up to $5M
Up to 5 yrs

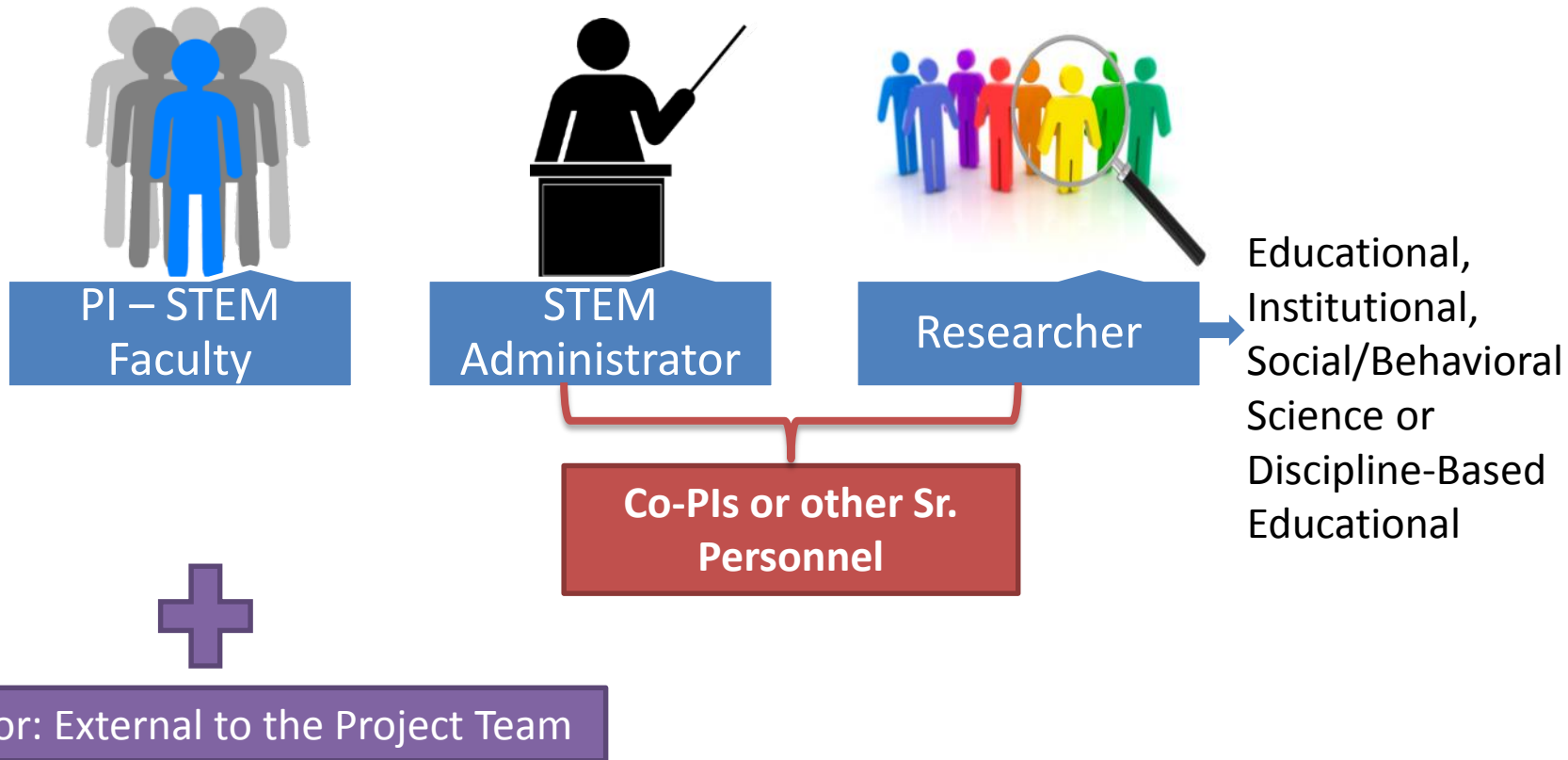*Seeks to leverage S-STEM funds with institutional efforts and infrastructure to increase and understand impacts*

Deadlines (All Proposals):
April 20, 2017
3rd Thursday in April, annually thereafter

S-STEM Team Members

PI – STEM Faculty

STEM Administrator

Researcher → Educational, Institutional, Social/Behavioral Science or Discipline-Based Educational

Co-PIs or other Sr. Personnel

Evaluator: External to the Project Team

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!

Improving Undergraduate STEM Education (IUSE:EHR)

Improve STEM Learning & Learning Environments:
Improve the knowledge base for defining, identifying, and innovating effective undergraduate STEM education teaching and learning for all NSF-supported disciplines, and foster widespread use of evidence-based resources and pedagogies in undergraduate STEM education

Build the Professional STEM Workforce for Tomorrow:
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

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

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

IUSE:EHR Program

Two Program Tracks

Engaged Student Learning

Institutional and Community Transformation

Two Approaches

Two Approaches

Exploration & Design (smaller scale)	Development & Implementation (larger scale)	Exploration & Design (smaller scale)	Development & Implementation (larger scale)
Up to $300K Up to 3 yrs	Level I: Up to $600K Up to 3 yrs Level II: $601K to $2M Up to 5 yrs	Up to $300K Up to 3 yrs	Up to $3M Up to 5 yrs

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

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

Deadlines (Both tracks):
Exploration/Design: <u>November 2, 2016</u>
Development/Implementation: January 11, 2017

Robert Noyce Teacher Scholarship Program

Track 1: S&S

Scholarships & Stipends

Undergraduate STEM majors and/or STEM professionals

Track 2: TF

NSF Teaching Fellowships

STEM professionals

Robert Noyce Teacher Scholarship Program
Solicitation NSF 16-559

Track 3 (MTF)

NSF Master Teaching Fellowships

Exemplary, experienced STEM teachers

Track 4: Noyce Research

Research related to STEM teacher effectiveness, persistence, and retention in high-need LEAs

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

DUE Home Page

Final Remarks

- Broadening Participation Across Domains
- Capacity Building & Professional Development

Inclusion across the National of Communities of Learners of Under-represented Discoverers in Engineering and Science (NSF INCLUDES, 16-544)

INCLUDES is a comprehensive national initiative designed to enhance U.S. leadership in science, technology, engineering and mathematics (STEM) discoveries and innovations focused on NSF's commitment to diversity, inclusion, and broadening participation in these fields.

Design and Development Launch Pilots – Proposals were due June 24, 2016

NSF INCLUDES National Network

	FY16	FY17	FY18 and beyond
Design and Development Launch Pilots	2 year awards @ $300K (30-40 awards)	2 year awards @ $300K	2 year awards @ $300K
Alliances		5 year awards @ $12.5M (3-5 awards)	5 year awards @ $12.5M
Backbone Organizations	Conferences and Workshops	5 year award(s) @ $3.5M	5 year awards @ $3.5M
Other Activities	PI Meeting Evaluation & Assessment	Linkages BP Portfolio Evaluation & Assessment	Linkages BP Portfolio Evaluation & Assessment

BP Coordination Across Various Domains

EHR/NSF-Wide Initiatives (ex. INCLUDES)

NSF Broadening Participation Website

NSF Days

Institutions
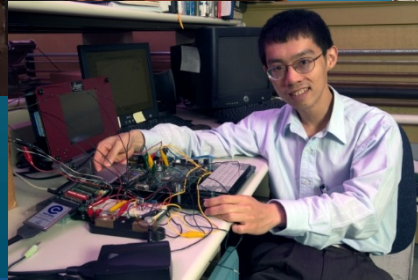
Principal Investigators

Reviewers

Rotators

Capacity Building & Professional Development

- NSF Summer Scholars Internship Program (HACU, QEM, WINS)

  - Serve as a Proposal Reviewer/Panelist

  - Become an NSF Program Officer

- Consider other NSF positions (DD, DDD, etc.)

NSF Opportunities
Broadening Participation in STEM

Directorate for Education and Human Resources (EHR)