National Science Foundation
Graduate Education Programs and Priorities

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Northeastern Association of Graduate Schools 2017 Annual Meeting

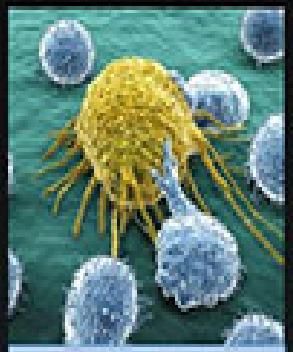
Goals of Session

I. **Provide an Overview** of NSF's current context for graduate education and preparation of the future workforce

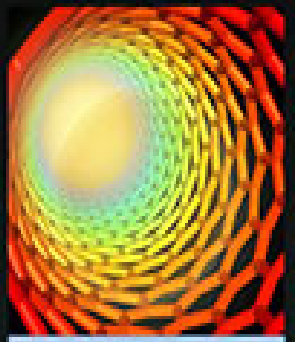
II. **Highlight** NSF and Division of Graduation Education programs and emphases on inclusion and engagement

III. **Gather Your Input:** What should NSF be thinking about as we develop new initiatives to support graduate education?

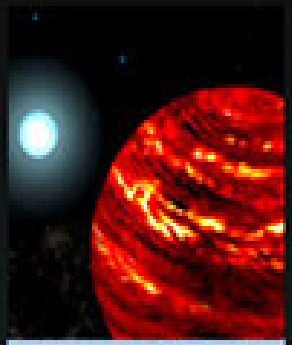
NSF champions research and education across all fields of science and engineering



Biological Sciences



Engineering



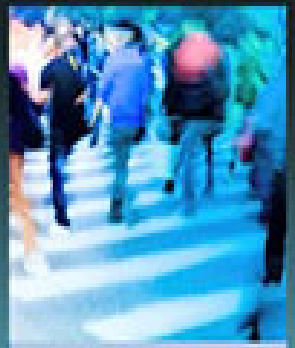
Mathematical & Physical Sciences

Computer & Information Science & Engineering

Geosciences (including Polar Programs)

Integrative Activities

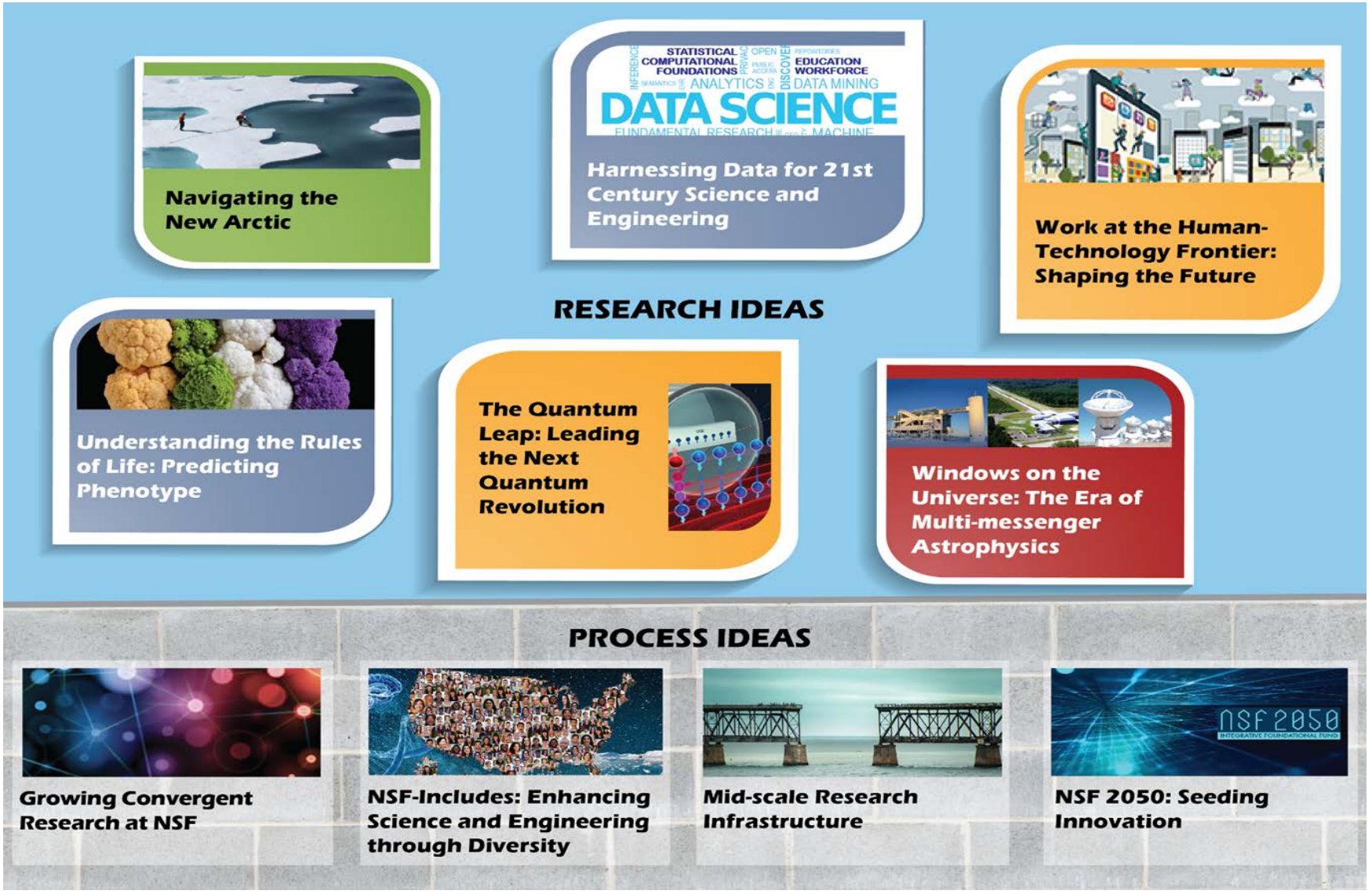
Education & Human Resources



Social, Behavioral & Economic Sciences

International Science & Engineering

NSF's Big Ideas for Future Investment



Goals for NSF Investments in Graduate Education

Strategic Framework for Investments in Graduate Education (FY2016-FY2020)

- **Advance Science and Engineering (S&E) Research:** Support graduate students and graduate education to enable long-term contributions of new knowledge at the frontiers of science and engineering.

- **Broaden Participation to Promote Excellence in Research and Build the Next Generation STEM Workforce:** Recruit graduate students from a variety of geographic, demographic, social, and educational backgrounds to promote the advancement of science and a highly qualified professional workforce

- **Build Effective Models of Graduate Education and Workforce Development:** Support the development and use of innovative models and evidence based approaches in graduate education, including education and research about promising practices and program effectiveness.

NSF Priority Goal: FY16-17

STEM Graduate Student Preparedness

Goal Statement

To provide multiple opportunities for science and engineering doctoral students to acquire the knowledge, experience, and skills needed for highly productive careers, inside and outside of academe.

- Encourage enhanced mentoring of skills beyond those needed in academia;
- Encourage theory and/or evidence-based strategies to enhance and expand training in essential professional skills;
- Enhance interdisciplinary training and collaborations through development of activities that encourage graduate student preparedness for entering the workforce.

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.

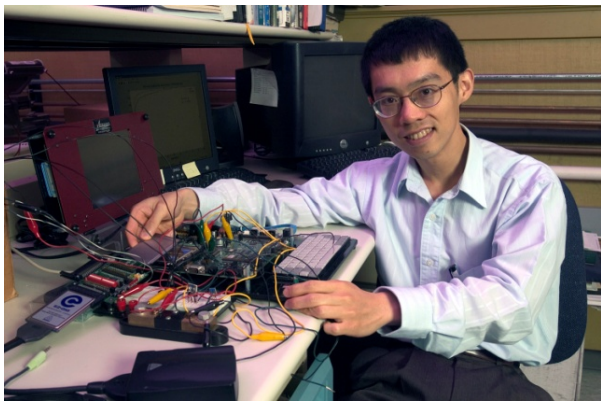
Summer Institutes

- 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" (DCL) deadlines vary by directorate with most April/May 2017

II. 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



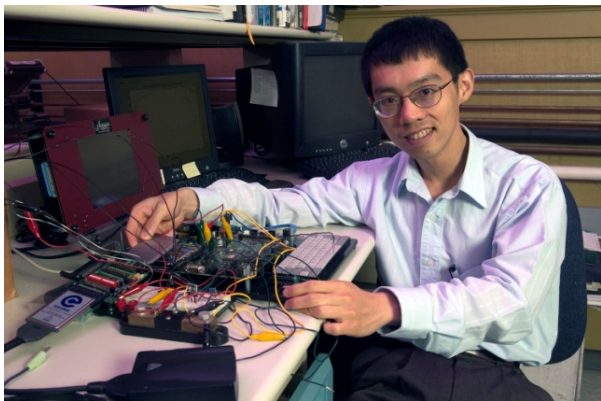
Division of Graduate Education Portfolio

Graduate Research Fellowship Program

NSF Research Traineeship Program

CyberCorps Scholarship for Service

EHR Core Research: Workforce Development



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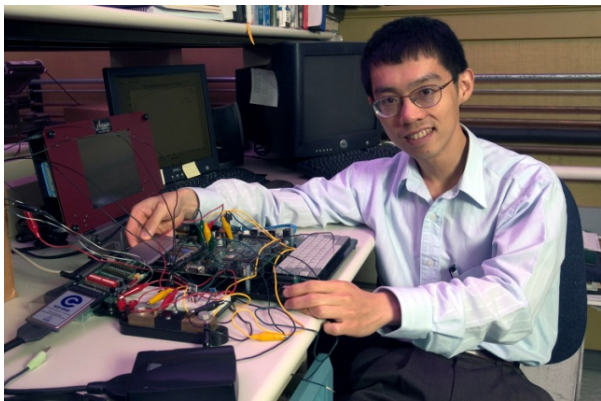


Goals of GRFP

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

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:

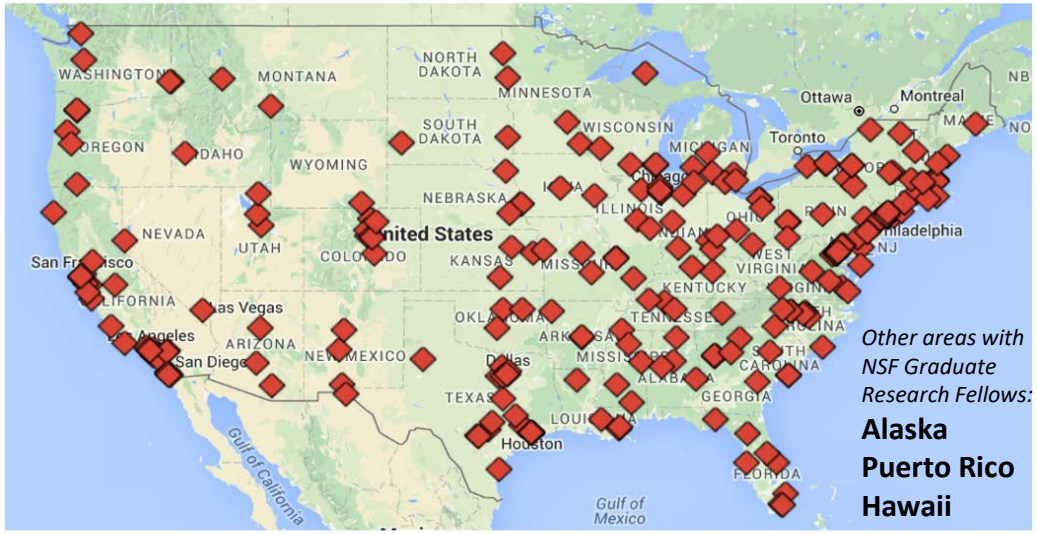
GROW: International Research

GRIP: Federal Internships

NSF budget for GRFP ~$330 M/Yr

GRFP Impact

~ 8,340 NSF Graduate Research Fellows are from 488 baccalaureate institutions and conduct research towards their master's or doctoral degree at 220 graduate schools



NSF GRFP impacts every state and territory of the U.S.

GRFP 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

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

with an interruption in graduate study of 2+ years

Graduate Research Internship Program (GRIP)

- GRIP provides **GRFP Fellows** with opportunities to develop their professional skills and networks
- Fellows conduct mission-related, collaborative research projects at federal facilities and national laboratories

NSF 16-015 Dear Colleague Letter: www.nsf.gov/grip

Current Partners

- Office of Naval Research
- Smithsonian Institution
- Department of Homeland Security
- Federal Bureau of Investigation
- Environmental Protection Agency
- National Oceanic & Atmospheric Administration
- U.S. Census Bureau
- U.S. Geological Survey
- U.S. Dept. of Agriculture

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

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

GRIP
NSF Graduate Research Internship Program

- $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)

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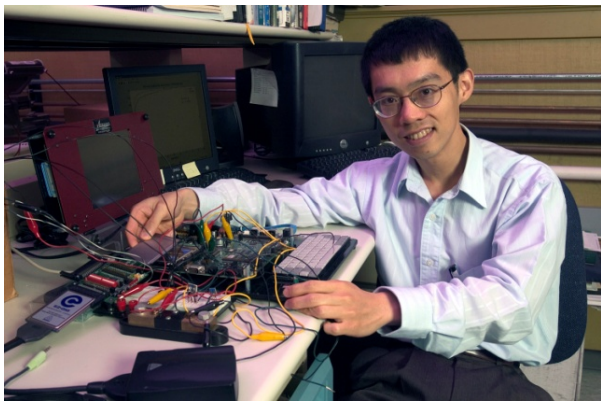
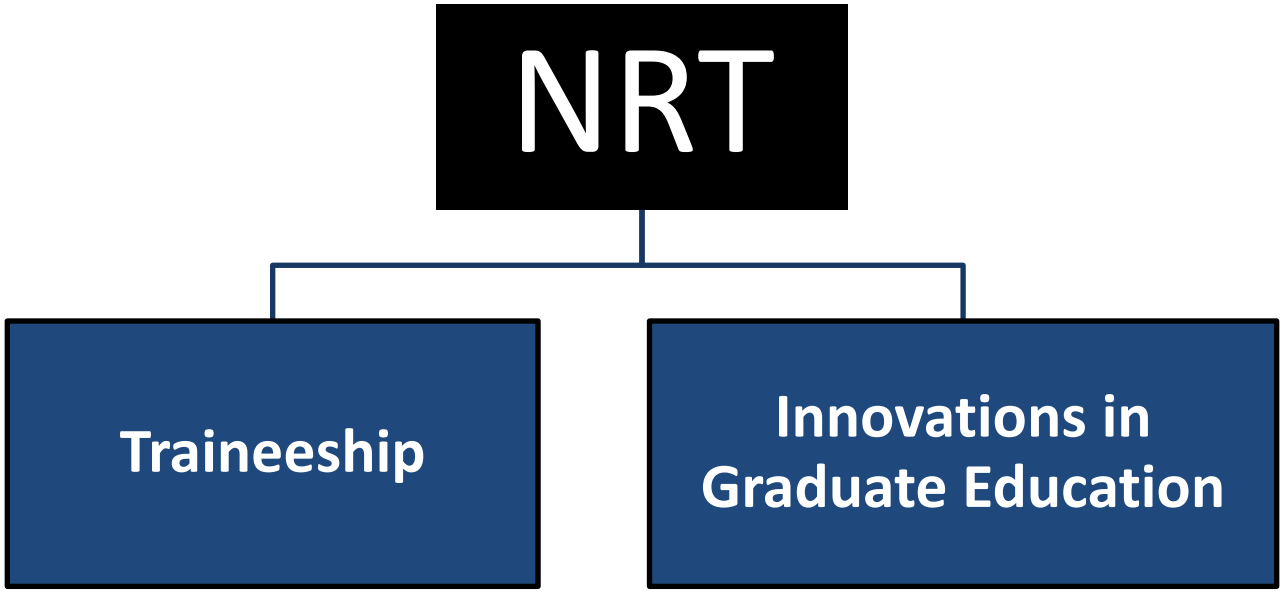


NSF Research Traineeship (NRT) Program

NSF 16-503

Research and Capacity Building & Student Support



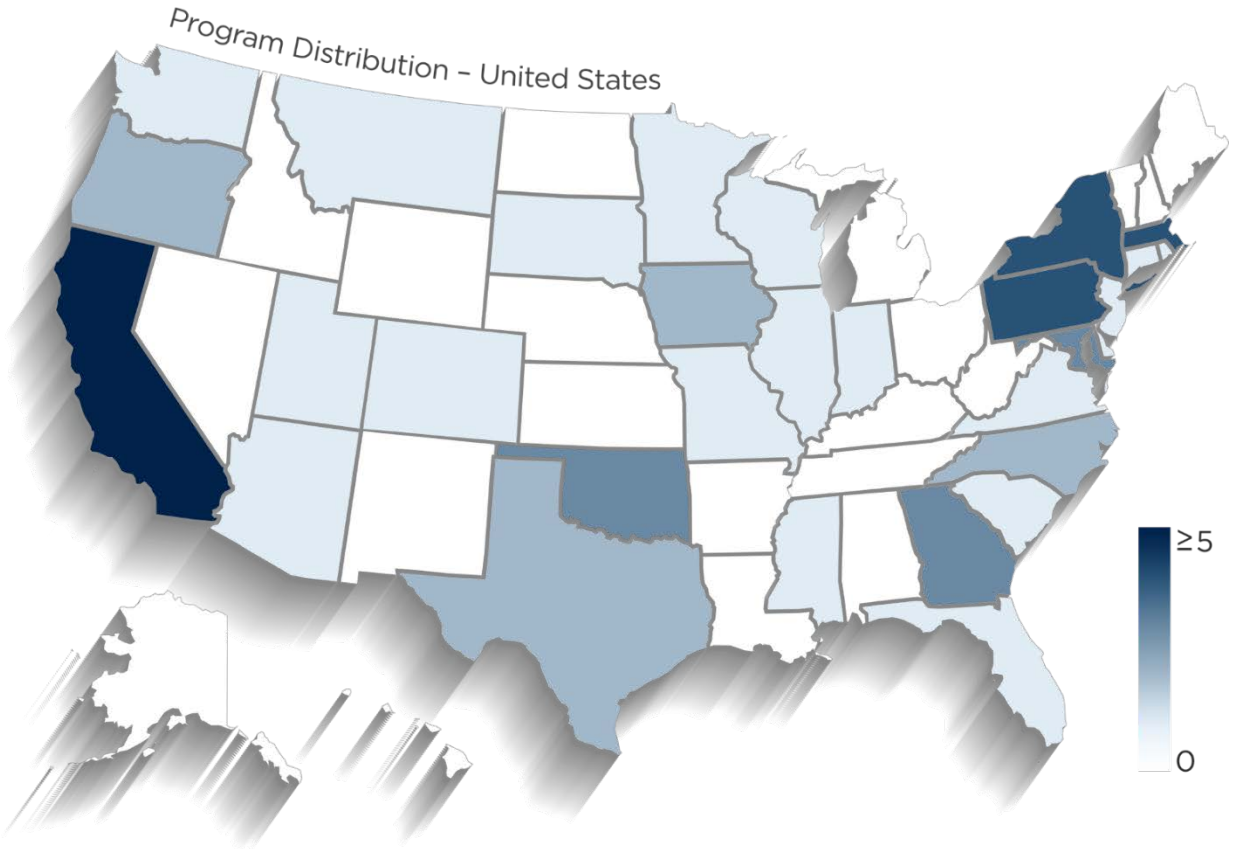
How Do the Tracks Differ?

	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

NSF Research Traineeship (NRT) Program



NRT Portfolio

- 57 projects
  - 34 Traineeship
  - 23 IGE
- 29 states
  - 22% projects in EPSCoR states
- Institutions
  - 11% MSIs
  - ≥17% non-R1

NSF Research Traineeship (NRT) Program

TRAINEESHIP TRACK HIGH PRIORITY RESEARCH AREAS

Priority Area	2014	2015	2016	2017
DESE				
INFEWS				
UtB				

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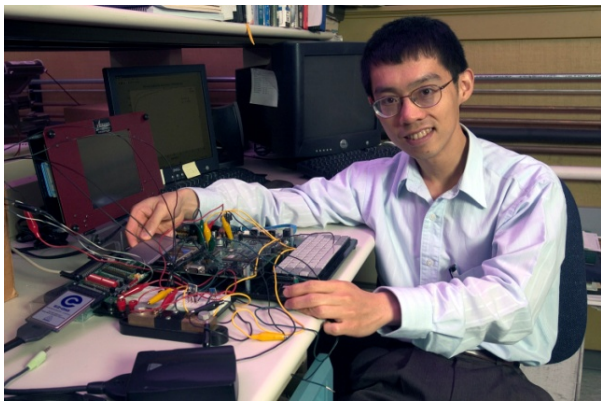


NSF CyberCorps®: Scholarship for Service (SFS) Program

GOALS

- Increase the number of qualified employees working for Federal, State, Local, and Tribal governments in cybersecurity
- Increase the capacity of US education enterprise to produce professionals in cybersecurity

ELIGIBILITY

- Institution: National CAE/IAE designation or offers coherent formal cybersecurity program
- Student: US citizen or Permanent Resident, enrolled in cybersecurity program (full time)

NSF CyberCorps®: Scholarship for Service (SFS) Program

SUPPORT

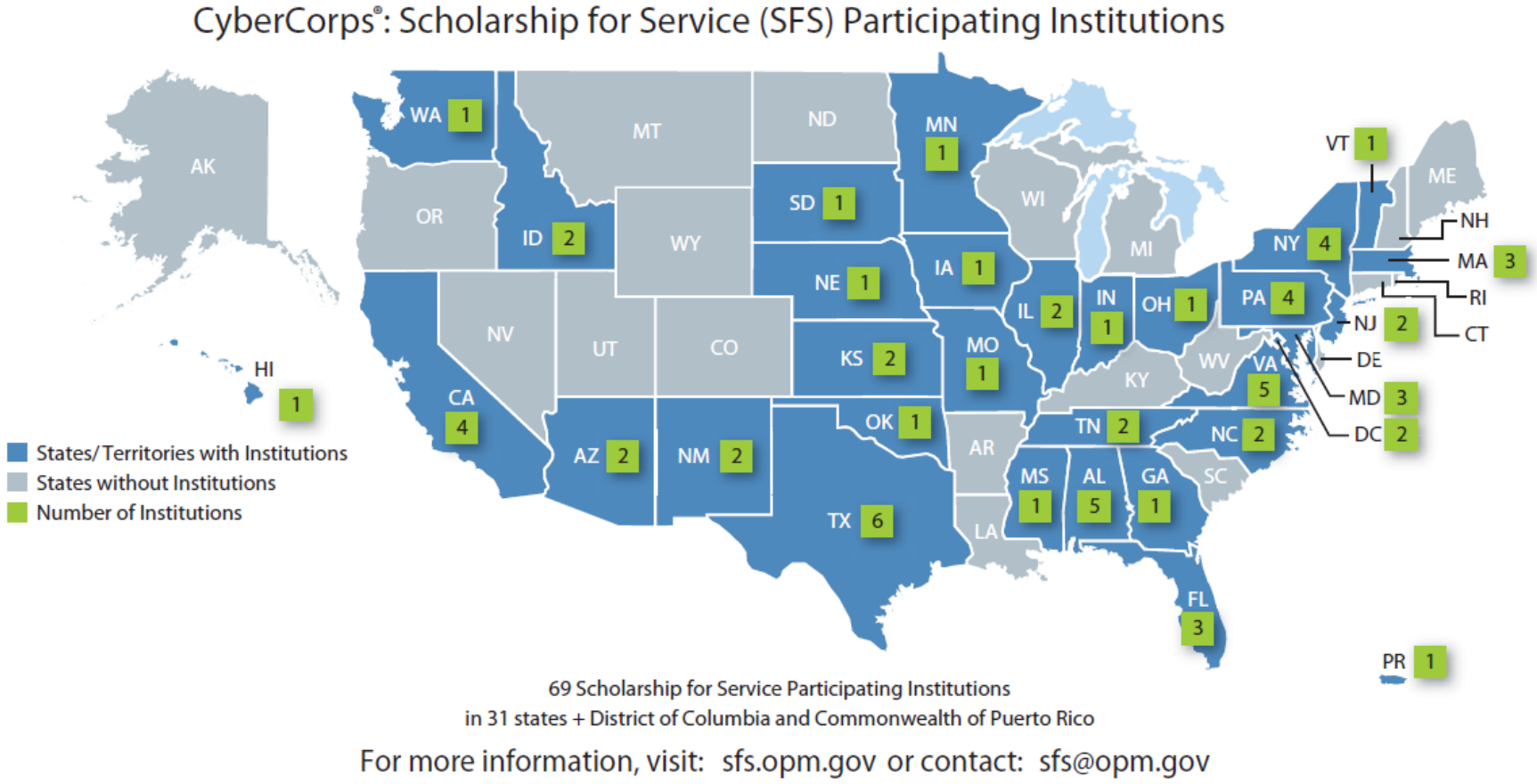
- Full tuition, stipend ($22.5K/$34K per year), and fees/insurance/allowance (up to $9K per year), up to 3 years
- Summer internship, JobFair, post-graduation service requirement (work in government positions equal to scholarship length)

IMPACT

- 2900 SFS scholarship recipients (since 2001)
- B.S. (22%), M.S. (75%), Ph.D. (2%), B.S./M.S. (1%)
- Female (25%), data collection since 2013
- Overall placement rate ➔

94%

NSF CyberCorps®: Scholarship for Service (SFS) Program



69 Scholarship for Service Participating Institutions
in 31 states + District of Columbia and Commonwealth of Puerto Rico

For more information, visit: sfs.opm.gov or contact: sfs@opm.gov

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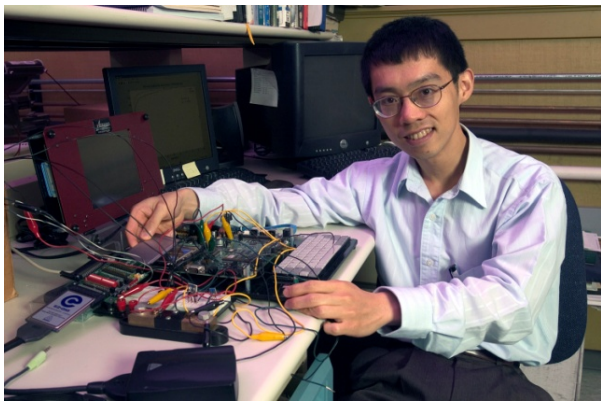
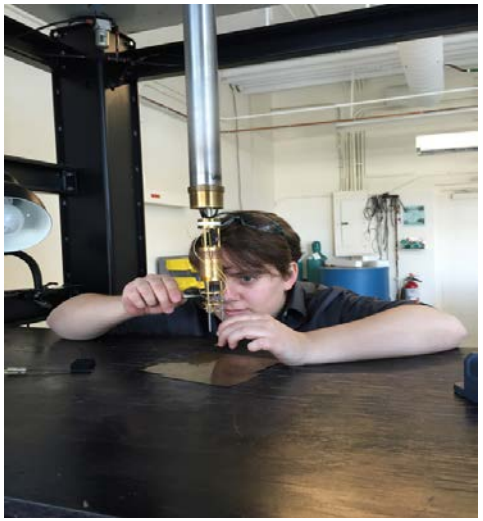


ECR Program Goals

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

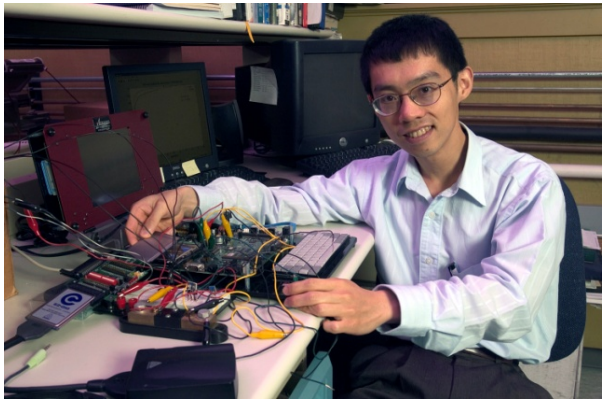


Program Strands

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

STEM Professional Workforce Development

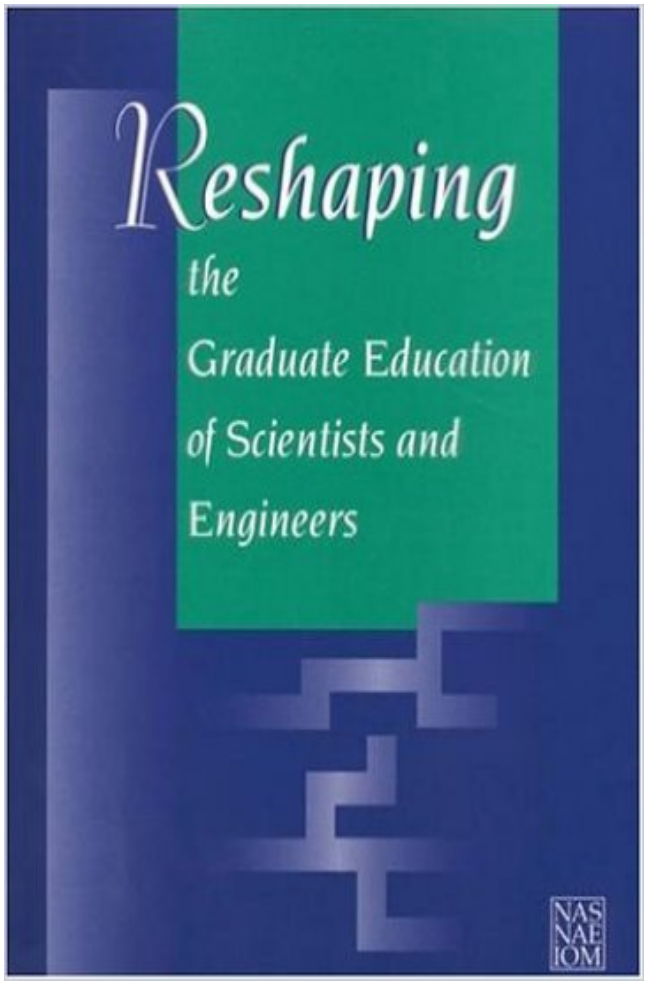
- Impact of different funding models on student preparation
- Persistence in STEM majors and careers
- Influence of public/private partnerships on workforce preparation
- Implications of labor market trends on STEM education and training



NSF Major Investments FY 2016-2017

- NSF Inclusion across the Nation of Communities of Learners that have been Underrepresented for Diversity in Engineering and Science **(INCLUDES)**
- Innovations at the Nexus of Food, Energy, and Water Systems **(INFEWS)**
- Understanding the Brain **(UtB)**
- Risk and Resilience
- CyberCorps: Scholarship for Service **(SFS)**
- Graduate Research Fellowship Program
- NSF Innovation Corps **(I-Corps)**
- NSF Research Traineeship **(NRT)**

Revitalizing Graduate Education (New)



"American graduate schools have done a superb job of preparing young scientists and engineers to become original researchers—to become the scientific and technical leaders of the nation. *It is the purpose of this report to examine how well graduate school prepares students to integrate and disseminate their knowledge and apply it to the full range of present societal needs."*

NAS 1995

III. Your Input

What should NSF be thinking about as we improve our programs and develop new initiatives to support graduate education?

Thank you!