

1. NSF: Role in graduate education (handout)

Due to changing workforce and desired skill set-need for educ reform
Idea is to transform STEM education

Traineeship Models:

Current program: **IGERT** (last application deadline Feb-will close in 3-4 years)-

Integrative grad education and research traineeship-idea was to train at the boundaries of disciplines. Ran from 1998-2013, 7102 students, 122 institutions

Piloting new program, **INSPIRE**—integrated NSF support promoting interdisciplinary research and education (multiple PIs)

Track 1 is up to \$1.5M (expect to fund 40-50/year)

Track 2 is up to \$3M (expect to fund 10/year)

Director's Award—1 PI and up to \$1.5M

Graduate Research Fellowship Program, GRFP-beginning grad students with high potential, and enhance women in engineering and science careers (handout)

Professional development and international opportunities:

Graduate research opportunities worldwide (GROW) www.nsf.gov/grow

First fellows awarded Feb 2013: 12,000 application-funded 2,000

Offers 3-12 month stays to grad research fellows in host countries (Denmark, Finland, Japan, Sweden, France, Norway, Singapore, S. Korea; others joining)

New NSF Directorate: develop research core around education programs

Foundational research areas that are broad, essential, enduring

Program will build, expand research foundations in core areas: STEM learning, STEM learning environments, workforce development, broadening participation in STEM (pipelines/pathways; teaching and learning methods and outcomes; career preparation and transitions; institutional culture, climate; sustainability (globalization, integration research/education; societal impact).

1. NIH biomedical workforce report 2012 http://acd.od.nih.gov/bmw_report.pdf

2. ACS advancing grad education in chemical sciences 2012 http://portal.acs.org/PublicWebSite/about/governance/CNBP_031603

2. ETS/ TOEFL exams

1. new biometric voice ID software (voice prints to validate test takes)-global in 2013

2. help with international student recruitment www.toeflgoanywhere.org

ETS/ LikeLive™ - online video interviews-applicant answers questions via video

www.LikeLive.com

-can video personal statement, recorded asynchronously, or answer set questions in a set time

-can use to screen before a face-to-face interview

-for applicants who are international/location challenged

-admissions/faculty can use this to request videos

-cost is based on video volume—will work with school to do a trial year (only charged normally for inbound at \$15 per for 100, less if more; outbound videos are unlimited and free)

Selected NSF Funding Opportunities: Helping Graduate Students Prepare for Careers

- **Primary Funding Mechanisms**
 - Fellowships- GRFP (see following pages)
 - Traineeships- IGERT (see following pages)
 - Research Assistantships- Grants to PIs and NSF Centers

- **Professional Development and International Opportunities**
 - Graduate Research Opportunities Worldwide (GROW)
Supplements to GRFP awards
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504876
 - East Asia and Pacific Summer Institutes (EAPSI)
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5284
 - CyberCorps- Scholarship for Service (SFS) related to
Cybersecurity
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5228

- **Industry-related Opportunities**
 - Engineering Innovation Fellows Pilot Program (EIFP)
Internship supplements to GRFP awards
www.nsfefip.asee.org
 - NSF Scholarships in Science, Technology, Engineering and
Mathematics (S-STEM)
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5257

- **Interdisciplinary Research/Innovation**
 - Integrated NSF Support Promoting Interdisciplinary Research
and Education (INSPIRE)
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504852&org=OIA&sel_org=OIA&from=fund
 - Innovation Corps (I-Corps)
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504802&org=NSF

Integrative Research and Graduate Education Traineeships- IGERT

Updates

The challenges facing the nation today demand the creative teamwork of people from multiple disciplines and multiple backgrounds. The IGERT program is positioned to produce the most innovative scientists and engineers of the future by jump-starting transformative interdisciplinary research and using it as the foundation for imaginative graduate education. Prepared for the careers of the 21st century, IGERT graduates enter the workforce ready to make America more competitive in our global economy. Through hands-on innovation and training, they also understand how to apply their research for practical societal benefits.

The IGERT program provides graduate students with exceptional training on transformative interdisciplinary themes, including areas of national priority. About 1,500 graduate students are funded yearly, at \$30K per year plus \$10.5K for the cost of education. Beginning FY 2012, \$200K is available per project for student activities related to innovation and \$200K for international activities. Eighteen new awards to institutions were made for FY 2012.

For the FY 2013 funding cycle, IGERT will grant approximately 6-7 new awards.

- o Each award is made for duration of five years.
- o Maximum funding per award is \$3.5M

Program Highlights

Models/Methods/Tools

Traineeships: Provide highly qualified graduate students in STEM disciplines with interdisciplinary training and professional development opportunities to prepare them to be leaders in their chosen fields.

Collaborations: Each IGERT uses unique sets of collaborations across laboratories, disciplines, departments, colleges and institutions; regions, states, and countries; industry and non-profit organizations. Within the NSF, IGERT in DGE collaborates with other offices and directorates for the requisite expertise and perspectives for graduate education across disciplines.

Innovative Educational Methods: IGERT projects have features such as collaborative mentoring, multi-disciplinary graduate student research teams, laboratory rotations across disciplines, student-led workshops and meetings, intensive summer projects and courses, experiences outside the university, exposure to innovation processes, new curricula (some designed by students), and new doctoral degree programs.

Success/Impacts

Since the program's inception, 296 awards have been made and approximately 7,100 doctoral students have received funding. One-hundred and twenty three lead institutions in 44 states and Puerto Rico have hosted IGERT projects. Short-term successes include multiple student awards and prizes, thousands of student publications, and national recognition for interdisciplinary projects. As of FY 2012, over 2,200 IGERT students have graduated; success in obtaining excellent postdoctoral positions, faculty appointments, and positions in industry and government is widely reported.

(See the summary of the IGERT graduate follow-up report by Abt Associates at: www.abtassociates.com/reports/Abt_1-page_report_summary_May_2010.pdf)

Email: igert@nsf.gov Program Information Website: <http://www.igert.org>



Graduate Research Fellowship Program, GRFP

Initiated in 1952, the National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) is a highly competitive, federal fellowship program. The program goals are to select, recognize, and financially support individuals early in their careers with the demonstrated potential to be high achieving scientists and engineers, and to broaden participation in science and engineering of underrepresented groups, including women, minorities, and persons with disabilities. GRFP is a critical program in NSF's overall strategy in developing the globally-engaged workforce necessary to ensure the Nation's leadership in advancing science and engineering research and innovation.

- 5 Year Award
- 3 Years Support
- \$30,000/yr Stipend
- \$12,000/yr COE
- International Research
- Supercomputer Access

By underwriting the training of graduate students with the demonstrated potential to be high-achieving scientists and engineers, the GRFP represents long-range investments for the future of society. For this reason, these Fellowships are distinct from grants designed to fund specific research or project development and do not require that special services be rendered by the recipient. Three years of support is provided by the program for graduate study that is in a field within NSF's mission and leads to a research-based master's or doctoral degree.

By The Numbers

- Approximately 46,000 GRFP fellowships have been funded since 1952.
- Approximately 6,000 Fellows are enrolled in over 230 institutions in the US and abroad.
- 2,000 new awards made each year in FY 2010, FY 2011 and FY 2012.

Unique Features

- **Portability:** Fellows may enroll in any accredited institution in the US.
- **Flexibility:** Fellows may be on reserve for 1-2 years to engage in intensive research at national or international research facilities, to gain industry research experience, to gain teaching experience, or to participate in other career-enhancing opportunities during graduate school.



Program Impacts

- Results in higher PhD completion rates for Fellows compared to non-Fellows
- Responsive to national needs for a strong, diverse and globally engaged science and engineering workforce
- Leverages NSF resources to broaden the participation of underrepresented groups.

Fellow Successes

- > 40 Nobel Laureates
- > 440 Members of the National Academy of Sciences
- Famous authors (Steven Levitt, Freakonomics) to corporate founders (Sergey Brin, Google, Inc.)

Professional Development Opportunities

- Global Research Opportunities Worldwide (GROW) http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504876
- Engineering Innovation Fellows Program (EIFP) <http://nsfeifp.asee.org/>