



Overview of International Opportunities @ the National Science Foundation

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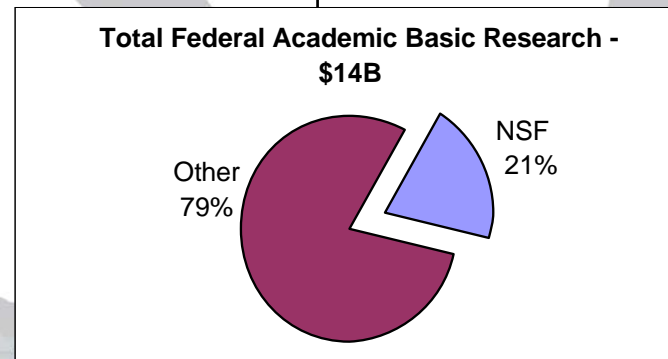
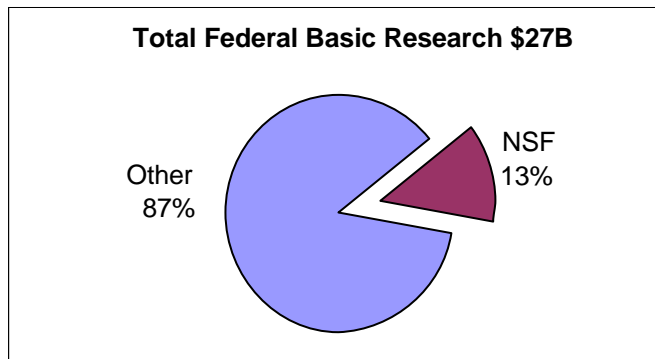
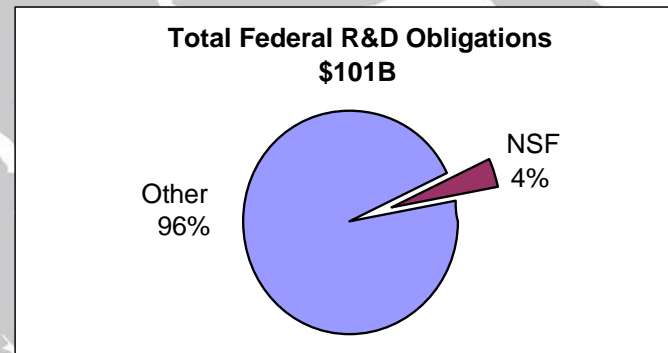
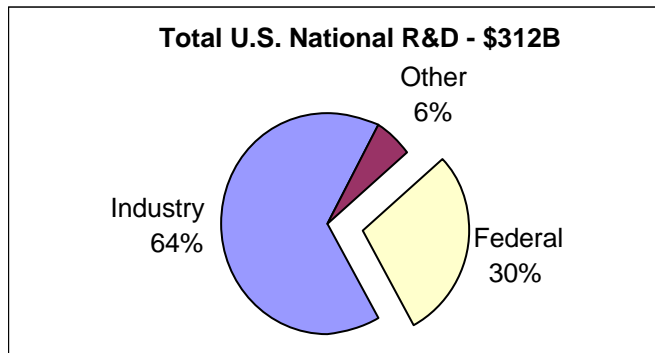


NSF in a Nutshell

- **Independent USG Agency**
- **Funds basic research & education**
- **Uses peer-review in selecting proposals to fund**
- **Low overhead; highly automated grant management processes**
- **Discipline-based structure complemented by Cross-disciplinary mechanisms**
- **Bottom-up proposal driven**
- **Use of Rotators/IPAs**
- **National Science Board**

NSF Role in Research and Development

Fiscal Year 2004



Latest complete data currently available



National Science Foundation

National Science
Board

Director
Deputy Director

Inspector
General

Biological
Sciences

Computer &
Information
Science
& Engineering

Engineering

Geosciences

Mathematical &
Physical
Sciences

Social, Behavioral
& Economic
Sciences

Education
& Human
Resources

Budget,
Finance & Award
Management

Information
Resource
Management

Office of
Cyberinfrastructure

Office of International
Science and Engineering

Office of Polar
Programs



The National Science Foundation

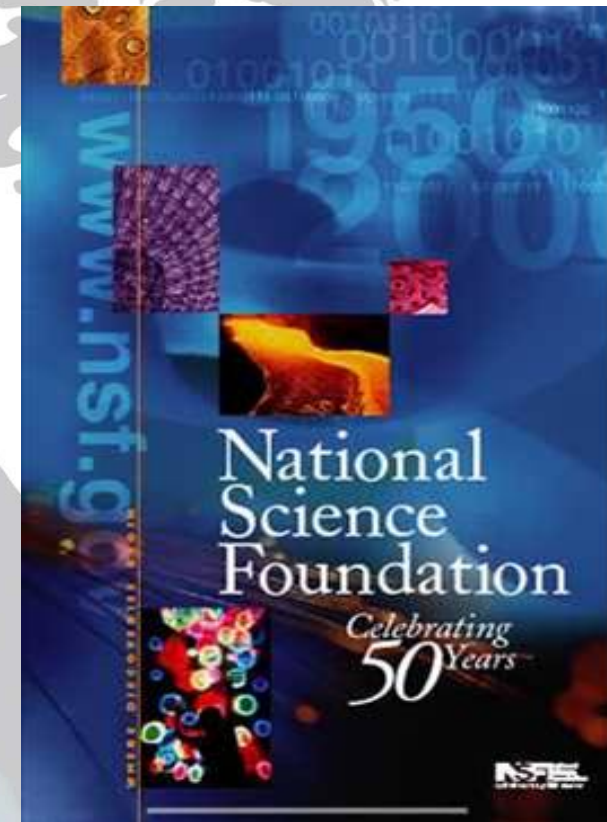
FEDERAL FUNDING agency

FY06 budget = \$5.6 billion

Seeks to advance US leadership in science and engineering research;

Supports BASIC research and education- Operates no labs

Awards grants to US UNIVERSITIES using a competitive merit-based peer review model.





NSF Funding

FY06 Budget: 95% awards, 5% administration

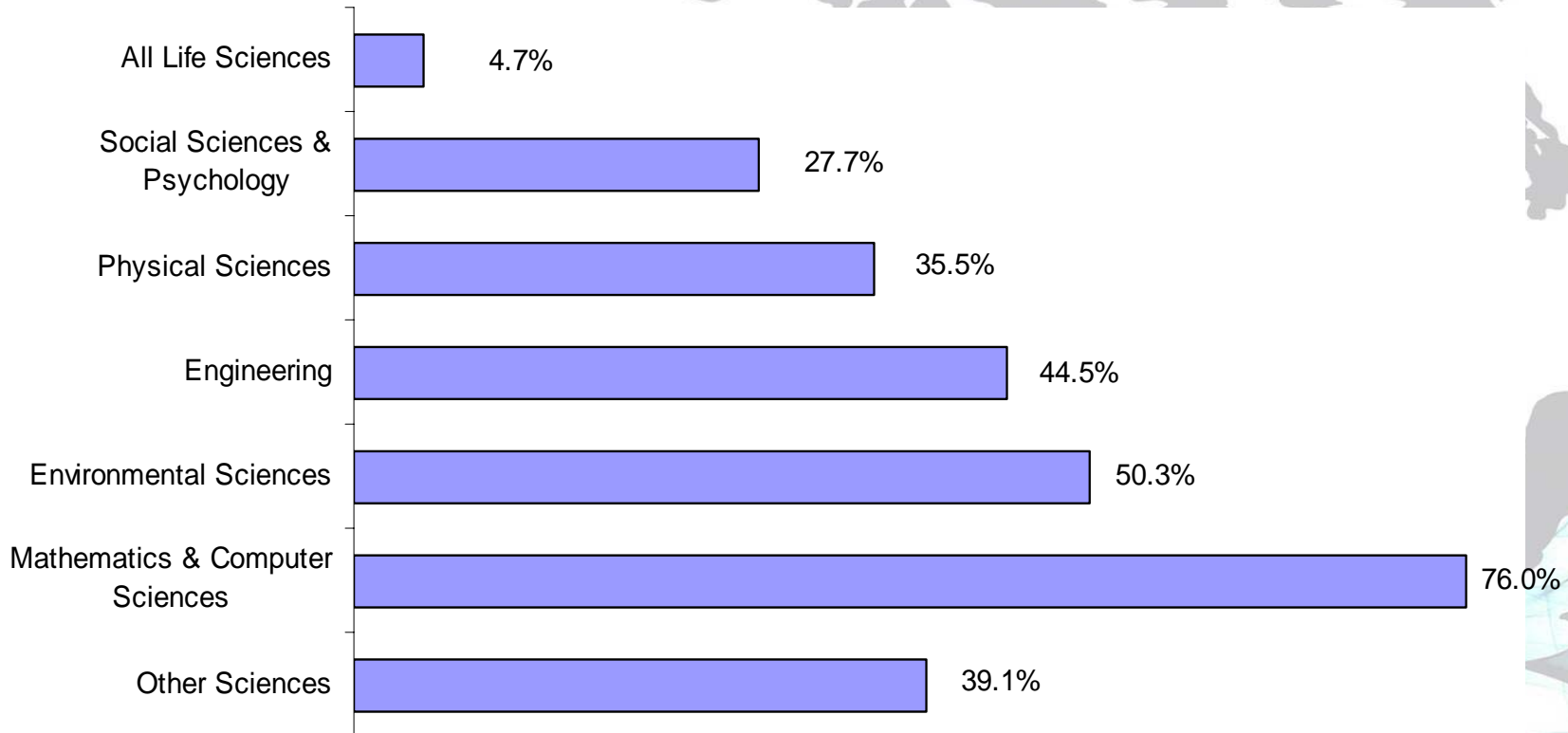
Each year NSF receives over 41,000 proposals and about 10,000 new awards are made (23% funding rate)

The average annual research grant is 3 years at \$140,000/year.

Awards are made to over 2,000 US colleges, universities and other research institutions.

NSF Support for Basic Research at Academic Institutions

Share of Total Federal Support - FY 2004





Four NSF Priority Areas for FY07

Advancing the Frontier

**Broadening Participation in
the Science and
Engineering Enterprise**

**Providing World-Class
Facilities and Infrastructure**

Bolstering K-12 Education

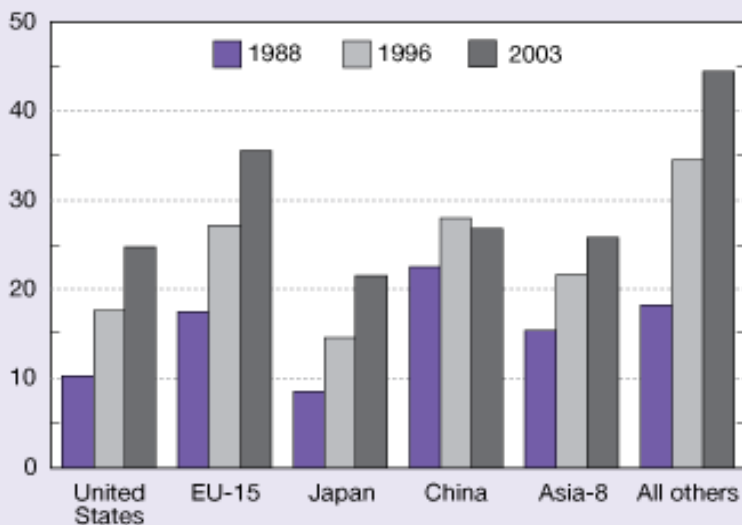




International Collaboration

Figure O-19
Share of scientific and technical articles with international coauthorship, by country/region: 1988, 1996, and 2003

Percent



EU = European Union

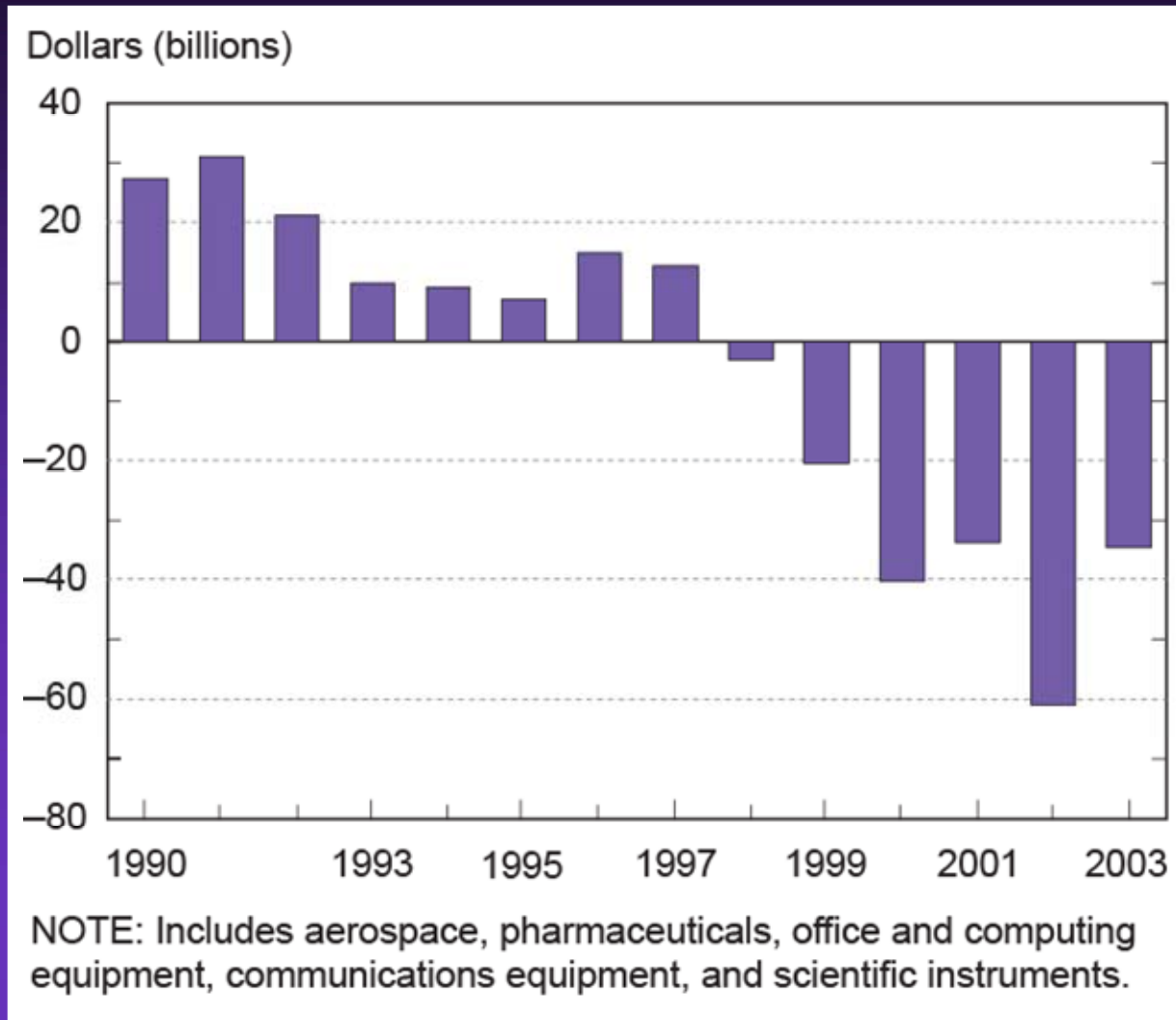
NOTE: Asia-8 includes South Korea, India, Indonesia, Malaysia, Philippines, Singapore, Taiwan, and Thailand.

SOURCES: Thomson ISI, *Science Citation Index and Social Sciences Citation Index*, <http://www.isinet.com/products/citation/>; iPLQ, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations. See appendix tables 5-47, 5-48, and 5-49.

Science and Engineering Indicators 2006

- ❑ International collaboration is commonplace
- ❑ About 20% of the world's scientific and technical articles in 2003 had authors from two or more countries, compared with 8% in 1988
- ❑ One-quarter of articles with U.S. authors have one or more international coauthors, which is similar to the percentages for Japan, China, and the Asia-8.

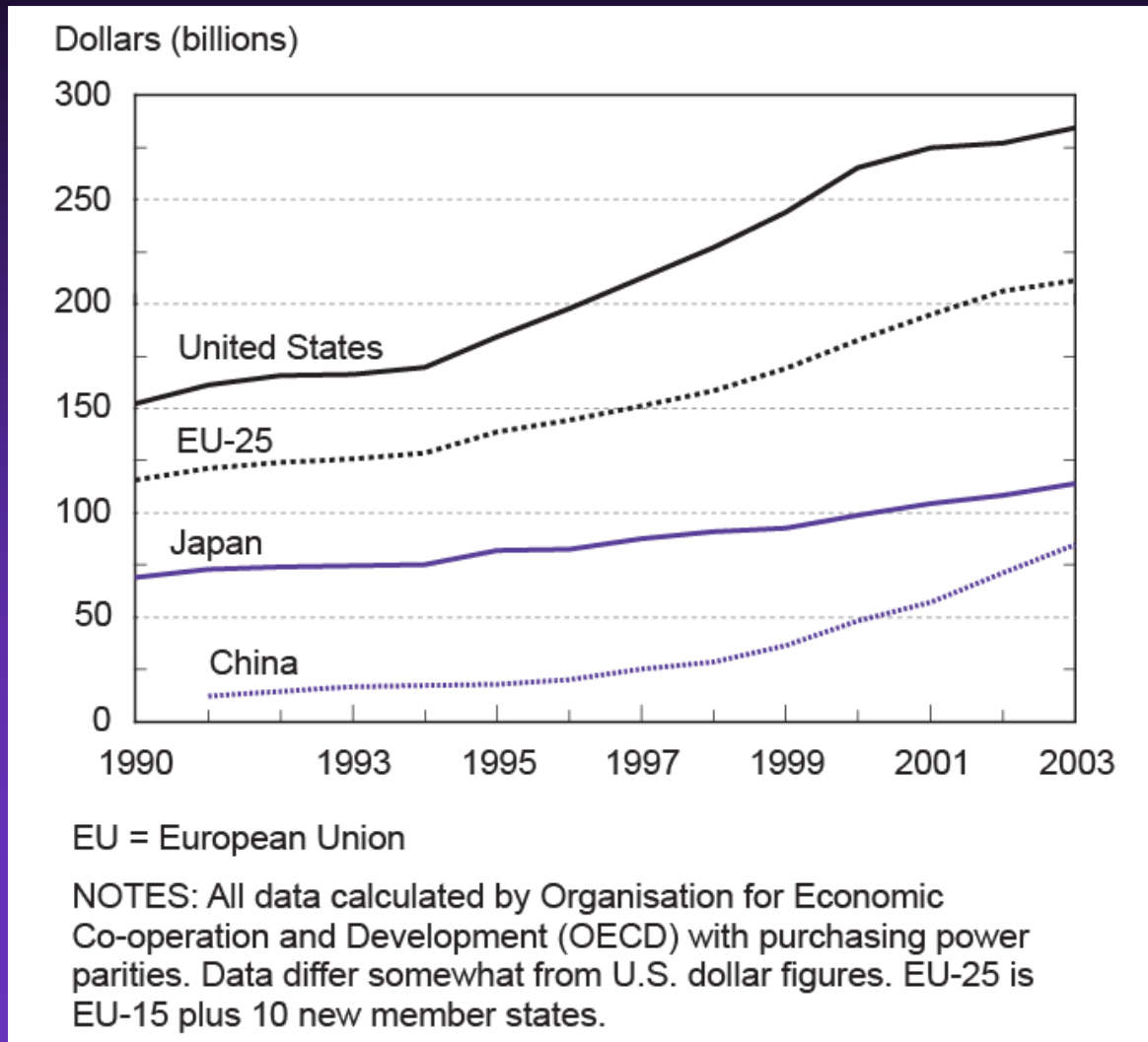
U.S. trade balance for five high-technology industries: 1990–2003



SOURCE: National Science Board, *Science and Engineering Indicators 2006*



R&D expenditures of selected region and countries: 1990–2003



SOURCE: National Science Board, *Science and Engineering Indicators 2006*



International Activities

NSF Objectives



- 1. Advance discovery**
- 2. Develop a globally engaged US Science, Technology, Engineering and Mathematics workforce**



NSF International Objectives...

A MEANS for advancing FRONTIER RESEARCH including
USG foreign policy goals

Provide ACCESS to sites, facilities, people, ideas

Build and strengthen effective collaborations and
institutional partnerships to address problems of a
global/regional scale

Prepare a GLOBALLY ENGAGED U.S. S&E workforce

*[NSF does NOT have a foreign affairs or foreign
assistance mission]*

What happens to your proposal when it arrives at NSF...?



Proposal Review Criterion

Intellectual Merit

- **Potential to advance knowledge within and across fields**
- **Qualifications of investigators**
- **Creativity and originality**
- **Conceptualization and organization**
- **Access to resources**

Proposal Review Criterion

Broader Impacts

- Promoting of teaching, training and learning
- Participation of underrepresented groups
- Enhancement of infrastructure for research and education
- Dissemination of results
- Benefits to society
- International collaboration

Office of International Science and Engineering (OISE)

Key elements for OISE funding:

- **Collaborative**
- **Synergistic**
- **Catalytic**
- **Junior researchers & students**



Support for International Activities



- **Supplements to existing NSF grants**
- **Part of new proposals to NSF disciplinary programs**
- **New proposals to Office of International Science and Engineering**

OISE Regional Clusters

- **Africa, Near East, South Asia**
- **Americas**
- **East Asia and Pacific**
- **Europe and Eurasia**
- **Global Initiatives**



Proposals to OISE

- **Planning Visits (\$20,000 max)**
- **Workshops (\$25-75,000)**
- **Partnerships for International Research and Education (\$2.5 million)**
- **Postdocs, Graduate and Undergraduate Students (varies)**

<http://www.nsf.gov/oise/>



Planning Visits

- **Short trips by US researchers in promising new areas**
- **Fully assess foreign expertise, facilities, equipment, data, experimental protocols, etc.**
- **Detailed preparation for collaborative research**



Workshops

- Co-organized by U.S. & foreign investigator
- Held in foreign country or United States
- NSF supports U.S. participants
- Identify areas of joint research
- Catalyze ideas for future research
- Stimulate dialogue on major bilateral S&T interests

Partnerships for International Research and Education (PIRE)

The background of the slide features a faint, light gray world map. Overlaid on the map is a complex network of blue lines that resemble a global communication or research network, with lines connecting various points across the continents.

- Cutting Edge scientific research
- Strong international partners
- Involvement of students & junior researchers
- Institutional resources (IT, language/culture, curriculum, study abroad, other)
- Innovative models
- 14-17, 5-year awards of up to \$2.5M each
- Eligibility: Ph.D. granting in U.S. (20 in 2 years)
- Prelim proposal deadline: October 30, 2006 (limit 3 per institution)

Partnerships (NSF 06-589)

- PIRE... “will **only** support activities that depend on intellectual collaborations with international partners; include significant and specific contributions from international partners and make use of the diverse capabilities of all participating institutions.”
- PI... “is expected to be an essential participant in research and educational activities”
- “US scientists and engineers must be globally engaged and able to operate effectively in international team settings with partners from different nations and cultures.”

Postdoctoral Researchers

The background of the slide features a stylized illustration. A dark grey silhouette of a world map is centered in the upper half. Below the map, a large, dark grey tree trunk and its spreading branches are visible. In the bottom right corner, there are several large, light green leaves with detailed vein patterns, some overlapping the tree branches.

- **Participation in NSF disciplinary awards**
- **Disciplinary Postdoctoral Fellowships**
- **International Research Fellowships**

International Research Fellowships

The background of the slide features a faint, stylized world map in shades of gray. Overlaid on the map is a graphic of two hands, one in a light blue color and the other in a light green color, cupping a globe. The hands and globe are positioned in the lower right quadrant of the slide.

- **Work outside the US for 9-24 months**
- **Re-entry support within 24-month tenure**
- **US citizens or permanent residents not beyond 2 years of Ph.D.**
- **Work in developing countries encouraged**
- **Deadline: October 3, 2006**

International Research Fellowships (\$60-200,000)

- Round trip airfare
- In-country travel
- Living allowance (set by location)
- Health insurance allowance
- Return professional travel
- Materials and equipment
- Field expenses
- Language training
- Host institutional allowance
- Support for dependent family members

Support for Graduate Students



- **Participation in NSF disciplinary awards**
- **Integrative Graduate Education and Research Traineeship (IGERT) Program**
- **Graduate Research Fellowships (GRF)**
- **Participation in OISE planning visits or workshops (PV&W)**
- **Dissertation Enhancement Awards (DDEP)**
- **East Asia and Pacific Summer Institutes (EAPSI)**

Integrative Graduate Education and Research Traineeship (IGERT)

- **Supports graduate research fellowships**
\$200,000 up to \$3 Million over 5 years
- **Multidisciplinary, problem-oriented focus**
PI applies through Institution, not a fellowship
- **Strong encouragement and support for international collaborations, including sending US students abroad**
- *...catalyze a cultural change in graduate education ... establish innovative new models for graduate education and training in a fertile environment for collaborative research that transcends traditional disciplinary boundaries...facilitate diversity and to contribute to the development of a globally-engaged, science and engineering workforce*

Graduate Research Fellowships (\$40,500/year)

- **Eligible: U.S. citizen or permanent resident at beginning of graduate program About 1,000 new fellowships each year -- rolling deadlines**
- **3 years of support over 5 years**
- **One-time international travel allowance of \$1,000**
- **Possibility of OISE supplement to support collaborative research at foreign site**

Dissertation Enhancement Research

The background of the slide features a faint, stylized world map in a light gray color. Overlaid on the bottom right of the map is a large, detailed green leaf with prominent veins, rendered in a semi-transparent style.

- Supports doctoral student research in a foreign country
- Must be collaborative, with evidence of intellectual involvement of foreign institution
- U.S. faculty mentor is PI on proposal
- Up to \$15,000 per award for up to 2 years
- Apply to NSF disciplinary program or OISE
- **Deadlines: 9/15 and 2/15 annually**

East Asia and Pacific Summer Institutes for U.S. Graduate Students (EAPSI)

Become an internationally experienced researcher. Spend eight weeks conducting research and experiencing life in:

Australia, China, Japan, Korea, New Zealand or Taiwan



East Asia and Pacific Summer Institutes for US Graduate Students



1991 SUMMER INSTITUTE KYOTO STUDY TOUR JUL.12 KIYOMIZU TEMPLE

- Conduct research at a host institute
- Language study and cultural orientation
- Professional visits
- Eight weeks June-August in Australia, China, Japan, Korea, New Zealand or Taiwan

EAPSI Goals



- **Introduce students to science and engineering in the Asia-Pacific region in the context of a research laboratory**
- **Have students initiate personal relationships that will facilitate future international collaborations**

EAPSI Partner Organizations

- U.S. National Institutes of Health (Japan only)
- Australian Academy of Science
- Chinese Ministry of Science and Technology
- Chinese Academy of Sciences
- National Natural Science Foundation of China
- Japan Society for the Promotion of Science
- Korea Science and Engineering Foundation
- Royal Society of New Zealand
- National Science Council of Taiwan

East Asia and Pacific Summer Institutes



"I never expected that simply being in a different place could be so stimulating for research ... but it was!"

EAPSI Participant Support



From NSF:

- **Arlington orientation**
- **International travel costs**
- **Stipend**

From foreign sponsoring organizations:


- **In-country living expenses
(housing, food, professional travel. etc.)**

EAPSI Applicant Eligibility

The background of the slide features a faint, stylized world map in a light blue-grey color. Overlaid on the map is a silhouette of a person in a dynamic, athletic pose, holding a globe. The person's arms are extended, and their legs are bent, suggesting movement. The overall aesthetic is clean and professional, with a focus on global connectivity and research.

- **U.S. citizen or permanent resident**
- **Enrolled at U.S. institution in a research oriented master's, M.D. or Ph.D. degree program**
- **Fields of science or engineering supported by NSF and represented among host institutions**
- **December 12, 2006--Application deadline**

Support for Undergraduate Students

A faint, artistic background illustration of a tree. A person is shown climbing the trunk of the tree. At the base of the tree, several hands are reaching up, symbolizing support. The illustration is in a light, sketchy style with a color palette of greens, blues, and greys.

- **Participation in NSF disciplinary awards**
- **International Research Experiences for Students (IRES)**
- **Research Experiences for Undergraduates (REU)**

International Research Experiences for Students

The background of the slide features a faint, light gray world map centered behind the text. In the bottom right corner, there is a large, stylized green leaf with prominent veins, partially overlapping the map and the text.

- **Can include graduate and undergraduate students**
- **Supports small groups of students in a focused field**
- **Awards of up to \$50,000 per year for up to 3 years**
- **Deadlines: 9/15 and 2/15**

Research Experiences for Undergraduates

The background of the slide features a stylized illustration. A dark grey silhouette of a world map is centered in the upper half. A large, dark grey tree trunk and its spreading branches are superimposed over the map. The lower half of the slide is filled with a dense cluster of green leaves, some of which are semi-transparent, creating a layered effect.

- **Supplements**
- **Sites**

REU Site - Japan



Advanced Technologies (Civil Engineering)
Washington University

REU Site - Hungary



Archaeology

Florida State University

REU Site – Tanzania



Ecology

University of Arizona

REU Site - France



Chemistry

University of Florida

REU Site – Costa Rica



Tropical Biology
Duke University

Looking Beyond the Borders: A Project Director's Handbook of Best Practices for International REU's

www.nsf.gov/pubs/2006/nsf06204/index.html





Key Documents

- FY 2007 NSF Budget Request
 - <http://www.nsf.gov/about/budget/fy2007>
- Grant Proposal Guide (NSF 04-23)
 - http://www.nsf.gov/publications/pub_summ.jsp?ods_key=GP
- Science and Engineering Indicators
 - <http://www.nsf.gov/statistics/seind06/>
- When in doubt –
 - <http://www.nsf.gov/>



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