



# **Office of International Science & Engineering (OISE)**

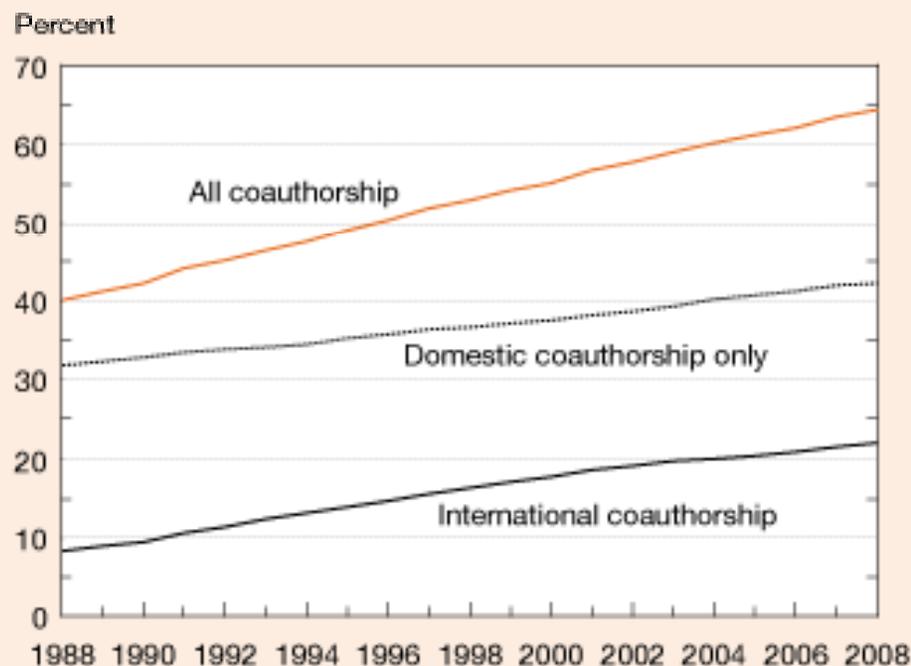
**D. Joseph Mook**





**International activities are  
supported across NSF**

Figure 5-21  
Share of world S&E articles coauthored  
domestically and internationally: 1988–2008



NOTES: Article counts from set of journals covered by Science Citation Index (SCI) and Social Sciences Citation Index (SSCI). Articles classified by year they entered database, rather than year of publication, and assigned to country/economy on basis of institutional address(es) listed on article. Articles on whole-count basis, i.e., each collaborating institution or country credited one count. Internationally coauthored articles may also have multiple domestic coauthors.

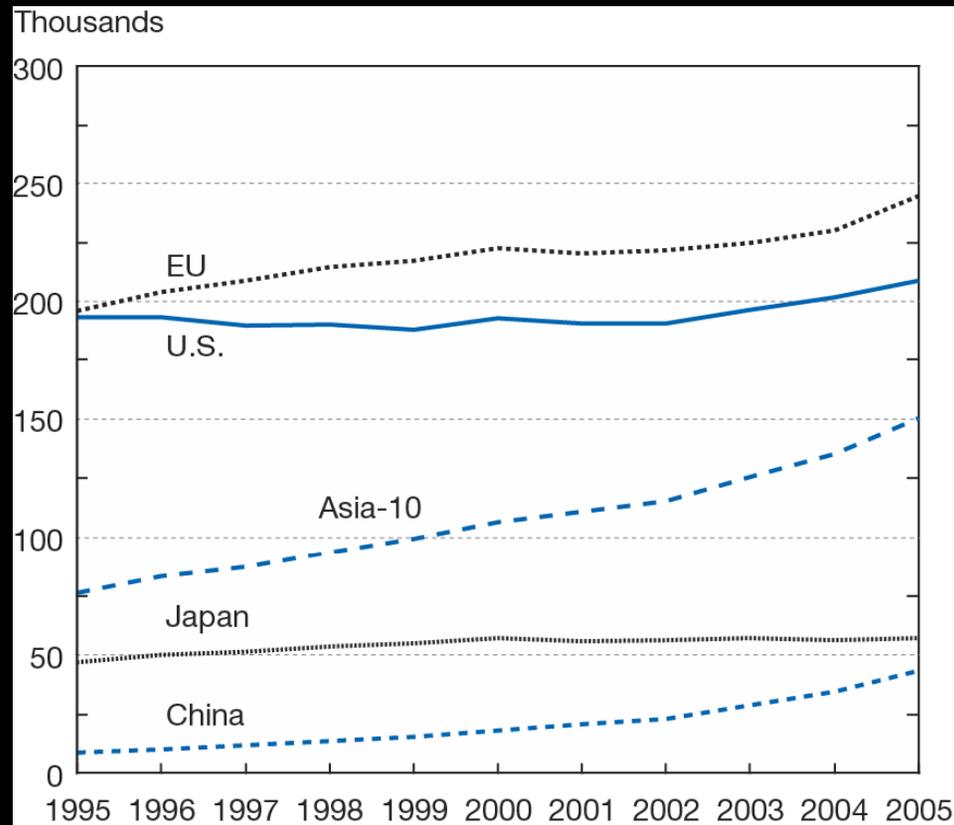
SOURCES: Thomson Reuters, SCI and SSCI, [http://thomsonreuters.com/products\\_services/science/](http://thomsonreuters.com/products_services/science/); The Patent Board™; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

*Science and Engineering Indicators 2010*

## Why International Collaboration?

Over 22% of the world's scientific and technical articles in 2008 had authors from two or more countries, compared with 8% in 1988

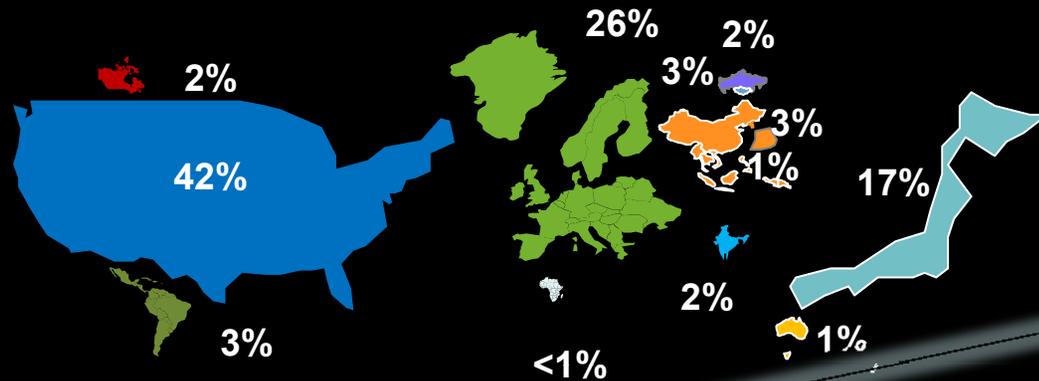
# Scientific and technical articles in peer-reviewed journals, by region/country: 1995–2005



NOTES: Asia-10 includes China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand. China includes Hong Kong.

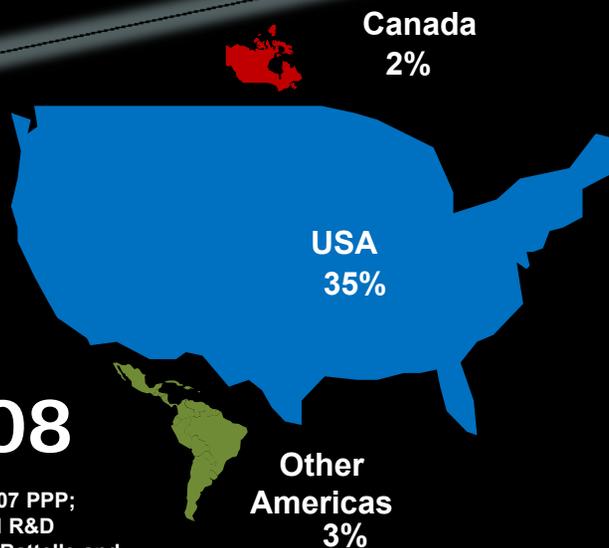
World S+T Investment Doubled from 0.5T to 1.0T from 1998\* to 2008\*\*

1998



\* UIS S&T database; World Bank - PPP data

Russia  
2%



2008

\*\* OECD 2007 PPP;  
2009 Global R&D  
Projection (Battelle and  
R&D Magazine) -

European Union  
25%

China  
11%

S. Korea  
3%

India  
2%

Africa  
<1%

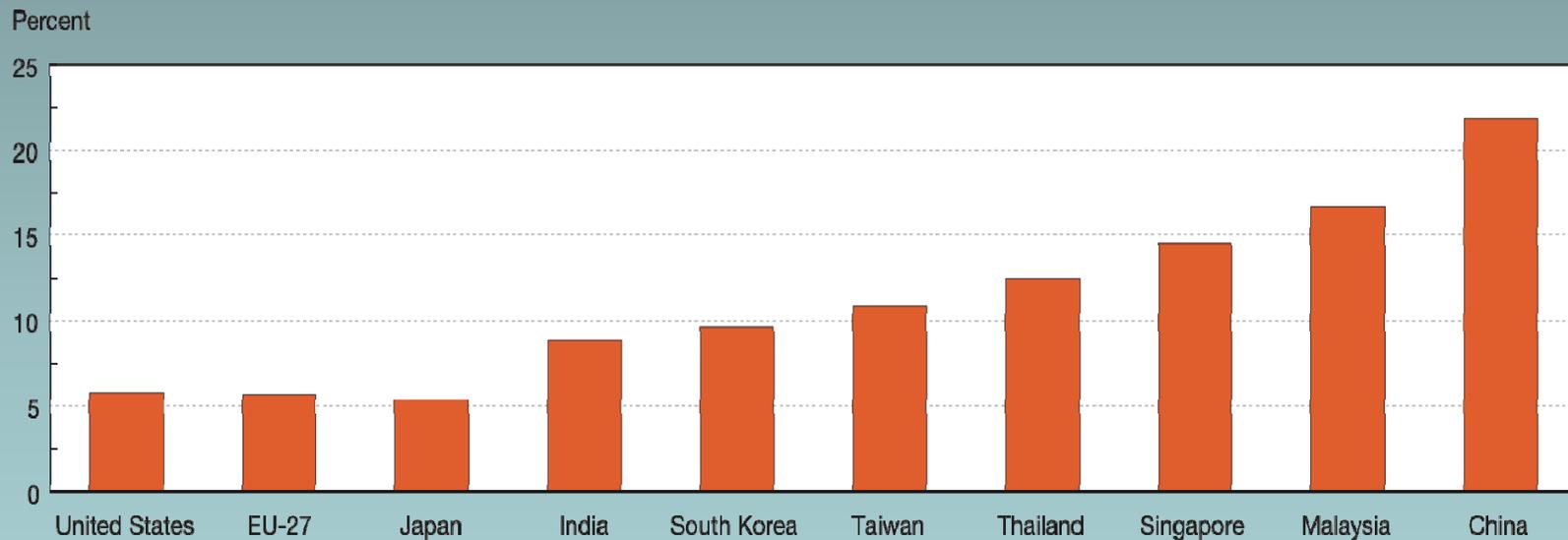
Australia  
1%

Japan  
13%

Taiwan  
1%

Other Americas  
3%

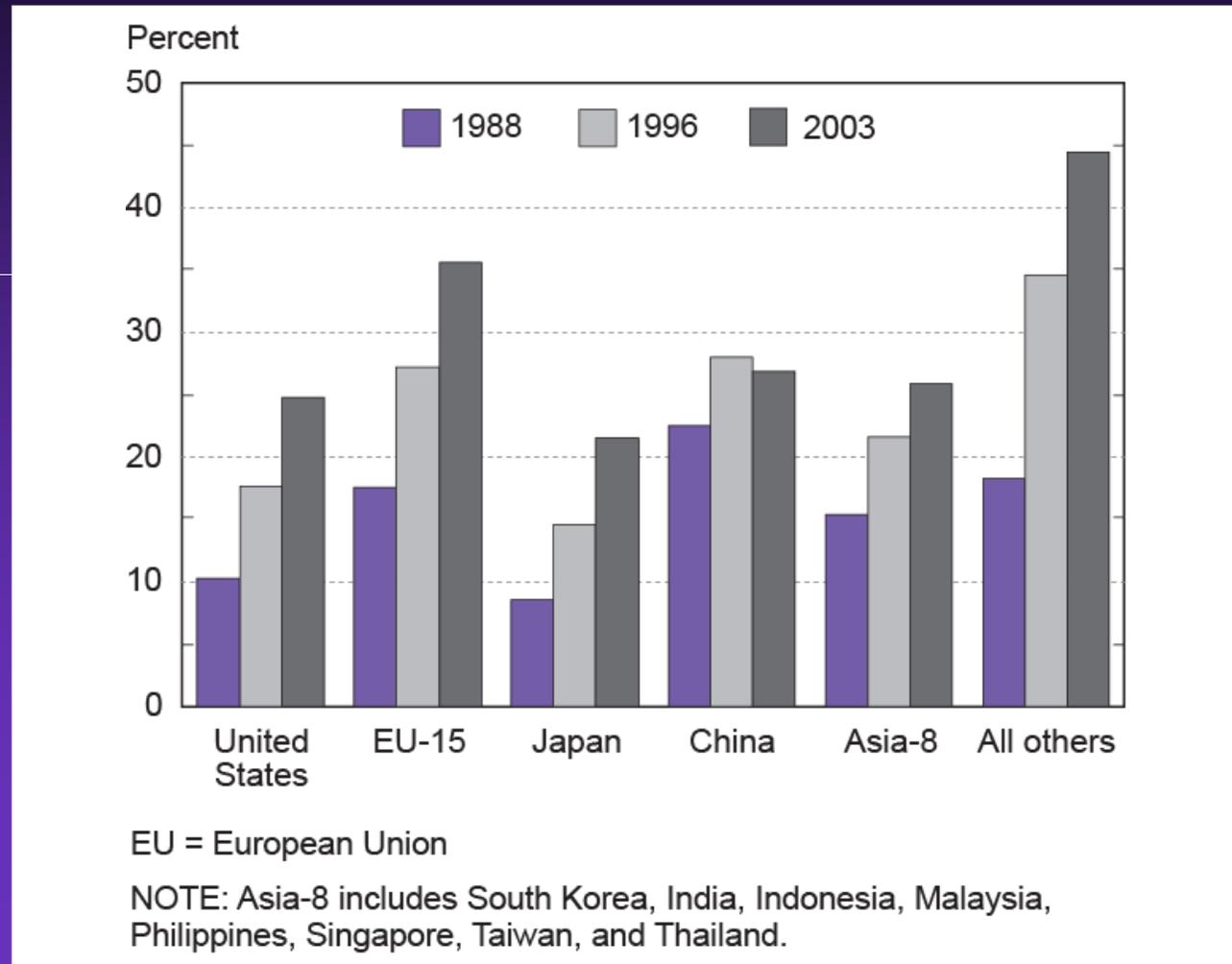
## Average annual growth of R&D expenditures for United States, EU-27, and selected Asia-8 economies: 1996–2007



EU = European Union

SOURCE: National Science Board, *Science and Engineering Indicators: 2010*

## Share of scientific and technical articles with international coauthorship, by country/region: 1988, 1996, and 2003



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



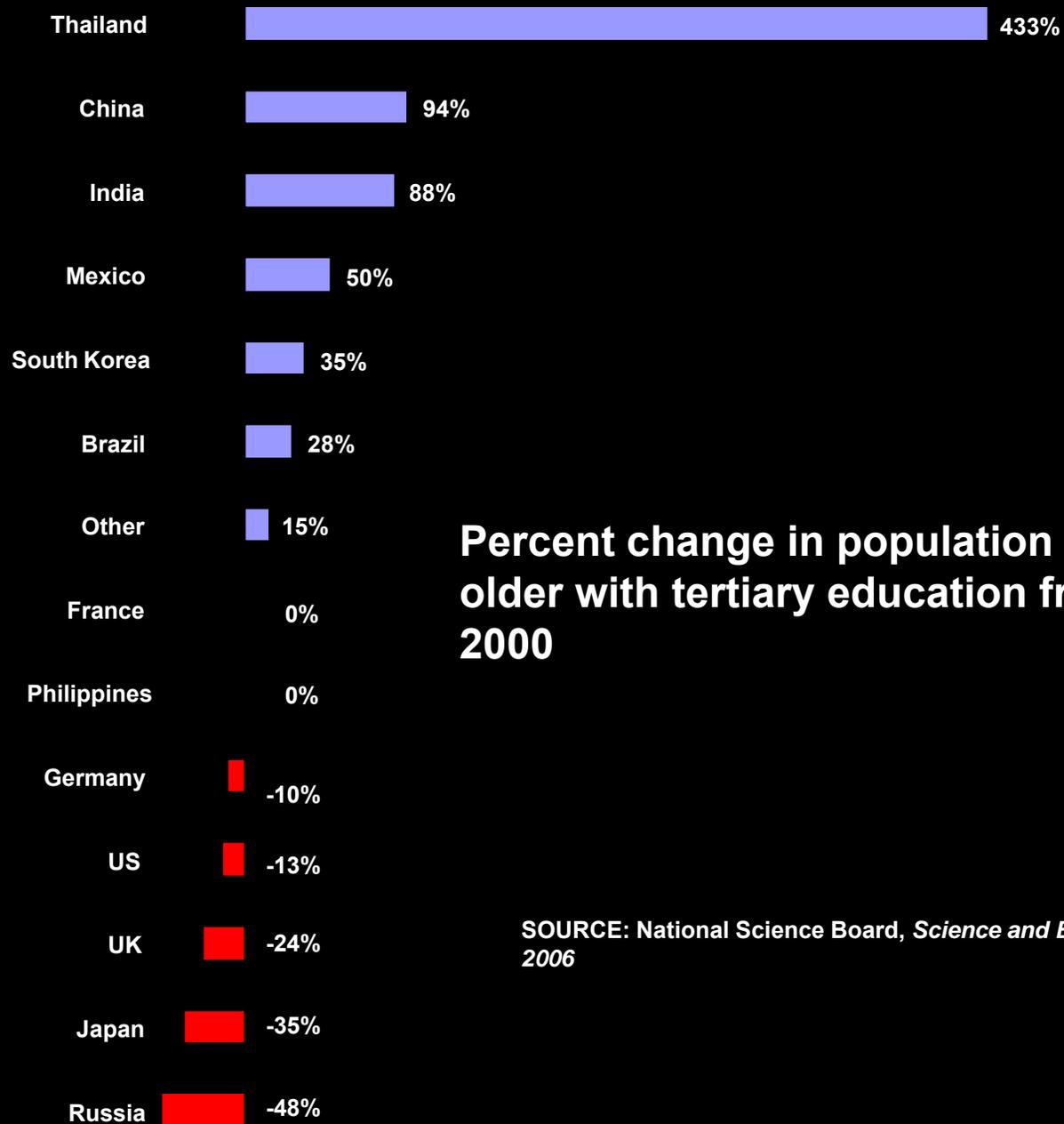
# Student Flows

	<u>To U.S.</u> *	<u>From U.S.</u> **
<b>Total</b>	<b>671,616</b>	<b>262,416</b>
<b>Engineering</b>	<b>118,980</b>	<b>8,135</b>
<b>**Destinations:</b>	<b>Europe</b>	<b>57%</b>
	<b>Latin America</b>	<b>15%</b>
	<b>Asia</b>	<b>11%</b>
<b>**Duration:</b>	<b>56.3% ≤</b>	<b>8 weeks</b>
	<b>39.5% ≤</b>	<b>1 sem or 2 qtrs</b>

\* 2008/2009 Enrollments

\*\* 2007/2008 Study abroad - approximate

Source: Institute for International Education, *Open Doors 2009*



**Percent change in population 15 years or older with tertiary education from 1980 to 2000**

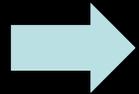
SOURCE: National Science Board, *Science and Engineering Indicators-2006*



# Does it matter?

## NSF Basic Missions:

- Support cutting-edge research and education across STEM
- Prepare the STEM workforce of the future



*Neither is possible without a substantial international component*

- Complex, Global Nature of Key Problems
- Science & Engineering Workforce Development
- Diffusion of Excellence in Science & Engineering



**“International cooperation  
in science is not a luxury;  
it is a necessity – and the  
foundation for the future.”**

*Arden L. Bement, Jr.  
NSF Director 2004-2010*



# NSF Organizational Structure

## **Directorates** (organized by research topic)

- Biological Sciences
- Computer & Info. Science & Engineering
- Education & Human Resources
- Engineering
- Geosciences
- Mathematical & Physical Sciences
- Social, Behavioral & Economic Sciences

## **Offices** (span NSF, interact with all directorates)

- Approximately 9 such organizations
- Some are organized by topic, some by function
- All report to NSF Office of the Director (not through Directorates)
- *\*Office of International Science and Engineering\**



# Office of International Science and Engineering (OISE)

- **Organized Primarily as Four Geographic Regional “Clusters”**
  - **Americas**
  - **Africa, Near East, and South Asia**
  - **Europe and Eurasia**
  - **East Asia Pacific**
- **Within each regional cluster, a “program coordinator” plus individual program officers with specific country assignments**
  - **Mook: Brunei, Burma, Cambodia, Indonesia, Laos, Malaysia, Philippines, Thailand**
- **Additional “Working Groups”: Global Initiatives, Muslim Majority Countries, Developing Countries, PIRE**
- **Support NSF Offices in Beijing, Paris, and Tokyo**



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## Office of International Science & Engineering (OISE)

### Important Notice

International science and engineering research and education activities are funded by all NSF directorates and offices.

Investigators seeking funding for international collaborative research may include an international component in **new proposals** submitted to their relevant NSF research program, or request [supplemental funding](#) to add international collaboration to projects supported by current NSF grants.

OISE works closely with other NSF directorates and offices to co-fund innovative, catalytic new awards and supplements that promote research excellence through international collaboration and develop the next generation of globally engaged U.S. scientists and engineers. OISE criteria for co-funding include:

- **True intellectual collaboration with a foreign partner** (The foreign partner's 2-page biographical sketch, communication outlining their role in the project, and a letter of endorsement from the foreign institution should be included.)
- **New** international collaborations, as opposed to well-established ones;
- Benefits to be realized from the **expertise and specialized skills, facilities, and/or resources** of the foreign collaborator; and
- Active research engagement of U.S. **students and junior researchers** at the foreign site.

Investigators should consult early in the application process with both the relevant disciplinary program manager and [OISE country program manager](#).



## **OISE & International Activities at NSF**

- **Supports new proposals submitted directly to OISE**
- **Co-funds new proposals submitted to NSF disciplinary programs**
- **Co-funds supplements to existing NSF grants**
- **Serves internal functions similar to university Office of International Education or similar**
  - **Advise and advocate throughout the Foundation**
  - **Act as center of expertise on international matters**
  - **Act as official contact for partner int'l agencies**
  - **Represent NSF in US government working groups**
  - **etc**

# OISE Guiding Principles

- True intellectual collaboration with foreign research partner (Foreign partner's 2-pg biosketch & communication outlining project role must be included. If foreign institution will provide resources, also include an endorsement letter from the foreign institution);
- New international collaborations, as opposed to well-established ones;
- Clear benefit to U.S. science/engineering community from expertise, facilities, or resources of the foreign collaborator; and
- Active research engagement of U.S. students and junior researchers at the foreign site.
- OISE only funds proposals of topical interest within NSF disciplinary programs

# OISE Programs

**IRES:** International Research Experiences for Students

**EAPSI:** East Asia & Pacific Summer Institutes

**DDEP:** Doctoral Dissertation Enhancement Projects

**IRFP:** International Research Fellowship Program

**ASI:** (PASI) Advanced Studies Institutes

**PIRE:** Partnerships for International Research and Education

**PV , WS:** Planning Visits and Workshops (Catalytic activities)

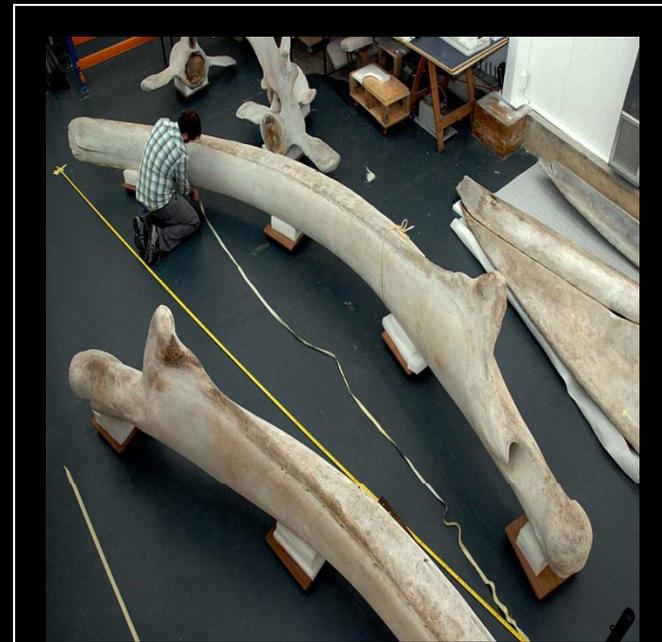
# International Research Experiences for Students: **IRES**

- US-based Faculty PI's organize an international research experience for US undergraduate/graduate students
  - Foreign mentorship required
  - Typically 4-6 students for 4-8 weeks, *single cohort*
  - Recruitment, preparation, logistics important
- \$50,000 per year for 3 years
  - Currently no PI salary allowed
- Point of Contact: Daniel (Joe) Mook  
([dmook@nsf.gov](mailto:dmook@nsf.gov))



# East Asia and Pacific Summer Institutes: **EAPSI**

- Gov't to gov't program
- Australia, China, Japan, South Korea, New Zealand, Singapore, or Taiwan
- Grad student submits proposal to NSF
- \$5,000 stipend, travel expenses
- 2 months in summer
- Point of Contact: Jong-on Hahm (jhahm@nsf.gov)



# **Doctoral Dissertation Enhancement**

## **Projects: DDEP**

- **Support doctoral research overseas**
- **No tuition or stipend**
- **Must be collaborative, with evidence of intellectual involvement of foreign institution**
- **U.S. faculty advisor is PI on proposal**
- **Up to \$15,000/yr for up to 2 years**
- **Point of Contact: OISE Regional/Country Program Officer**

# International Research Fellowships: IRFP

- Post-doc is applicant and PI
- Eligibility: no longer than two years beyond Ph.D. at time of application
- Scale of Funding: dependent on location
- Typical 9-24 months
- Point of contact: Ed Murdy ([emurdy@nsf.gov](mailto:emurdy@nsf.gov))



## Advanced Studies Institutes:

# PASI

- Short courses on leading-edge research themes
- Level: advanced graduate students, postdocs, and junior faculty
- Supported by Department of Energy and NSF
- Scale of Funding: may not exceed \$100,000
- Point of Contact: Harold Stolberg  
([hstolber@nsf.gov](mailto:hstolber@nsf.gov))

(also, individual country program officers)

# Catalyzing New Collaborations

- **Planning Visits and Workshops**
- **Developing Partnerships with non-US institutions**



# International Planning Visits and Workshops

## Planning Visits:

- Supports short travel to plan a *new* collaboration
- Up to \$20,000 , typical duration 1- 4 weeks
- Typically one US lab/group to one non-US lab/group
- Expected to be at late-stage full proposal preparation!!

## Workshops:

- Meetings co-organized by U.S. and foreign investigators
  - NSF funds US participants, perhaps some venue
- Scale of Funding: up to \$60,000
- Multiple groups from both sides; highly-focused at state-of-the-art

**Point of Contact: OISE Geographic Region/Country  
Program Officer**

# Partnerships for International Research and Education: **PIRE**

## *Program Objectives:*

- Enhance research excellence via international partnership and collaboration.
- Promote the development of a diverse, globally engaged U.S. scientific and engineering workforce.
- Strengthen the capacity of U.S. institutions to engage in and benefit from international research and education collaborations.

# Partnerships for International Research and Education: **PIRE**

## ➤ *PIRE Budget*

Proposals have no budget ceiling: PIs are encouraged to tell NSF what they need to achieve their project's research and education objectives

## ➤ *Who may apply to PIRE?*

Universities that granted one (1) or more Ph.D. in a science or engineering field since January 1, 2006, and are accredited in, and have a U.S. campus

Eligible institutions may submit 3 preliminary proposals



## ***OISE will not fund ...***

- **Individual or group travel to international conferences**
- **Projects without intellectual collaboration**
- **Costs for foreign participants (consult OISE for country exceptions)**



## NSF - USAID MOU



**NSF and USAID staff have identified themes or areas of joint interest to both agencies, including:**

- ***Water***
- ***Information Technology***
- ***Supply Chains***
- ***Construction Research***
- ***Food Security***
- ***Hazard Mitigation***

**Point of contact: DeAndra Beck  
([dbeck@nsf.gov](mailto:dbeck@nsf.gov))**





**International activities are  
supported across NSF**



**OISE's webpage:**

**[www.nsf.gov/oise](http://www.nsf.gov/oise)**

**Questions:**

**Joe Mook  
dmook@nsf.gov**