



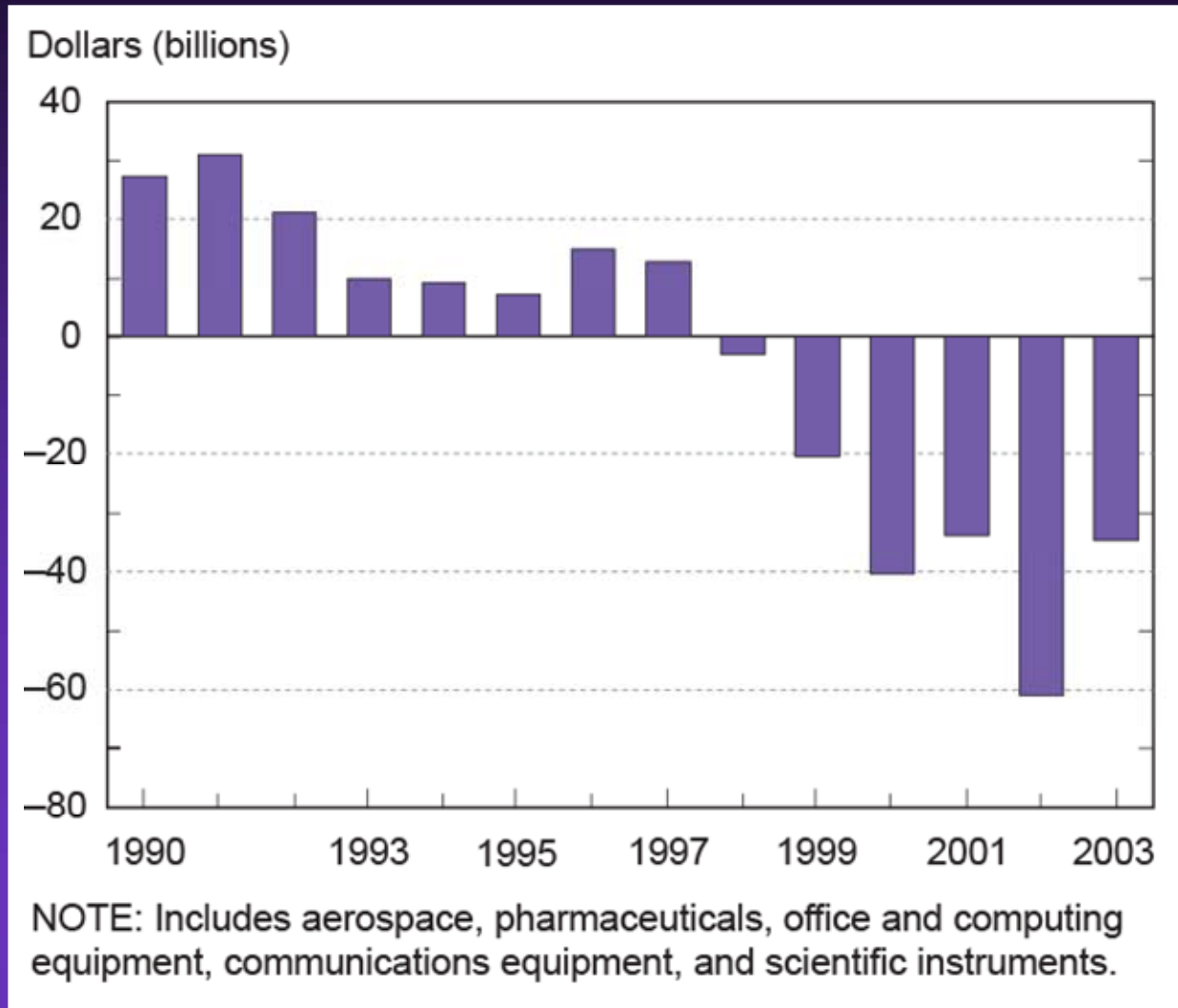
**Enabling the nation's future through
discovery, learning and innovation**

Why international?

NSF and international?

Larry Weber
Office of International Science and Engineering
National Science Foundation

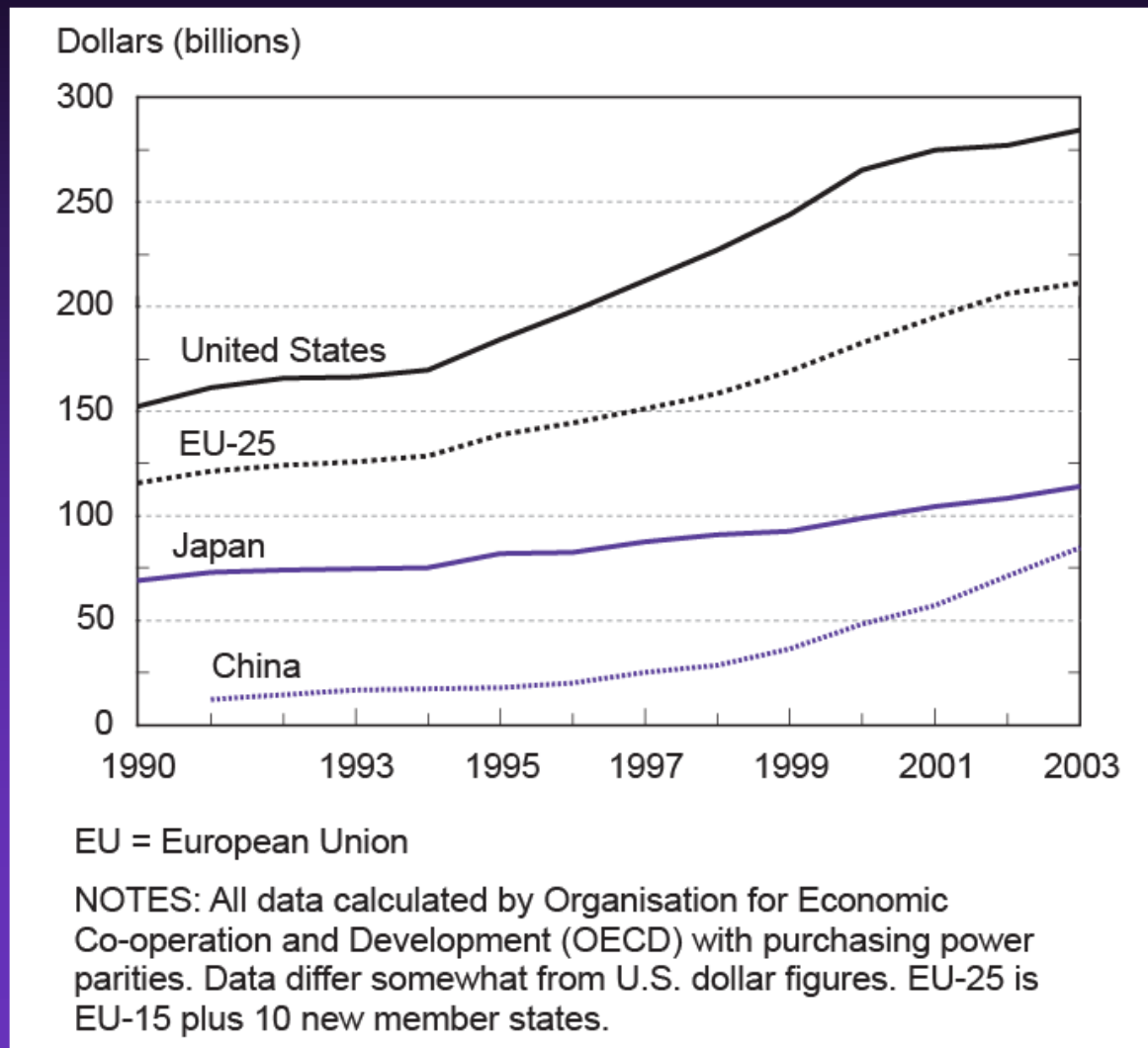
U.S. trade balance for five high-technology industries: 1990–2003



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



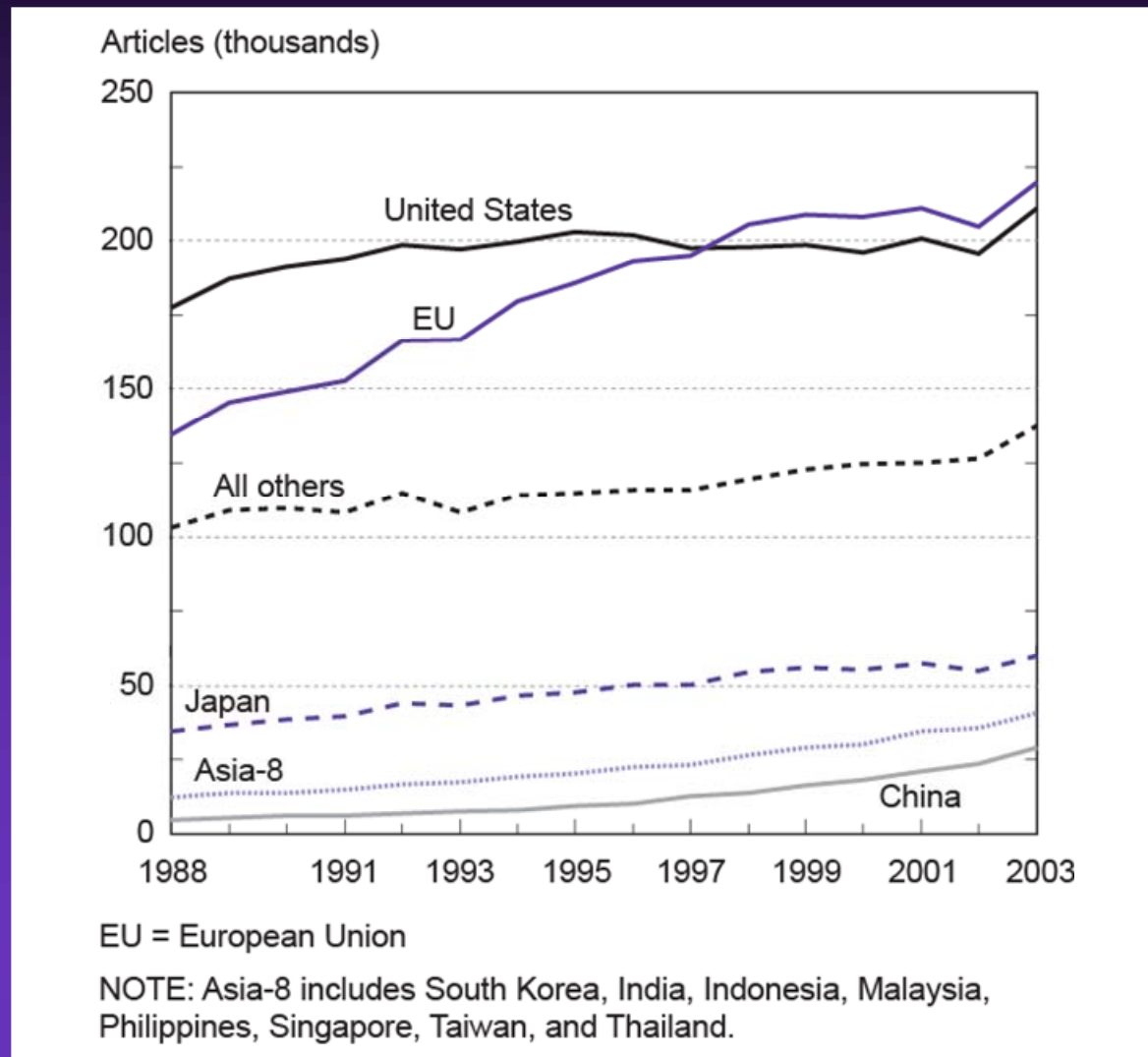
R&D expenditures of selected region and countries: 1990–2003



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



Scientific and technical articles, by country/region: 1988–2003

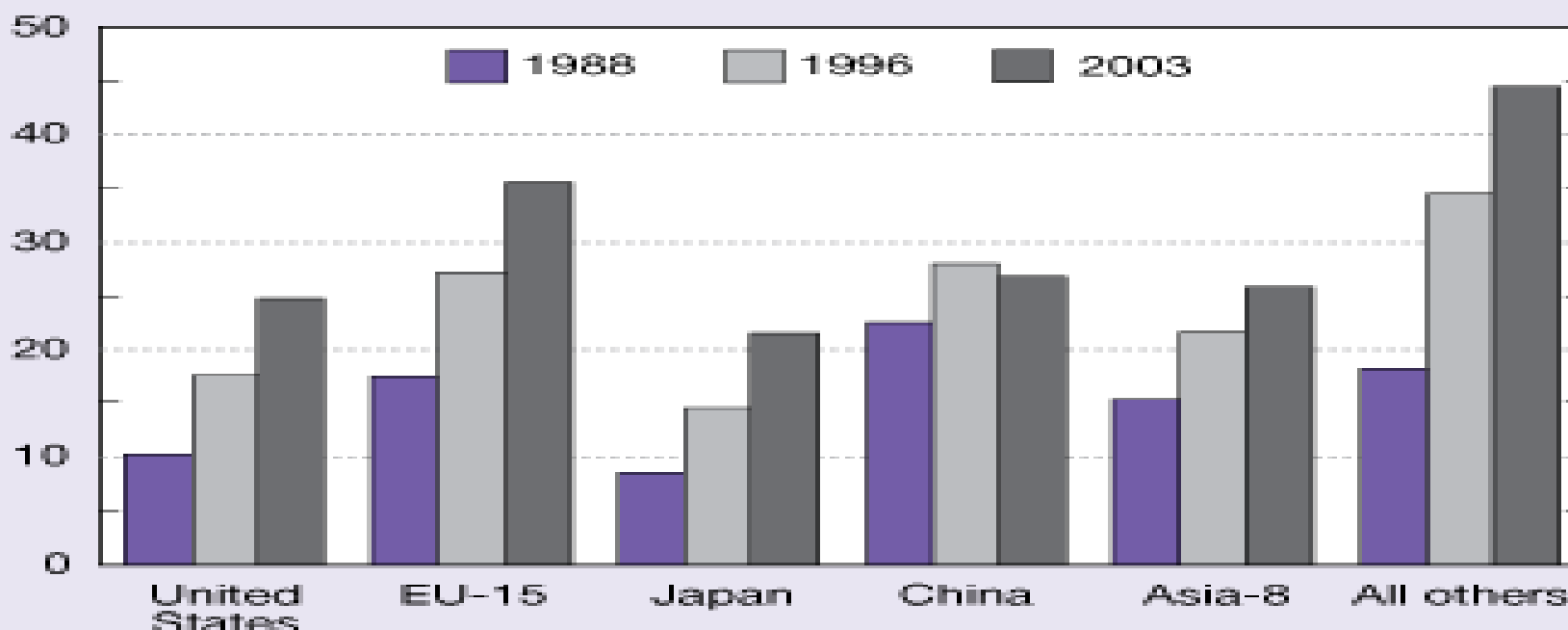


SOURCE: National Science Board, *Science and Engineering Indicators 2006*



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.

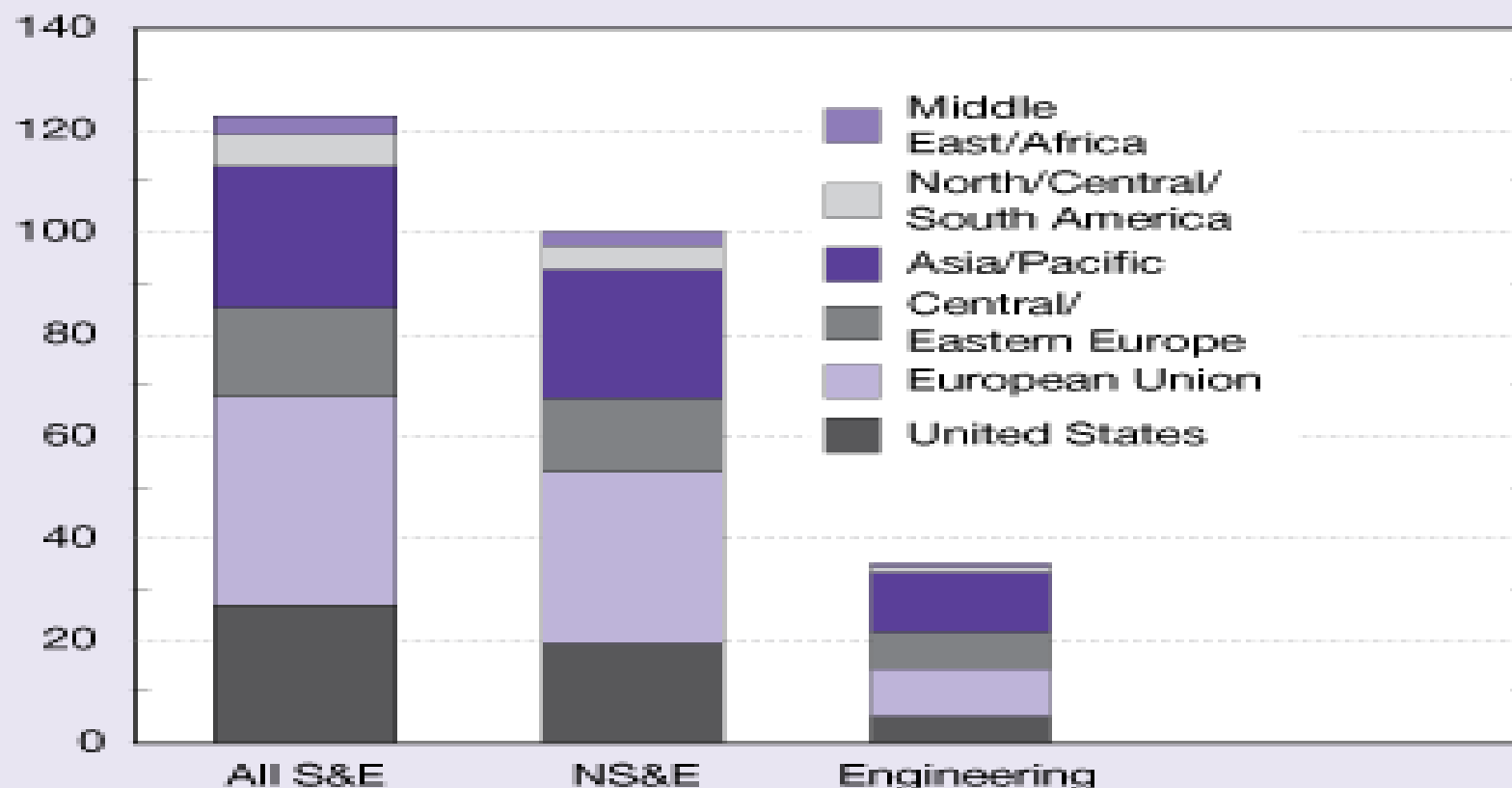
SOURCES: Thomson ISI, *Science Citation Index* and *Social Sciences Citation Index*, <http://www.isinet.com/products/citation/>; iplQ, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations. See appendix tables 5-47, 5-48, and 5-49.

Science and Engineering Indicators 2006

Figure O-25

S&E doctorates awarded, by country/region: Most recent year

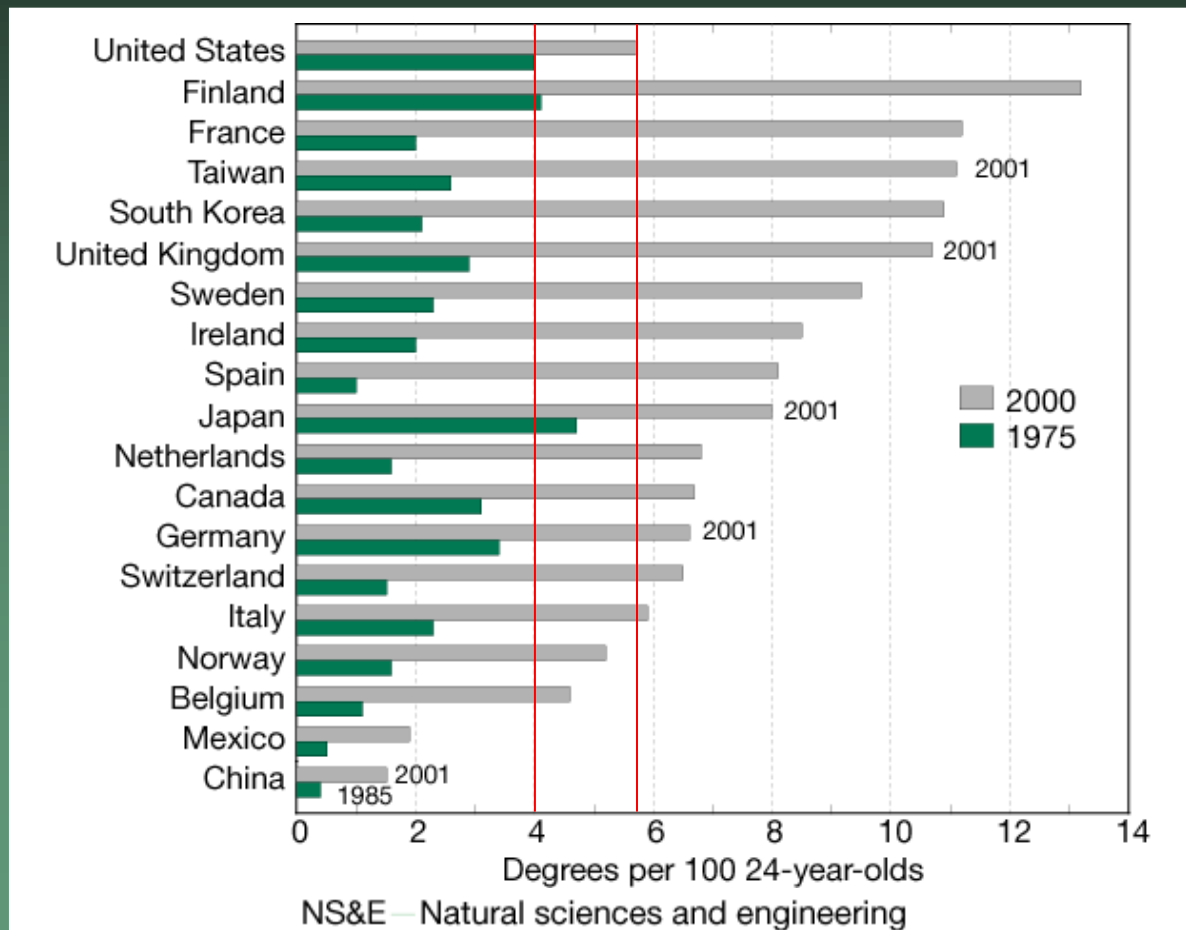
Doctorates (thousands)



NS&E = natural sciences and engineering

SOURCES: Organisation for Economic Co-operation and Development, Center for Education Research and Innovation, Education database, www1.oecd.org/scripts/cde/members/edu_uoeauthenticate.asp; United Nations Educational, Scientific, and Cultural Organization (UNESCO), Institute for Statistics database, <http://www.unesco.org/statistics>. See appendix table 2-41.

Ratio of first university NS&E degrees to 24-year-old population, by selected country/economy: 1975 and 2000 or most recent year



SOURCE: National Science Board, *Science and Engineering Indicators-2004*



Student Flows

<u>Students</u>	<u>To U.S.</u>	<u>From U.S.</u>	<u>To Japan</u>
Total	564,766	205,983	117,927
India	76,503	1,767	525
China	62,582	6,389	74,292
Korea	59,022	941	15,974
Japan	38,712	4,100	
Taiwan	27,876	194	4,211
U.S.			1,790

Source: IIE Open Doors 2006 and Japan Student Services Organization

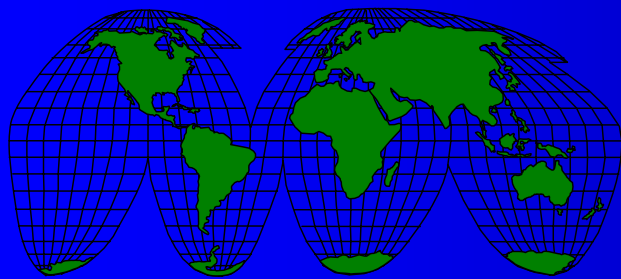
Discovery increasingly requires the expertise of individuals with different perspectives from different disciplines and often from different nations—working together to accommodate the extraordinary complexity of today's science and engineering challenges. The convergence of disciplines and the cross-fertilization that characterizes contemporary science and engineering have made collaboration a centerpiece of the science and engineering enterprise.

NSF Strategic Plan 2006-2011, 9/2006

Increasing international competition and workforce mobility, combined with a surge in international collaboration in science and engineering research, continue to alter the science and engineering landscape worldwide. To lead within this broader global context, the U.S. science and engineering workforce must build greater capacity for productive international collaboration.

NSF Strategic Plan 2006-2011, 9/2006

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



**Arden L. Bement, Jr.
NSF Director
May 2006**

NSF Objectives for International Activities

- **Advance discovery**
- **Develop a globally engaged US workforce**

NSF Support for International Activities

- **Supplements to existing NSF grants**
- **Part of new proposals to NSF disciplinary programs**
- **Proposals to Office of International Science and Engineering (OISE)**

Supplements to Existing NSF Grants

As stated on the OISE homepage:

“Investigators seeking funding for international collaborative research may ... request supplemental funding to add international collaboration to projects supported by current NSF grants.”

Supplements to Existing NSF Grants

- Discuss with managing disciplinary program officer and with relevant OISE country program officer
- Ask for joint review and joint consideration for funding

Part of new proposal to NSF disciplinary program

- Many solicitations explicitly encourage international collaboration
- Discuss with managing disciplinary program officer and with relevant OISE country program officer
- Ask for joint review and joint consideration for funding

Criteria for OISE Co-funding

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

Proposals Directly to OISE

- **Planning Visits**
- **Workshops**
- **Postdocs and Students**
- **Partnerships for International Research and Education**

Planning Visits

- **Up to \$20K**
- **Short trips by US researchers**
- **Assess foreign expertise, facilities, equipment, data, experimental protocols, etc.**
- **Plan for collaborative research**

Workshops

- **Up to \$60K**
- **Co-organized by US & foreign investigator**
- **Held in US or foreign country**
- **NSF supports US participants**
- **Identify areas of joint research**
- **Stimulate future collaborative proposals**
- **Include students and junior researchers**

Postdoctoral Researchers

International Research Fellowship Program

- **Typically \$100-200K**
- **Work outside the US for 9-24 months**
- **Re-entry support within 24-month tenure**
- **US citizens or permanent residents not past 2 years from Ph.D.**
- **Work in developing countries encouraged**

Graduate Students Dissertation Enhancement Awards

- **Up to \$15K**
- **U.S. faculty advisor is proposal PI**
- **Supports doctoral research in a foreign country**
- **Must be collaborative, with evidence of intellectual involvement of foreign institution**
- **If NSF disciplinary program supports dissertation enhancement, proposal should be submitted there**

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, Singapore 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 Participant Support

From NSF:

- **Arlington orientation**
- **International travel costs**
- **\$5,000 Stipend**

From foreign sponsoring organizations:

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

International Research Experiences for Students

- **Up to \$50K per year for 3 years**
- **Faculty PI directs collaborative research and education activities**
- **Can include graduate and undergraduate students**
- **Supports small groups of students in a particular field**

Partnerships for International Research and Education (PIRE)

- **5-year awards of up to \$2.5M each**
- **Cutting edge scientific research**
- **Strong international partnerships**
- **Involvement of students & junior researchers**
- **Institutional resources (IT, language/culture, curriculum, study abroad, other)**
- **Innovative models**

Criteria for OISE Funding

- Collaborative
- Synergistic
- Catalytic
- Junior researchers & students

International Activities

NSF Objectives

- **Advance discovery**
- **Develop a globally engaged US workforce**

OISE Regional Clusters

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



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