International Research & Education Collaboration: Opportunities & Resources at NSF

NSF Grants Conference
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Take Home Messages

• NSF supports international collaboration *when it enhances proposed research and education*
  • NSF funds U.S. side of collaboration
• Research directorates provide most support for international
  • OISE seed funds, student programs, PIRE
• NSF has growing number of strategic partnerships to facilitate international collaboration
• Review criteria unchanged
  • Intellectual Merit
  • Broader Impact
Global R&D Expenditures by Region

Figure O-5
Global R&D expenditures, by region: 2011
Billions of U.S. PPP dollars

North America
$462 (32.2%)
Central America and Caribbean
$0.6 (< 0.1%)
South America
$36 (2.5%)

Europe
$345 (24.0%)
Middle East
$31 (2.1%)
Africa
$11 (0.8%)

Central Asia
$35 (2.5%)
East and Southeast Asia
$456 (31.6%)

South Asia
$36 (2.5%)
Australia and Oceania
$24 (1.6%)

World total = $1,435

PPP = purchasing power parity.
NOTES: Foreign currencies are converted to U.S. dollars through PPPs. Some country figures are estimated. Countries are grouped according to the regions described by The World Factbook, available at www.cia.gov/library/publications/the-world-factbook/index.html.

Global Research and Development Funding

2013 Global R&D Funding Forecast

World of R&D 2012
Size of circle reflects the relative amount of annual R&D spending by the country noted.

Source: Battelle, R&D Magazine, International Monetary Fund, World Bank, OA World Factbook, OECD
Highly cited (top 1%) scientific articles by type of collaboration 2006-2008
As a percentage of highly cited scientific articles worldwide

Source: OECD calculations, based on Scopus Custom Data, Elsevier, December 2009
Statlink: http://dx.doi.org/10.1787/836087047406
Drivers for International Collaboration

Resources
- **Access** unique facilities and equipment
- **Share** costs and risks
- **Exchange** techniques and insights

Capacity
- **Strengthen/Expand** knowledge base
- **Attract** talent
- **Enhance** S&T-led economic performance

Objectives
- **Enhance** research and education
- **Leverage** complementary resources
- **Address** national, transnational challenges
- **Advance** personal/professional goals
Core Values for International

- Intellectual Collaboration
  - Engage researchers in-country
  - Mutual benefit where possible
- Leveraging complementary resources
- Young scientist/practitioner involvement
- Be true to NSF’s mission
  - Basic research and education
  - Not capacity building
- NSF funds U.S. side of collaboration
  - Limited exceptions
OISE Organization Chart

**Overseas Offices**
- Beijing – Nancy Sung
- Brussels – Sonia Ortega
- Tokyo – Office Head

**Global Initiatives**

**American**

**Europe and Eurasia**

**Africa, Near East, and South Asia**

**East Asia and Pacific**

**Administrative Management**

**Office Head**

**Deputy Head**
NSF Budget (Research & Related Activities)

- **FY 2011**
- **FY 2012**
- **FY 2013**
- **FY 2014**
- **FY 2015**
- **FY 2016 Request**

**OISE Budget [Million USD]**

- **OISE (R&RA)**
- **NSF (Budget)**
- **NSF (R&RA)**

**NSF Budget [Billion USD]**

- From FY 2011 to FY 2016, the NSF budget has shown a steady increase.
- The NSF (R&RA) budget has also increased but at a slower rate compared to OISE.

**R&RA – Research & Related Activities**
Most international research and education activities are funded by NSF disciplinary programs:

- As part of regular awards
- As supplements to regular awards
Some Special International Funding Opportunities

- Dimensions of Biodiversity
- Collaborative Research in Computational Neuroscience
- Belmont Forum Collaborative Research Action
- Several Directorates/Division (SBE, GEO, BIO/DEB) offer lead agency agreements
- Partnerships for Enhanced Engagement through Research (PEER)
**OISE Programmatic Activities**

**Partnerships – Tools for International Research**
- **PIRE**  Partnerships for International Research and Education  $19\text{ M}$
- **CNIC**  Catalyzing New International Collaborations  $1.5\text{ M}$
- **GVF**  Global Venture Fund  $3.2\text{ M}$
- **SAVI**  Science Across Virtual Institutes  $1.3\text{ M}$
- **PEER**  Partnerships for Enhanced Engagement in Research (USAID/NAS; NIH, NASA, USDA, USGS, Smithsonian)

**Talent Development – Developing a Globally Engaged Workforce**
- **IRES**  International Research Experiences for Students  $5.0\text{ M}$
- **EAPSI**  East Asia & Pacific Summer Institutes  $1.6\text{ M}$
- **IRFP**  International Research Fellowship Program (Postdocs)  $3.0\text{ M}$
- **GROW**  Graduate Research Opportunities Worldwide (Grad-students)
- **iREU**  International Research Experiences for Undergraduates
- **STEM-AGI**  STEM Advanced Graduate Institutes (Global PASI)

**Type:**  Stand-alone  **Co-funding Program**  Under Consideration
Partnerships – Tools for International Research

PIRE  Partnerships for International Research and Education  $ 19 M
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Talent Development – Developing a Globally Engaged Workforce

IRES  International Research Experiences for Students  $ 5.0 M
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Type:  Stand-alone  Co-funding Program  Under Consideration
Partnerships for International Research & Education

PIRE
- ISE-managed flagship international research program
- Frontier research leverages unique, complementary expertise of US & international partners
- Extensive overseas research opportunities for US students / early career researchers
- Institutional impact for international science
- Strengthen capacity of institutions, multi-institutional consortia, and networks to benefit from international research and education collaborations
- Development of globally-engaged U.S. science and engineering workforce
- 76 PIRE awards have engaged collaborators in more than 70 countries across all NSF disciplines
- 5-year awards, averaging $4.5M

<table>
<thead>
<tr>
<th>Year</th>
<th>Funding</th>
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<tr>
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<td>$17.8 M</td>
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<td>FY 2014</td>
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<td>FY 2015</td>
<td>$18.5 M</td>
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The Global Reach of PIRE
Ancient biodiversity and global change in the New World Tropics: A once-in-a-century opportunity along the Panama Canal (OISE 0966884)

As a byproduct of the expansion of the Panama Canal, researchers gain a better understanding of the geologic evolution of the Isthmus of Panama in fields of paleontology, paleo-botany and tectonics/geochronology. This interdisciplinary project brings together four U.S. institutions and four Panamanian institutions and is training nearly 60 students.
Global Venture Fund (GVF)

- Co-funds or supplements to NSF directorate awards
- Funds allocated across OISE regions
- NSF Program Officers submit request to OISE
  - Guidance via internal memo
- OISE internal panel reviews to ensure program goals met
- Co-funds or supplements up to $75,000; higher with additional justification

<table>
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<th>Directorate</th>
<th>2012 Co-funds</th>
<th>2013 Co-funds</th>
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<td>MPS</td>
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<tr>
<td>FY 2012</td>
<td>126</td>
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<tr>
<td>FY 2013</td>
<td>220</td>
<td>$4.0M</td>
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Science Across Virtual Institutes

SAVI

Platform for teams of NSF-funded investigators to:

- **Network** with partners abroad
- **Leverage** resources to advance shared research interests
- **Engage students** in international collaboration.

SAVI is a mechanism, **not a stand-alone program**

- ISE and NSF Directorate support
- Support from counterpart agencies overseas
PEER

- USAID-funded competitive grants program to support research & capacity building for developing country scientists
- U.S. investigator must have an active NSF award (or NIH, USDA, USGS, NASA, Smithsonian). May request supplement if partner funded
- Proposals reviewed by panel of science experts with development experience
- Only certain countries are eligible this year (2016)
- Must address USAID – development objectives
- USAID contributes $6-7 million annually to this program
- Managed by National Academies of Science
- **Check the website!**

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<th>PROPOSALS</th>
<th>AWARDS</th>
<th>COUNTRIES</th>
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<tr>
<td>2011</td>
<td>488</td>
<td>41</td>
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<td>2012</td>
<td>237</td>
<td>54</td>
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<tr>
<td>2013</td>
<td>254</td>
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## OISE Programmatic Activities

### Partnerships – Tools for International Research

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Type: Stand-alone Co-funding Program Under Consideration
IRES

- Develop a more globally engaged S&E workforce
- Supports small group of students for focused research experience overseas
- U.S. faculty organizes international research experiences for small groups of U.S. undergraduate/graduate students. Foreign mentorship required
- $250,000 maximum budget for up to three years
EAPSI

• Summer research opportunity for U.S. STEM graduate students

• 8-10 week summer research program in EAP
  Australia (25 positions), China (40), Japan (65), Korea (25), New Zealand (15), Singapore (15), Taiwan (25)

• Open to grad students who are U.S. citizens or permanent residents

• Partnership with counterpart funding agencies
International Research Fellowship Program

IRFP

- Early post-docs (within two years of PhD)
- Post-doc is the applicant and PI
- Introduce scientists and engineers in the early stages of their careers to international collaborative research opportunities
- Fellow’s mentor is the foreign collaborator
- Residence abroad for 9 - 24 months
  - Up to $200,000 in support
  - PI support for research, stipend, cost of living, transportation, insurance and dependents

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</tr>
<tr>
<td>FY 2012</td>
<td>154</td>
<td>32</td>
<td>$4.50 M</td>
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<tr>
<td>FY 2013</td>
<td>*</td>
<td>30*</td>
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*In FY 2013 IRFP became a co-funding program and 24 of the 30 co-funded awards were in the BIO Directorate*
GROW offers opportunities for 2-12 month international research collaborations to NSF Graduate Research Fellows

17 Current Partners

Australia, Austria, Brazil, Chile, Denmark, Finland, France, India, Ireland, Japan, Korea, Mexico, Netherlands, Norway, Singapore, Sweden and Switzerland

Expanding partnerships for future

Contact: grow@nsf.gov
Keys to Success in ISE Funding

• Read the program announcement
• Strong Intellectual Merit, Broader Impacts
  • How does the collaboration enhance the work?
• Involve U.S. students, junior researchers
  • Prepare, mentor, and assess
  • Pay them: travel, living costs, stipends
• Include letter(s) of support from collaborator(s)
• Include biosketch of key collaborator(s)
  • ...unless solicitation prohibits it (CAREER)
  • Other senior project personnel (not co-PI)
• Work with others in your institution
• Know and observe special rules, e.g.
  • Fly America Act
  • Host country visa, permit requirements
• Ask early, ask often
Finding OISE on Web

http://www.nsf.gov/od/oise/about.jsp
Finding OISE Staff by Country

http://www.nsf.gov/od/oise/country-list.jsp
Thank You!
For Further Information
cestabro@nsf.gov