The following draft summary does not necessarily reflect the positions of the National Science Board.

A Summary of Presentations and Discussion from the National Science Board Task Force on International Science Hearing and Roundtable Discussion on International Science Partnerships

George Washington University
Washington, D.C.
May 11, 2006

Rationale for U.S. Government Support of International Science and Engineering (S&E) Partnerships

Participants highlighted the numerous benefits for S&E research and development that stem from international science partnerships.

Science is a global enterprise

In the 21st century, advances in S&E will, to a large measure, determine the rate of economic growth, quality of life, and health and security of the world. The conduct, communication, and use of science – all intrinsically global – are increasingly important in addressing many critical global issues. Science has truly become a global enterprise. New ideas and discoveries are emerging from all over the world, and the balance of S&E expertise is shifting among countries. Scientific advances will increasingly depend on our ability to draw upon the best minds regardless of national borders.

Participants highlighted the numerous benefits for S&E research and development that stem from international science partnerships. Through cooperative scientific exploration, researchers gain access to foreign data, platforms, facilities, sites, expertise, information, and technology that all can be utilized to advance the cause of science towards new knowledge. International S&E partnerships can lead to improved tools, models, products, and services due to global use, testing and feedback, as well as provide an increasingly important means of keeping abreast of new insights and discoveries critical to maintaining U.S. pre-eminence in key S&E fields.

As the funding and personnel devoted to S&E in countries around the world continues to grow, so too has output from these activities, including scientific articles, patents and high-technology products[1]. As a result, international networks have become a major part of U.S. research and development efforts. Such networks not only tap into the global pool of human talent, but also cultivate cooperation among states and further other foreign policy objectives. Participants broadly supported international networks and the value they bring to the advancement of science and technology. Examples include the International Materials Science Research Network, the International Long-term Ecological Research Network, the Smithsonian Institution's Global Biodiversity Information Facility in Panama, and the National Institutes of Health (NIH) Alumni Associations abroad (in Brazil, China, India, Mexico and parts of Africa).

[1] *Science and Engineering Indicators 2006, op cit., pg. O-3.*

Agency missions

For a number of Federal agencies, international S&E partnerships are essential for achieving their mission. For example, the work of agencies such as National Oceanic and Atmospheric Administration (NOAA) and National Aeronautic and Space Administration (NASA) is inherently trans-boundary in nature and global in scope. In some cases it is impossible for Federal agencies to accomplish their domestic missions unless international partnerships and communication are robust and vibrant. International cooperation and partnerships also provide Federal agencies with cost-sharing opportunities on large-scale research programs and facilities.

Participants expressed general support for principally domestic focused mission S&E agencies in the U.S. to play a greater role in international S&E partnerships. However, those agencies, by and large, pursue international S&E collaboration to the extent that they can justify the direct relationship of the international activities of their domestic mission, further leveraging their limited research funding to reap the many benefits that stem from such partnerships. Participants noted that there are opportunities for Federal S&E agencies to collaborate with other agencies, non-governmental organizations, and the private sector, to leverage the S&E activities they fund. One such training and capacity building project highlighted during the day's discussion was the Famine Early Warning System, a joint project between NOAA and U.S. Agency for International Development (USAID), which assists in monitoring efforts for the Sub-Saharan portion of the African continent and plays an important role in helping USAID predict where humanitarian assistance will be needed.

Access to the best minds in the word

The U.S. Government recognizes that the best and brightest scientific minds are not always found within its borders. The Department of Defense (DOD) and the National Institutes of Health (NIH) are among the Federal agencies that regularly provide funding to international researchers for the purpose of conducting research with U.S. partners.

However, one forum participant noted that international collaboration does not necessarily create true "partnerships" and urged the importance of creating an atmosphere that emphasizes building equal partnerships between U.S. and non-U.S. researchers. Participants also noted that while U.S. competitiveness and S&E partnerships may be viewed by some as conflicting goals, the need exists to emphasize that they are also complementary in many respects. The growth of scientific capacity outside the U.S. is in many ways an important resource that will increase the pool from which new ideas are created, and can help strengthen the national and global economy.

Tackling inherently global issues

Participants also pointed out that some problems facing the U.S. and the world today cannot be solved without the participation of other nations, including climate change, energy resources, public health, water management, and a sustainable food supply. Through cooperation, the U.S. can provide leadership on many of these issues of international concern. In addition, many of the most pressing scientific issues today have a global span, making it difficult to conduct research without international cooperation. Avian influenza, global warming, and natural disasters such as hurricanes, earthquakes, and tsunamis are several such examples. The success of projects such as the Global Earth Observation System of Systems (GEOSS), a global network that will enable coordinated observations, better data management, and increased data sharing is a high priority in the U.S. Government, and its success is highly dependent on successful international cooperation.

Capacity building

Several participants noted that one of the greatest benefits of international S&E partnerships between the developed and developing worlds is capacity building. Capacity building strengthens the international community by increasing stability in fragile regions, which, in turn, strengthens the security and economic prosperity of the world. Modest funding in this area can result in substantial benefits to the U.S., other nations, and the international scientific enterprise.

A recent example of such capacity building is the Iraqi Virtual Science Library, developed by the Departments of State and Defense, which provides Iraqi researchers with the same access to scientific journals and research as one would expect on any university campus in the U.S. One additional point noted by a forum participant was the importance of developing scientific institutions in developing countries in order to facilitate cooperation and communication. An example of this is the Africa Academies of Science project at the National Academy of Sciences, which demonstrates the benefit of taking a regional approach to capacity building rather than a country-by-country approach.

Science and engineering partnerships as an instrument of 'soft power'[2]

Participants discussed that international scientific partnerships can be an extremely important instrument of foreign policy and soft power. Science and engineering can serve as an important, apolitical bridge between nations. They can contribute to building more stable relations among communities and nations through cooperation and by creating a universal language and culture based on commonly accepted values of objectivity, sharing, integrity, and free inquiry. Science, technology, and engineering education can also be instruments for democratic and well-governed states by empowering good governance by meritocracy, by the notion of open and free enterprise, and by open research.

Scientific partnerships can be used explicitly for foreign policy objectives. The U.S. Civilian Research and Development Foundation (CRDF) is an example of a non-governmental organization dedicated to building international S&E partnerships. Congress created the CRDF in the wake of the collapse of the Soviet Union to address problems that arose when thousands of scientists and engineers, many of them former weapons scientists, no longer had an outlet for their work. The CRDF has provided research grants, training, and exchange programs that enable these scientists and engineers to continue making productive contributions in their fields and help them participate in the rebuilding of their countries, while also building S&E partnerships with American counterparts. Several participants pointed out the current lack of dedicated federally appropriated funding for these types of programs is a serious constraint for greater use of S&E partnerships to improve relations between countries.

Communicating the multiple benefits of international S&E partnerships

Finally, other participants noted there is a need for increased awareness, particularly in Congress, of the importance of the U.S. Government developing a much more focused cross-agency strategy to better utilize international S&E partnerships. One participant suggested that policy makers need to emphasize the importance of international S&E partnerships and the positive impact they have on a

[2] The term 'soft power' was first coined by Harvard University professor Joseph Nye in 1990 to refer to the ability of states to indirectly influence the behavior or interests of other states through an attraction to shared values or other cultural or ideological means. Successful use of soft power relies heavily on a state's reputation within the international community and the quality of the flow of information between the states involved. Popular culture and media are two sources of soft power, as well as the spread of a state's national language.

multitude of fronts, above and beyond pushing forward the frontier of science. Important benefits gained through international S&E partnerships include strengthening the domestic and global economy, supporting civil society, promoting gender equality, and protecting against weapons of mass destruction. Participants agreed that international S&E partnerships can also be a very effective vehicle for strengthening public diplomacy.

Challenges of Building and Maintaining International S&E Partnerships

Stronger central coordination is possible

In the U.S., no one agency appears to be responsible for coordinating or supporting international S&E partnerships. It falls to individual S&E agencies to establish their own international research priorities and policies to meet their domestic mission objectives. Inter-agency coordination is often accomplished through information exchanges across various roundtables and panels that include representatives from different Federal agencies.

However, participants generally agreed that there are policy issues that transcend individual agencies and require greater cross-agency coordination. Without restricting the autonomy of Federal agencies, some participants suggested that the Office of Science and Technology Policy (OSTP) within the Executive Office of the President could play a greater role in coordinating international S&E partnership activities, with the Department of State and/or USAID serving as focal points for providing support for such efforts.

Impact of Post-9/11 Security Measures

Several participants mentioned that some policies implemented or strengthened following the September 11th attacks have inhibited international S&E partnerships. Issues such as intellectual property protection, management and access to data, data representation policies, export controls, materials/technology transfer policies, standards, and visa policies all require careful debate to foster the growth of U.S. participation in S&E partnerships, while protecting the security of the U.S. and the world. U.S. S&E researchers, policy makers, and students must work together to create solutions for problems that transcend individual government agencies or research institutions. While real progress has been made on many of these issues, participants cautioned that the work is far from done. It was suggested that in future deliberations, it would be important to reach out to Federal agencies not necessarily involved in S&E research activities, but who are involved in areas critical for international partnerships and collaboration, such as intellectual property rights.

The day's discussion highlighted that policy makers could take several measures to strengthen the reputation and credibility of the U.S. in regard to these issues. Participants agreed that while the international community is aware of the need to safeguard dual-use technologies that may be used to create weapons of mass destruction, it is often unclear which technologies need to be protected and which ones do not. All participants felt that the U.S. could do more to develop mechanisms to ensure transparency related to policies restricting international access to knowledge and technologies.

Some believe that in the post-9/11 context, the nation is reverting – by means of deemed exports and visa restrictions – to a policy of S&E isolationism. In an increasingly more interdependent world, participants agreed that isolationism is no longer a realistic policy option. Several participants underlined that science is one of the strongest tools for the application of soft power that the U.S. has today.

Federal agencies tend to take a more narrow approach

Participants pointed out Federal S&E agencies often engage in international scientific partnerships to fulfill their individual mission objectives. This can be attributed to the global nature of U.S. national interests, as well as to the rapidly growing international scientific capacity. For example, the DOD has a presence around the world with offices in Tokyo, Singapore, Chile, Argentina, and Australia, for the purpose of identifying mutually advantageous research collaborations. However, in most cases, S&E agencies are not permitted to engage in international S&E partnerships beyond the scope of their domestic mission. In the absence of an authoritative directive requiring agencies to work beyond their missions for the greater good, agencies will continue to take a more narrow approach to international S&E partnership activities. Domestic S&E agencies have the scientific expertise but lack the funding to conduct or mandate to coordinate a cross-agency strategy for, international S&E partnerships for the goals being examined by the Board's Task Force.

Adequacy and flexibility of funding

Participants agreed that adequate funding was an important component of international S&E partnerships. Some participants highlighted that the U.S. Government has no significant source of funds specifically appropriated for building international S&E partnerships on a global basis. Science and technology agreements between nations are often viewed as being no more than a statement of good intentions, because they have no funds committed.

Funding agencies have varying, but usually little latitude, in how they fund international institutions and partnerships between U.S. and non-U.S. researchers. The NIH serves as a unique model for funding the best ideas in the world, regardless of origin, although foreign scientists are asked to provide a justification of why U.S. tax dollars are spent abroad.[3] The Fogarty International Center within NIH is specifically dedicated to funding global health issues and also serves as its diplomatic arm.

Several participants voiced concern that many domestic research funding agencies, such as the National Science Foundation (NSF), the U.S. Geological Survey (USGS), and NOAA, do not have adequate latitude to fund international researchers and institutions or to build creative mechanisms to support international S&E partnership programs.

Challenges in managing and administering partnerships

Participants agreed that the varied nature of the U.S. S&E community makes administering and managing scientific partnerships particularly challenging. Hearing participants discussed the following challenges involved in international S&E partnerships:

- Complexity grows as the number of partners increases;
- Communication and cultural barriers;
- Funding uncertainties both in the U.S. and in other countries;
- Free and open access to scientific data; and
- Changes of administration both in the U.S. and abroad.

[3] The Public Health Service Act provides authority to support direct awards abroad.

Globally Engaging S&E Researchers and Students

Students, scientists, and researchers are the building blocks of the S&E community. The discussion highlighted two human resources issues facing the U.S. S&E community today:

- Attracting the best and brightest minds, regardless of nationality; and
- Strengthening and expanding the international exposure of U.S. students and researchers to the international S&E community.

The U.S. has always attracted many international students and researchers, but numerous participants noted how security regulations implemented after the September 11th attacks have made it more difficult for foreign students and researchers to enter the country. The Department of State has done much to address numerous problems that pertain to the ability of non-U.S. scientists and students to enter the U.S., however a perception persists among the international community that the U.S. does not welcome non-U.S. scientists and students. At the same time that the Department of State has recorded a decline in foreign students and researchers entering the country since September 11th, [4] participants voiced concern that not enough American students are entering the S&E workforce or participating in international S&E education and research experiences. Participants generally agreed that in order for the U.S. to remain competitive, more needs to be done to encourage U.S. students to chose careers in science and engineering, as well as to become more globally aware by pursing research opportunities outside the U.S.

Attracting the best and brightest regardless of nationality
Obstacles to attracting the most highly qualified candidates from abroad include the U.S. visa system and highly restrictive deemed export regulations. Participants suggested that the Federal government take several additional steps to restore the U.S. as the most desirable venue for scientific research, including:

- Improve the visa approval process for researchers and students;
- Revise visa regulations to remove the requirement that international researchers must leave the U.S. after their research/education has been completed;
- Give visa priority to S&E researchers and students in designated areas of national need; and
- Improve deemed export policies, making them more transparent and consistent.

It was generally felt that these policy adjustments would send a signal to the international community that the U.S. welcomes opportunities to share knowledge across national boundaries, to forge transnational relationships, and to promote the progress of science.

Strengthening international exposure of U.S. students and researchers
The international scientific community is growing at a rapid pace, and the U.S. no longer leads the world in scientific publications. In the late 1990s, the European Union surpassed the U.S. as the global leader in number of scientific and technical journal articles[5]. As centers of research excellence emerge across the world, internationally oriented organizations such as the NIH Fogarty

[4] According to the Council of Graduate Schools, international graduate applications to U.S. graduate school programs were down 28 percent in 2003-04, and dropped another 5 percent in 2004-05 before slightly rebounding by 11 percent in 2005-06. Application numbers still remain well below pre-9/11 figures.
[5] *Science and Engineering Indicators 2006*. National Science Board. Figure O-17, pg. O-10. Available online at: < http://www.nsf.gov/statistics/seind06/>.

International Center, the German Research Foundation, and the European Union noted more could be done to encourage U.S. researchers and students to take advantage of research and educational opportunities abroad.

With more foreign researchers encouraged to seek research opportunities outside the U.S., some participants noted that a new pattern of international S&E partnerships and workforce migration is emerging. Instead of brain drain problems experienced by the developing world in the 1980s, the emergence of several centers of excellence have resulted in a new environment best described by multiple participants as brain circulation. Nations are encouraging researchers to leave their home countries to build bridges with foreign researchers leading innovative studies abroad. The idea is that the researchers will return home to their native countries and share their knowledge and networks with researchers there. The German Research Foundation is a major proponent of this sort of initiative. Another example is the NIH Global Health Research Initiative Program, which funds scientists from developing countries to do research in the U.S. Approximately 50 of these scientists have then returned to their countries with a prestigious NIH R01 grant. Alumni networks in key strategic countries such as Mexico, China, India, Brazil, and several Africa nations have served as a support system for researchers who return home and enabled them to maintain contacts which each other, well as their American counterparts, for the purpose of continuing to share expertise.

A strong imbalance in the flow of researchers and students between the U.S. and other parts of the world exists. Many come to the U.S. to take advantage of opportunities in scientific research and education, but few Americans take advantage of such opportunities overseas. To encourage U.S. researchers to learn from the best scientific minds in the world regardless of borders, some participants felt that the U.S. should consider instituting programs that would help researchers overcome the financial burden of going abroad and assure them an entry position for 1 or 2 years back in the U.S. S&E community when they return. At the same time, the initiative would facilitate a greater U.S. presence in international scientific developments and also heighten the profile of U.S. research abroad.

Potential Opportunities for New Modes of Participation

Pursuing partnerships beyond a bilateral framework

Participants mentioned that international S&E partnerships could be best pursued outside of the traditional bilateral framework. While many Federal agencies are most comfortable working on a country-by-country basis for cooperative efforts, participants noted that thinking beyond borders best facilitates science.

In some situations, participants stated that it is best to take a regional focus, or to form a partnership that is grounded on a problem that needs to be solved. For example, much headway has been made in Africa through a NIH initiative focused on malaria. The institutional premise for this partnership also provides a stronger basis for continued cooperation in the future and over the long-term. Participants noted that problem-based approaches that have an institutional framework for partnership and a regional focus are more successful in obtainment of their scientific objectives and also go further to attain the secondary goals of economic development and capacity-building.

The roles of the Department of State and USAID

Several participants suggested that science be given a higher priority at the Department of State. One suggestion was to establish 25 Science Advisor posts to the Ambassador at key U.S. embassies. By doing so, the Federal government would strengthen the value credited for S&E experience in the promotion criteria used at State. However, in order to truly establish Science Advisors as a serious career path, one participant said that the promotion boards at State should include more officers with functional experience, particularly those who have served in science-specific roles. That way, taking a science assignment will not potentially sideline one's career, as some participants feel is currently the case. Furthermore, a participant noted that the Department of State has funds for supporting science that helps meet foreign policy objectives and that this should be used as an instrument to promote the international progress of science.

During the day's discussions, a recent National Research Council report entitled *The Fundamental Role of Science and Technology in International Development: An Imperative for the U.S. Agency for International Development* was raised that recommended renewing the once significant scientific capacity at the USAID, that has been decimated over the last two decades.

The role of non-governmental organizations

Some participants discussed how non-governmental organizations (NGOs) are uniquely positioned to facilitate international S&E partnerships and have been somewhat overlooked as mechanisms for promoting the progress of science. Because these organizations are non-governmental by nature, they have more flexibility in working with governments and institutions that, for political reasons, do not want to be seen conducting work with or on behalf of the U.S. government. Non-profits and NGOs typically have several characteristics that make them a valuable asset to international S&E partnerships, according to representatives from the Smithsonian Institution, U.S. Civilian Research and Development Foundation (CRDF), and International Institute for Applied Systems Analysis (IIASA). They include:

- Ability to gain access to countries and research projects, regardless of political sensitivities;
- Ability to facilitate cooperation as a neutral body (IIASA is an example of this);
- Less restricted by intergovernmental procedures and protocol;
- Can leverage resources across borders and institutions; and
- Ability to operate with greater agility and less government bureaucracy.

While there are many ways in which institutions and other NGOs can function in cooperative agreements where governments cannot, one participant cautioned that they couldn't entirely replace government-to-government cooperation. Government-to-government efforts often lead to access to policy and policy makers that research carried out by NGOs does not allow. For instance, a participant noted how discussions on agriculture and biotechnology with a country could allow for direct conversations with government officials on intellectual property. This would not be possible without government-to-government cooperation.

The following draft summary does not necessarily reflect the positions of the National Science Board.

Appendix A: Agenda for the May 11 Hearing and Roundtable Discussion

NATIONAL SCIENCE BOARD
TASK FORCE ON INTERNATIONAL SCIENCE

HEARING AND ROUNDTABLE DISCUSSION
ON INTERNATIONAL SCIENCE PARTNERSHIPS

The George Washington University
The Elliott School of International Affairs
The Center for International Science and Technology Policy
1957 E Street NW 7th Floor, City View Room
Washington, D.C.
May 11, 2006

AGENDA

7:30 a.m. – 8:00 a.m. **Registration, City View Room**

8:00 a.m. – 8:10 a.m. **Opening Comments**

- Dr. Jon C. Strauss, Chair, Task Force on International Science
  - Purpose of the Hearing
  - Brief Overview of the Charge to the Task Force

8:10 a.m. – 8:20 a.m. **Welcoming Remarks**

- Mr. Stephen Joel Trachtenberg, President, George Washington University

8:20 a.m. – 8:30 a.m. **Introductions and Overview of Proceedings**

- Dr. Michael P. Crosby, Executive Officer, NSB
  - NSB-Sponsored Hearing Process
  - Self-Introduction of Hearing and Roundtable Participants

8:30 a.m. – 9:30 a.m. **Panel I – The Role of Mission Agencies in International Science Partnerships**

Focus Questions:

1. What is the current and potential role of mission agencies in supporting the international science partnerships described in the task force charge? [1]
2. Should these international science partnerships[1] be a more explicit objective of the mission agencies?
3. How best can these international science partnerships[1] be leveraged to support U.S. foreign aid objectives?

- Dr. William Brennan, Deputy Assistant Secretary for International Affairs, National Oceanic and Atmospheric Administration
- Mr. Al Condes, Deputy Assistant Administrator for External Relations, National Aeronautics and Space Administration
- Dr. James M. Short, Director, Defense Laboratory Management in the Office of the Secretary of Defense, Department of Defense

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9:30 a.m. – 10:45 a.m. **Panel II – Funding for International Science Partnerships**

Focus Questions:

1. Do Federal agencies have adequate funds and sufficient latitude in deploying funding, to successfully support these international science partnerships[1]?
2. Is the current level of collaboration and coordination between Federal agencies and non-governmental organizations (NGOs) adequate for achieving the full benefits of these international science partnerships[1]?
3. How best should funding for these international science partnerships[1] be deployed to encourage scientific capacity building in developing nations, while minimizing brain drain?

- Dr. Norman Neureiter, Director, Center for Science, Technology and Security Policy, AAAS
- Mr. Alessandro Damiani, Minister Councilor, Science, Technology and Education, European Union, Delegation of the European Commission
- Dr. Sharon Hrynkow, Acting Director, National Institute of Health, Fogarty International Center
- Dr. Marina Koch-Krumrei, Director, Washington Office, German Research Foundation

10:45 a.m. – 11:00 a.m. **Break**

11:00 a.m. – 12:15 p.m. **Panel III – The Role of Non-Governmental Organizations in International Science Partnerships**

Focus Questions:

1. What is the current and potential role of NGOs in supporting these international science partnerships[1]?
2. How can these international science partnerships[1] by utilized to create effective and sustainable improvements in science education in developing nations?

- Dr. David Evans, Under Secretary for Science, Smithsonian Institution
- Dr. Margaret Goud Collins, Program Officer, U.S. Committee for International Institute for Applied Systems Analysis
- Mr. Charles T. Owens, Senior Advisor, U.S. Civilian Research and Development Foundation
- Dr. Natalia Agapitova, Innovation Specialist, World Bank

12:30 p.m. – 1:30 p.m. **Lunch – Keynote Address** (*by invitation only*)

Dr. John H. Marburger, Science Advisor to the President and Director, Office of Science and Technology Policy

The University Club, 1918 F Street

The following draft summary does not necessarily reflect the positions of the National Science Board.

1:45 p.m. – 3:15 p.m. **Panel IV– Policy Perspectives on International Science Partnerships**

Focus Questions:

1. What is the current and potential role of the U.S. government is supporting these international science partnerships[1]?
2. Are these international science partnerships[1] of the highest priority for the U.S. government, and if so, is a government framework in place to support these partnerships?
3. Is the current U.S. visa process adequate for enabling these international science partnerships[1]?

- Senator Timothy E. Wirth, President, United Nations Foundation
- Dr. George H. Atkinson, Science and Technology Advisor to the Secretary of State, U.S. Department of State
- Mr. Owen Cylke, Member, National Research Council, Committee on Science and Technology in Foreign Assistance
- Dr. John P. Boright, Executive Director, Office of International Affairs, National Academy of Sciences

3:15 p.m. – 3:30 p.m. **Summaries of Discussions and Next Steps for the Task Force**

- Dr. Strauss
- Dr. Crosby

4:00 p.m. – 5:00 p.m. **Reception, City View Room** (*by invitation only*)

Welcoming Remarks

- Dr. Michael Brown, Dean, The Elliott School of International Affairs, The George Washington University

[1] National Science Board. *Charge to the Task Force on International Science*. September 19, 2005 (NSB-05-134).

This Board Hearing and Roundtable Discussion on May 11, 2006 will focus on the current and potential role of the U.S. Federal government in achieving the following international science partnership policy objectives, stated in the task force charge:

- facilitating partnerships between U.S. and non-U.S. scientists and engineers in the U.S.;
- facilitating partnerships between U.S. and non-U.S. scientists and engineers outside the U.S. in both developed and developing countries;
- utilization of science and engineering partnerships for improving relations between countries; and
- utilization of science and engineering partnerships for improving quality of life and environmental protection in developing countries.

The following draft summary does not necessarily reflect the positions of the National Science Board.

INVITED DISCUSSANTS

Dr. Michael Brown	Dean, The Elliott School of International Affairs The George Washington University
Ms. Cathleen A. Campbell	President and CEO U.S. Civilian Research and Development Foundation
Mr. E. Bruce Howard	Deputy Director, Office of Science and Technology Cooperation U.S. Department of State
Dr. Carol Linden	Senior Scientist, Office of Research and Development Department of Homeland Security
Dr. Kristin M. Lord	Special Adviser to the Under Secretary for Democracy and Global Affairs U.S. Department of State
Mr. Jeffrey A. Miotke	Chief of Staff to the Under Secretary for Democracy and Global Affairs U.S. Department of State
Mr. Franklin Moore	Director, Office of Environment and Science Policy U.S. Agency for International Development
Mr. Andrew Reynolds	Deputy Advisor, Office of the Science and Technology Advisor to the Secretary U.S. Department of State
Dr. Hratch G. Semerjian	Deputy Director National Institute of Standards and Technology
Dr. Nicholas Vonortas	Director, The Center for International Science and Technology Policy The George Washington University
Dr. William Walker	Senior Advisor for Biology U.S. Geological Survey
Dr. Thomas A. Weber	Director, Office of International Science and Engineering National Science Foundation

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Appendix B: Participant List for the May 11 Hearing and Roundtable Discussion

NATIONAL SCIENCE BOARD
TASK FORCE ON INTERNATIONAL SCIENCE

HEARING AND ROUNDTABLE DISCUSSION
ON INTERNATIONAL SCIENCE PARTNERSHIPS

George Washington University
Elliott School of International Affairs
1957 E Street 7th Floor, City View Room
Washington, D.C.
May 11, 2006

HEARING AND ROUNDTABLE PARTICIPANTS

Participant	**Affiliation**
National Science Board	
Dr. Jon C. Strauss	NSB Member, Chairman, Task Force on International Science
Dr. Dan E. Arvizu	NSB Member
Dr. Barry C. Barish	NSB Member
Dr. Steven C. Beering	NSB Member
Dr. Kelvin K. Droegemeier	NSB Member
Dr. Louis Lanzerotti	NSB Member
Dr. Alan I. Leshner	NSB Member
Dr. Kathryn D. Sullivan	NSB Member
Dr. Michael P. Crosby	NSB Executive Officer
Invited Hearing and Roundtable Participants	
Dr. Natalia Agapitova	World Bank
Dr. George H. Atkinson	U.S. Department of State
Dr. John P. Boright	National Academy of Sciences
Dr. William J. Brennan	National Oceanic and Atmospheric Administration
Dr. Michael Brown	The George Washington University
Ms. Cathleen A. Campbell	U.S. Civilian Research and Development Foundation
Dr. Margaret Goud Collins	International Institute for Applied Systems Analysis
Mr. Al Condes	National Aeronautics and Space Administration
Mr. Owen Cylke	NRC Committee on Science and Technology in Foreign Assistance
Mr. Alessandro Damiani	European Union, Delegation of the European Commission
Dr. David Evans	Smithsonian Institution
Mr. E. Bruce Howard	U.S. Department of State

Dr. Sharon Hrynkow	NIH Fogarty International Center

Participant	**Affiliation**

Invited Hearing and Roundtable Participants (continued)

Dr. Marina Koch-Krumrei	German Research Foundation
Dr. Carol Linden	Department of Homeland Security
Dr. Kristin M. Lord	U.S. Department of State
Dr. John H. Marburger	Office of Science and Technology Policy
Mr. Jeffrey A. Miotke	U.S. Department of State
Mr. Franklin Moore	U.S. Agency for International Development
Dr. Norman Neureiter	American Association for the Advancement of Science
Mr. Charles T. Owens	U.S. Civilian Research and Development Foundation
Mr. Andrew Reynolds	U.S. Department of State
Dr. Hratch G. Semerjian	National Institute of Standards and Technology
Dr. James M. Short	Department of Defense
Mr. Stephen Joel Trachtenberg	The George Washington University
Dr. Nicholas Vonortas	The George Washington University
Dr. Thomas A. Weber	National Science Foundation
Dr. William Walker	U.S. Geological Survey
Senator Timothy E. Wirth	United Nations Foundation