

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION**

HEARING CHARTER

International Science and Technology Cooperation

**Wednesday, April 2, 2008
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building**

1. Purpose

The purpose of the hearing is to examine the mechanisms by which federal priorities are set and inter-agency coordination is achieved for international science and technology cooperation, and to explore the diplomatic benefits of such cooperation.

2. Witnesses:

- **Dr. John H. Marburger III**, Director, Office of Science and Technology Policy.
- **Dr. Arden L. Bement, Jr.**, Director, National Science Foundation.
- **Dr. Nina V. Fedoroff**, Science and Technology Adviser to the Secretary of State.
- **Mr. Jeff Miotke**, Deputy Assistant Secretary of State for Science, Space and Health, Bureau of Oceans and International Environmental and Scientific Affairs.
- **Mr. Michael F. O'Brien**, Assistant Administrator for External Relations, National Aeronautics and Space Administration.

3. Overarching Questions:

- What is the scope of current efforts in international science and technology (S&T) cooperation? What is the scope of efforts in the Middle East and the developing world? To what extent is S&T cooperation integrated into our diplomatic activities in the Middle East and the developing world? What makes S&T cooperation successful as a diplomatic tool? What makes it unsuccessful?
- What are the respective roles of the Department of State, the U.S. Agency for International Development, the mission agencies (such as Department of Energy and

National Institutes of Health), and the National Science Foundation in international science and technology cooperation? How does each agency set its priorities for S&T cooperation? What is the role of the Office of Science and Technology Policy in fostering international science and technology cooperation and in coordinating federal activities?

- How is interagency coordination of international S&T cooperation currently achieved? In what ways could interagency coordination be improved? Is there value in reinstating the Committee on International Science and Technology under the National Science and Technology Council? In what other ways can the federal government increase and improve the use of S&T in its diplomatic missions?

4. Overview

Science and technology were closely tied to American diplomacy in the early years after the founding of the United States. In fact, the first Secretary of State, Thomas Jefferson, was also designated the administrator of the nation's first patent law, and the first efforts to establish a bureau of weights and measures were also associated with the Department of State. By the 1830's, this close relationship between diplomats and scientists seems to have diminished. It was not until World War II that science and technology (S&T) once again began to play a prominent role in the State Department. Nevertheless, the U.S. continued to engage in international science and technology cooperation for other purposes. For example, the first International Polar Year, a coordinated international effort to collect and analyze data about the polar regions, occurred in 1882-83. We are currently in the middle of the third International Polar Year.

There are a number of reasons why the United States has and will continue to engage in international science and technology (S&T) cooperation, including:

- to strengthen U.S. science by providing our own scientists access to the best scientists and research sites around the world;
- to enable construction of and participation in prohibitively expensive world-class research facilities (either on U.S. soil or foreign sites) by partnering with foreign countries to leverage their funds and scientific talent;
- to address U.S. interests in global matters, such as nonproliferation, water resources, climate change and infectious diseases, in part by ensuring that foreign and international (e.g. U.N.) decision makers have access to the best science;
- to help build technological capacity and address health and resource crises in other countries in order to help maintain U.S. national security and economic interests; and
- to help build more positive relationships with other countries – what is often called “science diplomacy.”

This is certainly not an exhaustive list nor the only way to break down the rationale for engaging in international S&T cooperation. One former State Department official prefers the following categories: science for science's sake; science for the decision maker; science for development; and science for diplomacy. The witnesses for this hearing are likely to provide their own lists of reasons why the federal government broadly, or their respective agencies specifically, engage in S&T cooperation.

In addition to the Department of State and the U.S. Agency for International Development (USAID), every Federal agency that either does its own research or funds academic research (or in most cases, both) supports international S&T cooperation, including Departments of Agriculture, Defense, Energy, Commerce (includes NIST and NOAA), and Health and Human Services (includes NIH) as well as NASA, the Environmental Protection Agency, and the National Science Foundation (NSF). The Office of Science and Technology Policy advises the President on matters of science and technology as they relate to international issues, and provides intellectual support to the Department of State and USAID on S&T matters. State and USAID also turn to NSF and the mission agencies for intellectual input on S&T-related issues that fall within those agencies' areas of expertise, such as health, energy or water. The mission agencies, on the other hand, turn to the Department of State for assistance in negotiating formal agreements with other nations. A more detailed description of the different agencies' roles is provided below.

The National Science Board (NSB) recently issued a report, "International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and our Nation's Innovation Agenda,"¹ in which the Board makes a series of recommendations for increased coherence and coordination of federally sponsored international science and engineering activities.

5. Roles of Federal Agencies

Office of Science and Technology Policy

The Director of the Office of Science and Technology Policy (OSTP) is, by statute, the President's adviser on science and technology matters for all areas of national concern, including foreign relations and national security, as well as for "emerging international problems amenable to the contributions of science and technology."

The OSTP Director, through the National Science and Technology Council, is also responsible for interagency coordination of federal research and development programs, which includes programs, such as the International Polar Year, that are part of an international partnership. But OSTP does not have an explicit mandate for coordination of all international activities, nor does the office have any program budget or management responsibilities of its own.

The NSB report mentioned previously calls on OSTP to take a more active and prominent role both in setting federal priorities for international science and engineering cooperation

¹ <http://www.nsf.gov/nsb/publications/2008/nsb084.pdf>

and in coordinating efforts across agencies. For example, the Board recommends that OSTP “should directly charge Federal agencies to include specific components of international R&D in their integrated programs” and urges the National Science and Technology Council to reestablish a Committee on International Science, Engineering and Technology (CISET). Staff participated in conversations in which three former high-level officials familiar with CISET during the Clinton Administration (it was dissolved in 2000) expressed concern that a new CISET would have the same difficulty as its predecessor in carving out a unique role for itself, but did add that it was a useful place for information sharing across agencies. One of the CISET subcommittees, for example, developed an inventory of all federal S&T programs related to developing countries. No other organization has taken on responsibility for updating that inventory.

National Science Foundation

The National Science Foundation (NSF) supports science for science’s sake; like the other research agencies, NSF’s mission does not include diplomacy or development, although it certainly supports research in many areas that are critical to policy makers across the globe. NSF has an Office of International Science and Engineering (OISE), housed within the Office of the Director. In addition to having region-knowledgeable staff at NSF headquarters, OISE manages three overseas offices in Paris, Tokyo and Beijing. The FY 2009 budget request for OISE is \$47 million, a 15 percent increase over planned spending for FY 2008. Approximately \$10 million of the OISE budget goes to the Office of Science and Technology Policy (OSTP) to pay dues in international organizations. The rest of the research budget goes toward two types of international science and engineering collaboration: support for U.S. scientists to travel to foreign sites for collecting data and scientist-to-scientist collaboration. NSF does not fund foreign researchers directly.

In particular, OISE supports:

- International research experiences for U.S. undergraduate and graduate students;
- Doctoral dissertation enhancement projects for U.S. students at foreign sites;
- International postdoctoral research fellowships;
- Partnerships for International Research and Education (PIRE) grants of \$500,000 per year for five years for the development of models for long-term international partnerships; and
- International planning visits and workshops.

In addition to supporting such activities directly, OISE helps facilitate and provide some supplementary funds for international research collaborations supported by all NSF directorates. According to NSF, the agency in total supports \$300-\$400 million annually on research grants involving international collaborations. In addition, NSF can support the Department of State and non-governmental foundations (such as the Civilian Research and Development Foundation) by helping to identify leading academic scientists and engineers (U.S. and foreign), reviewing proposals, and otherwise providing intellectual support and credibility.

Department of State

The Department of State has S&T diplomatic strategies related to a number of international issues, including water management, energy, agriculture, natural resource management, infectious diseases and biodiversity. It also promotes international scientific cooperation through bilateral and multilateral science and technology agreements to “promote the precepts of sustainable development, enhancement of the role of women in science and society, science-based decision-making, good governance, and global security more broadly.”

The Bureau of Oceans, International Environmental and Scientific Affairs (OES) is responsible for coordinating the formal S&T agreements. There are currently 39 formal bilateral agreements, most of which are not funded and some of which are inactive altogether. Some of the newest agreements, including an agreement not yet signed with Saudi Arabia, are part of a State Department policy to enhance relations with the Middle East.

Distinct from OES is the Office of the Science and Technology Adviser (STAS)². Dr. Nina Fedoroff became the agency’s third S&T Adviser in July, 2007. The goals of STAS are to enhance S&T literacy throughout the Department; build partnerships with the S&T community; provide accurate S&T advice to the Department; and help shape a global perspective on the emerging S&T developments anticipated to affect current and future U.S. foreign policy.

U.S. Agency for International Development

The U.S. Agency for International Development (USAID) is the primary agency supporting science for development. Many USAID initiatives on S&T related issues, such as infectious diseases, energy, natural resources management, and agriculture, draw on or build up local and regional S&T capacity in addition to contributing American know-how and resources.

USAID used to have a separate Bureau for Science and Technology, but several years ago that Bureau was dismantled and the science and technology activities spread among the appropriate functional and regional bureaus. However, when Dr. Fedoroff was appointed Science and Technology Adviser to the Secretary of State, she convinced Secretary Rice to assign to her the additional role of S&T Adviser to USAID Administrator Henrietta Ford.

Mission Agencies

Aside from NSF, the National Institutes of Health (NIH) and the USDA are the only research agencies with explicit international programs. In fact, NIH has a separate

² The Secretary of State’s Advisory Committee on Transformational Diplomacy: State Department in 2025 Working Group recently issued a report that includes a discussion of how S&T could be better integrated into the State Department. The working group raised concerns about having a science adviser outside of OES and without any real power of her own, and suggested that the same person could serve as both Science Adviser and the Assistant Secretary for OES, or alternatively that the Science Adviser could be the Principal Deputy Assistant Secretary in OES. (<http://www.state.gov/documents/organization/99879.pdf>)

Fogarty International Center for Advanced Study in the Health Sciences, which addresses global health challenges through collaborative research and training programs and international partnerships. USDA has many international programs, including international offices and overseas laboratories, in addition to the Foreign Agriculture Service.

The remainder of the mission agencies also engage in international science cooperation, but wrap those projects into their domestic programs rather than having separate programs or offices. NASA in particular has international partners for most of its big projects due to the tremendous costs of building and launching into orbit the kinds of telescopes and other research and exploration equipment required for their mission. All of these domestic mission agencies are careful to state that they only engage in science cooperation for the sake of science and do not have or want a role in diplomacy or development.

6. Questions for Witnesses

Dr. Marburger

- What is the role of the Office of Science and Technology Policy (OSTP) in fostering international science and technology (S&T) cooperation and in coordinating federal activities? What is OSTP's role relative to that of the Department of State?
- How does the Administration set priorities for international S&T cooperation? Is there any regular, forward-looking process by which goals are set by OSTP or by the National Science and Technology Council (NSTC)? What is your response to the National Science Board's recommendation to reconstitute the Committee on International S&T under NSTC?

Dr. Bement

- What is the role of the National Science Foundation (NSF) in fostering international science and technology cooperation? What is NSF's role relative to that of the Department of State and of the mission agencies? To what extent does NSF coordinate its efforts with other agencies?
- How does NSF set its own priorities for international collaboration? How does the Office of International Science and Engineering coordinate its activities with the various research directorates?
- What is the extent and nature of NSF supported collaborations in the Middle East and in the developing world? How can NSF best support the growth of science and engineering research capacity in developing countries without compromising its own rigorous merit review system? Does, or could, NSF play any role in institution building – that is in helping to build NSF-like organizations – in such countries?

Dr. Fedoroff

- What is the role of the Science and Technology Adviser to the Secretary of State in fostering international science and technology (S&T) cooperation? What is the role of your office relative to that of the Bureau of Oceans, Environment and Science?
- How do you coordinate your efforts with other agencies, including the Office of Science and Technology Policy, the National Science Foundation, and the mission agencies? How do you coordinate your efforts with non-governmental science organizations such as AAAS and The National Academies, and with private foundations?
- What is the Science and Technology Adviser's role at the U.S. Agency for International Development (USAID)? What is USAID's role in international S&T cooperation and how does it differ from that of the State Department?
- What makes S&T cooperation successful as a diplomatic tool? What makes it unsuccessful? To what extent is S&T cooperation currently integrated into our diplomatic activities in the Middle East and the developing world? How could the federal government make more effective use of S&T in its diplomatic activities?

Mr. Miotke

- What is the role of the Department of State in fostering international science and technology (S&T) cooperation? What is the role of the Bureau of Oceans and International Environmental and Scientific Affairs (OES)? How does OES set priorities for S&T cooperation?
- How does OES coordinate its efforts with other agencies, including the Office of Science and Technology Policy, the National Science Foundation and the mission agencies? How do you coordinate your efforts with non-governmental science organizations such as AAAS and The National Academies, and with private foundations?
- What is the extent and nature of OES sponsored S&T collaboration in the Middle East and in the developing world? What benefits have you seen from your S&T efforts in those regions? In what ways might OES better engage and leverage the U.S. science and engineering enterprise in its diplomatic activities, especially in the Middle East and the developing world?

Mr. O'Brien

- Please provide an overview of the types of international science and technology partnerships and cooperative agreements in which the National Aeronautics and Space Administration (NASA) participates. Does NASA have any presence in the developing world?

- Why does NASA engage in international science and technology cooperation? What are the benefits to NASA and to the broader scientific community? How and based on what criteria does NASA set its priorities for international cooperation?
- What are the roles of other agencies, including the Department of State and the Office of Science and Technology Policy, in supporting or helping to develop NASA's international activities? Does the process of working with the Department of State to negotiate science and technology agreements with other countries work well? Do you have any recommendations for how this process could be improved?