

**National Science Foundation**  
**Advisory Committee for International Science and Engineering**

September 20-21, 2010

**MEETING MINUTES**

Members Present:

Saifur Rahman, Chair AC-ISE  
Howard Alper  
Jean-Pierre Ezin  
Roddam Narasimha  
Jeanne L. Narum  
Maresi Nerad  
Barbara Olds  
Kevin Pilz  
Ismail Serageldin  
Nicholas Vonortas  
Daniel Wubah  
Lilian Wu  
George Middendorf, CEOSE Liaison

[A listing of Advisory Committee Member affiliations is attached.]

The Advisory Committee for International Science and Engineering (AC-ISE) met at the National Science Foundation, Arlington Virginia, in Stafford II Room 555, on September 20 and 21, 2010.

**MONDAY, SEPTEMBER 20, 2010**

Welcome, Introductions, Review of Meeting Objectives

Dr. **Larry Weber**, Director of the Office of International Science and Engineering (OISE), called the meeting to order at 9:00 a.m. He announced that Dr. **Saifur Rahman** had accepted the role of Chair of the AC-ISE. He welcomed three new members who were attending an AC-ISE meeting for the first time: **Howard Alper**, **Roddam Narasimha**, and **Maresi Nerad**. Dr. Weber noted that AC-ISE members **Lueny Morell** and **Janis Weeks** were not able to attend the September meeting.

Dr. Weber announced that this would be the last meeting for **Ismail Serageldin** and **Lilian Wu**, whose terms expire at the end of September. **Gretchen Kalonji**, immediate past chair of AC-ISE, recently accepted the position of Assistant Director-General for Natural Sciences at UNESCO in Paris, and has resigned from the committee. Dr. Weber expressed his appreciation for their service.

Dr. **Saifur Rahman**, AC-ISE Chair, reviewed the meeting agenda and encouraged members to be candid and open in the breakout discussions. He asked the participants to consider four general themes and incorporate them into discussions as appropriate: Muslim-majority countries, science diplomacy, cyber-infrastructure, and diversity and broadening participation.

Update on OISE, NSF, International Engagements, and Recommendations from April 2010 AC-ISE Meeting

Dr. Weber summarized senior staff transitions at NSF and OISE since the last AC-ISE meeting.

Dr. Weber described the status of four solicitations managed by OISE:

- A revised *East Asia and Pacific Summer Institutes for U.S. Graduate Students* (EAPSI) solicitation was released in August 2010 - [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5284](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5284)
- *Catalyzing New International Collaborations* will replace the former International Research and Education: Planning Visits and Workshops solicitation. [The solicitation was released on October 1, 2010 - [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12815](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12815)]
- A revised *International Research Experiences for Students* (IRES) solicitation is expected to be released soon.
- The fourth *Partnerships for International Research and Education* (PIRE) solicitation is expected to be released in early calendar year 2011.

OISE is now actively involved in reviewing all NSF proposal generating documents that have an anticipated and clearly defined international dimension/component. An illustrative list was presented of such opportunities involving six directorates and cross-directorate activities that had been released or are under discussion since April 2010. The “NSF Policies and Practices for International Engagements” document, described at the April AC-ISE meeting, is being integrated into NSF policy documents and OISE is working with the NSF Policy Office to disseminate information to NSF staff.

Dr. Weber briefly described the OISE FY 2011 budget request currently under consideration by Congress. An 11.4 percent increase from the 2010 estimate is requested (\$53.26 million). In addition to increases for the International Research Fellowship Program and IRES, \$5 million will support new areas of emphasis for Muslim-majority countries and for developing countries.

Three NSF policy refinements, mandated as part of the America Competes Act, were described:

- Each institution applying for NSF funding must include a plan for training undergraduate and graduate students and postdocs in responsible conduct of research. Resource materials are being made available on the NSF Web site (<http://www.nsf.gov/bfa/dias/policy/rcr.jsp>).
- Research results must be made available to the public in a timely manner. As part of their final project reports, principle investigators will prepare a summary of results, without NSF involvement or editing, and will post them on the Research.gov Web site.

- A National Science Board Task Force on Merit Review will review the use and utility of the two NSF proposal review criteria. OISE is asking that a new criterion for international engagements be considered.

NSF international engagements in science and engineering are advancing overall U.S. diplomacy and cooperation with other nations. Dr. Weber provided several examples including: collaboration with G8 Research Councils on a multilateral research funding mechanism, a symposium on transatlantic EU-U.S. cooperation on large scale research infrastructures, and a Global Science Forum on engagements with developing countries.

#### Committee of Visitors (COV): Update on Implementation of COV Recommendations from 2008

Dr. **Mark Suskin**, Executive Officer, OISE, summarized the COV process and OISE's accomplishments in response to recommendations from the 2008 COV review of OISE. The COV is a panel of external experts that conducts an in-depth review of program activities, and reports on the quality and integrity of proposal decisions, outputs, and outcomes. Each NSF program is required to be reviewed by a COV every three years. There were 18 COVs conducted across NSF in 2009, many involving multiple program activities.

The 2008 OISE COV was established as a subcommittee of the AC-ISE. Two AC-ISE members (Barbara Olds, chair, and Lueny Morell) served along with 9 other external experts. The 2008 OISE COV met for 3 days, reviewed 132 proposal actions, and made 21 recommendations (<http://www.nsf.gov/od/oia/activities/cov/oise/2008/Report.pdf>).

As required by COV guidelines, OISE management responded to each of the COV recommendations (<http://www.nsf.gov/od/oia/activities/cov/oise/2008/Responses.pdf>).

Dr. Suskin described some of OISE's additional responses to the COV recommendations since the 2008 report:

- OISE proactively explores collaborations with other funding organizations. An OISE AAAS Fellow will be detailed to USAID in fall 2010 to develop actionable elements of a Memorandum of Agreement.
- OISE partners with primarily undergraduate institutions and community colleges. An OISE award to a community college was included in a report to the Vice President as one of NSF's best ARRA-funded projects.
- OISE is exploring expansion of EAPSI-like programs into other regions of the world, including India.
- OISE has worked with the NSF Graduate Research Fellowship program to partner with counterpart agencies in Scandinavian countries.

#### Planning for COV in 2011

Dr. **Robert Webber**, AC-ISE Executive Secretary, explained that OISE is scheduled for a COV review during FY 2011. The COV will be established as a subcommittee of the AC-ISE and at least one member of the COV must be a member of the AC-ISE. Dr. Webber invited AC-ISE members to contact him if they would like to serve on the COV.

## Overview of Activities related to AC-ISE Working Groups

In April 2010, the AC-ISE established three Working Groups (WGs) to provide advice on three priority issues: International Programs, Developing Countries, and Strategic Planning. At the September 2010 meeting, each WG topic was addressed in three separate, non-contiguous sessions on the agenda.

1. In the first session, with all available AC-ISE members in plenary attendance, the OISE Liaison to each Working Group gave an overview of relevant activities since the April 2010 AC-ISE meeting.
2. The second WG session involved separate concurrent breakout sessions. Dr. Rahman asked each WG to review their charge, define the scope of topical coverage, identify anticipated actions, and establish a schedule of teleconferences and reports. [The charge and membership of each Working Group is attached.]
3. In the third WG session, again with all AC-ISE members in plenary attendance, each WG chair engaged the full AC-ISE in a substantive discussion focused on issues identified by the WG.

For convenient reference, these meeting minutes will summarize discussions of each WG in turn, regardless of chronological order on the published AC-ISE agenda.

### International Programs Working Group (IP-WG) – OISE Liaison Overview

Dr. **Elizabeth Lyons**, OISE Liaison to the IP-WG, announced that the scope of the IP-WG has expanded beyond its initial focus on the PIRE program. The IP-WG will provide guidance and suggestions regarding the balance, scope, and impact of NSF's broad portfolio of international programs. Initial consideration will focus on OISE-managed programs, but then be expanded to include all NSF activities with international components.

Dr. Lyons explained that OISE support can be provided for all NSF-funded disciplines. To facilitate the AC-ISE discussion, Dr. Lyons summarized each of the OISE-managed programs and presented a table illustrating the levels of involvement of different types of people, and the different types of activities supported within each program.

*Partnerships for International Research and Education (PIRE)* grants are targeted to faculty, post-docs, and graduate students. They explore frontier research requiring international partnerships and encourage student engagement in international research. PIRE investments are also intended to enhance international activities at the institutional level. The size and duration of PIRE grants are from \$1.2M over 4 years to \$6.5M over 6 years.

*Catalyzing New International Collaborations* grants are targeted to faculty and students. They include planning visits, preliminary data gathering, network building, and/or workshops to get new collaborations started. The expected outcome of these grants is an NSF proposal. Typically, these grants will range from \$10K to \$100K, for a maximum of two years.

*International Research Experiences for Students (IRES)* awards target graduate and undergraduate students. They include focused international research experiences for small

groups of students. The expected outcomes are globally-engaged students, faculty, and institutions. Awards can be up to \$150K for up to 3 years.

*East Asia and Pacific Summer Institutes* (EAPSI) grants target graduate students. Activities include 8-week summer research experiences in Australia, New Zealand, Korea, China, Singapore or Taiwan (EAPSI in Japan are 10 weeks). The expected outcomes are international collaborations and networks. They consist of \$5K stipends and travel. Living costs in-country are provided by the host agency.

*Pan-American Advanced Studies Institutes* (PASI) awards target graduate students, post-doctoral researchers, and some faculty. Activities include short courses (2 to 4 weeks) to stimulate collaboration in the Americas in math, physical, geological, computer, biological sciences and engineering. The expected outcomes are new collaborations and strong regional networks. These grants are up to \$100K for 1 year. The Department of Energy and NSF share funding of PASI.

The *International Research Fellowships Program* (IRFP) targets post-doctoral researchers. Activities consist of collaborative research at foreign locations for 9 months to 2 years. The expected outcomes include international collaborations, top-flight research, and international networks. Grants are up to \$200K for stipend, travel, and research support.

OISE is involved in several multi-national organizations including: the Human Frontiers Science Program; OECD Global Science Forum; International Council for Science; International Institute for Applied Systems Analysis; International Neuroinformatics Coordination Facility; and the U.S. Civilian Research and Development Foundation. Activities may involve a U.S. contribution that supports organizations, grant-making, research, and facilities. The expected outcomes consist of high-level cooperation, organizational support, research excellence, and training. Most awards are for 5 years and range from \$350K to \$2.5M annually.

OISE actively works with other NSF units to share funding for international components of their grants. The expected outcomes are international collaborations, top-flight research, networking, novel international education projects, and more internationalized U.S. institutions. OISE co-funding is typically up to \$100K per award.

Dr. Lyons encouraged input from the Committee on each program, specifically on the appropriateness and coverage of the target groups.

#### International Programs Working Group – Concurrent Breakout Session

Ms. **Jeanne Narum**, Chair of the IP-WG, suggested that the group focus on just a few major concepts for discussion and identify a couple major issues to report back to the full Committee. She asked the Working Group to identify concepts the group can work on between Advisory Committee meetings. Dr. Weber asked the Working Group to consider specific activities that OISE should fund in order to catalyze proposals to the research directorates for future NSF funding.

Dr. Roddam Narasimha described his experiences working with Indian researchers and noting how personal contacts can have positive impacts on igniting new collaborations. He explained how his own experience as a graduate student in the U.S. led to long-term collaborations with U.S. researchers and that the compatibility between U.S. and foreign researchers was a key element to the strength of the collaboration. Dr. Narasimha stated that joint research projects should be a goal of OISE funding, and that grant applicants should specifically address how they and their collaborator complement each other.

Dr. Maresi Nerad stated that face-to-face personal interactions, followed by cyber-interactions, and overseas experiences, of at least six months, are the best ways of helping researchers build positive connections with international collaborators. She noted that understanding science culture in the context of a foreign culture is an important part of catalyzing future collaborations. She supported emphasis on junior researchers and suggested aiming to have at least one-third of the catalytic activities support early-career scientists. She also encouraged OISE to coordinate funding with foreign counterparts so that all participants in a collaboration are funded.

Dr. Lillian Wu suggested that OISE ensure that a foreign counterpart provide some sort of support to the foreign researcher. She also suggested that NSF be more transparent about how OISE and the rest of NSF interact in the process of reviewing international activities.

Ms. Narum stated that the Catalyzing New International Collaborations solicitation has merit, and asked the group to consider major points that could be shared with the larger group. Suggestions were that programs focus on building trust and active collaborations of mutual benefit, that they target junior researchers, and that they consider whether foreign support for collaboration exists. In catalytic proposals there needs to be enough detail for PIs to explain, and for NSF to evaluate, how a catalytic activity may result in future support. When these criteria are met, the likelihood of a follow-on successful international collaboration increases.

Dr. Lyons asked the group to consider what characteristics of various universities have led to strong international activities, especially catalytic activities. Ms. Narum indicated that one thing that universities can contribute in this general area is their knowledge of where students have gone after graduation – so that it may be possible to track them and look at their level of international engagement later in their careers.

#### International Programs Working Group – Plenary Discussion

Ms. Narum invited IP-WG members to comment on the breakout session discussions.

Dr. Narasimha reflected on his personal experiences in catalyzing long-term international collaborations and emphasized: (a) the need for mutual respect and trust, (b) identifying opportunities that benefit both sides, (c) involving participants from multiple education levels, (d) formulating a two-page preliminary proposal of what each side brings to the table in order to invite more detailed proposals, and (e) funding commitments from all participating countries.

Dr. Nerad stressed: (a) the importance of continuing support for face-to-face preliminary meetings (remote communications do have limitations), (b) at least one third of the participants should be early-career researchers, and (c) more coordination with foreign agencies.

Dr. Wu remarked that Canada is an exemplary collaborator – they don't expect unrealistic outcomes and they discuss things easily. She underscored: (a) the importance of mutual respect, trust, and understanding among all parties, (b) the value of involving young scientists, and (c) enthusiastic commitments, though not necessarily funding, from other partners. To ensure the proposal's credibility, relevant directorates should be involved early in the review process.

#### Developing Countries Working Group (DC-WG) – OISE Liaison Overview

Drs. **Jessica Robin** and **Mark Doyle** acted as liaisons to the DC-WG on behalf of Dr. **DeAndrea Beck**, OISE Liaison to the DC-WG, and Program Officer for Developing Countries. They presented an update on OISE initiatives with developing countries and how grants through several programs have specifically targeted developing countries. Dr. Robin described a high-level dialog with USAID on transforming development through science, technology, and innovation. The Basic Research to Enable Agricultural Development (BREAD) program recently made 15 awards to U.S. institutions, 11 of which are collaborating with developing countries who are receiving Gates Foundation sub-awards. The OISE PIRE program recently made 15 awards, 4 of which involve working with developing countries. Dr. Robin presented a spreadsheet of NSF awards involving collaboration with 70 developing countries that is being used for briefings, and for program planning and analysis. She explained new strategies for exploring opportunities to work with developing countries, such as partnering with multilateral development banks, private foundations, industry, and foreign governments.

Dr. Doyle will begin a three-month detail to USAID this fall. He presented a graphic that showed the overlap between NSF and USAID programs in developing countries and explained how each agency might collaborate to achieve mutually beneficial goals. Dr. Doyle described the Partners in Science for Development (PSD) program as a USAID/NSF joint initiative that is currently in the advanced planning stages. PSD will invite developing country collaborators of U.S. PIs with current NSF awards to apply for collateral funding from USAID to support their research, training, and development goals. PSD is intended to accomplish two main objectives: (1) USAID support for developing country scientists will address the funding gaps that often hinder full research collaboration, and (2) funding for developing country scientists and their students will expand the dimensions of NSF-funded awards to include development and capacity building. Dr. Doyle invited input from the Advisory Committee on how NSF and USAID might best collaborate.

#### Developing Countries Working Group – Concurrent Breakout Session

Dr. **Daniel Wubah**, Chair of the DC-WG, invited members to comment on USAID initiatives and how they interact with NSF.

Dr. Serageldin commented that there is a need to get input from U.S. PIs who perform research in developing countries.

It was noted that developing countries need different systems, and that mechanisms that target institutional support should be project-specific to build capacity. Dr. Harold Stolberg, OISE Program Coordinator for the Americas, commented that the nature of science in developing countries is more multidisciplinary, and there is great interest in gaining access to high speed data networks. Dr. Ezin mentioned that lack of access to cyberinfrastructure and secure networks have had negative effects on research efforts in Africa. Dr. Serageldin cited a relevant study, which he co-chaired, entitled “Inventing a Better Future: A Strategy for Building Worldwide Capacities in Science and Technology”  
<http://www.interacademycouncil.net/?id=9988>.

Dr. Pilz suggested that award amounts should depend on individual projects (not fixed funding), and that projects be of varied length. He said that USAID does not cover institutional costs, but there may be some opportunities there. For example, overhead in Egypt is 15 percent, and USAID negotiates the rate with each individual country. Dr. Wubah stated that donors consistently refuse to fund overhead and institutional costs. Dr. Stolberg mentioned that labor laws in foreign countries must be considered.

Dr. Serageldin suggested a new mechanism for number-crunching projects. Many USAID studies award U.S. consultants and companies at a much higher cost than hiring locals to do the same job. Outsourcing segments of awards to developing countries would lower costs and have the side-benefit of developing capacity. This would also free up funds for other projects. An alternative is to provide sub-awards to foreign institutions associated with the U.S. PI.

Dr. Serageldin suggested targeting specific institutions around the globe which can then become hubs to help identify promising scientists and projects. This can also lead to lasting relationships between institutions. There was general agreement that some issues are better addressed by institutions than by individuals.

It was suggested that awards be made to U.S. institutions to host postdoctoral students or faculty from developing countries, or to develop training materials and curricula. NSF and USAID should ensure that developing country scientists are engaged in true intellectual collaboration, and that the project is well coordinated with the U.S. PI's research. The merit of the institutions should be considered, and USAID should deal with technically focused institutions and areas of common interest.

#### Developing Countries Working Group – Plenary Discussion

Dr. Wubah opened the discussion by noting the importance of high-speed internet service for developing countries, and how the GLORIAD network is helping provide access.

Dr. Serageldin commented that some of the cross-cutting themes require that institutional collaboration supplement individual collaboration. This can be based on centers of excellence that create virtual networks among regional scientists and identify new scientists. He warned that overhead is a sensitive issue – in the U.S., 50 percent overhead is typical among universities,

yet foreign partners are often limited to 15 percent by grants. Outsourcing can be a mechanism for U.S. institutions to save money and build local capacity abroad.

Dr. Pilz asked what will guide OISE's investment priorities for Muslim-majority and developing countries. Dr. Weber replied that existing programs will give extra emphasis to proposals coming from Muslim-majority and developing countries, but that there is no solicitation specific to those countries.

Dr. Middendorf remarked that building enduring long-term relationships requires frequent contact and language skills.

Dr. Alper urged NSF to pursue international partnerships with excellence as its signature and sustainability as its goal.

Dr. Tsapogas expressed appreciation for comments about the difficulty of choosing appropriate indicators of the success of international initiatives, and reported that OISE is learning from the evaluation of the IRFP and EAPSI programs. It was noted that the international community should know where "exchange students" are located and be able to track their careers. This will greatly facilitate program evaluations. Dr. Alper reported that Canadian research applications require tracking and reporting activities of former colleagues for up to six years. Dr. Narasimha commented that the Max Planck Institute keeps in touch with its foreign students.

#### Strategic Planning Working Group (SP-WG) – OISE Liaison Overview

Dr. **John Tsapogas** thanked the Committee for its comments (in April) on the new draft NSF Strategic Plan for FY 2010-2015. He noted that the current draft Plan has incorporated public comments and is expected to be approved soon. He provided an overview of the new NSF Strategic Plan for FY 2010-2015, explained how the Plan has increased emphasis on international engagement and partnerships, and strives for broad global impacts. Dr. Tsapogas asked the committee for input on several issues: how OISE's current strategic plan should align with NSF's new strategic plan, how OISE can better assess how well NSF is achieving its goals, and on which emerging issues OISE should focus over the coming years.

#### Strategic Planning Working Group – Concurrent Breakout Session

Dr. **Nicholas Vonortas** acted as Chair of the SP-WG in Dr. **Lueny Morell**'s absence. He noted that the draft NSF Strategic Plan for FY 2010-2015 has an explicit international focus, which is real progress compared to the current plan. However, he observed that the international focus is rather passive as opposed to proactive with a real engagement commitment. Dr. Alper remarked that despite numerous mentions of "international" in the NSF Plan, the real issue is how to sustain U.S. leadership in a rapidly evolving new world of fast growing actors.

Dr. Rahman asked how OISE can be more proactive. For example, Columbia is establishing a partnership with Brazil, but faced with limited technical capacities, they turned to Virginia Tech for assistance. Dr. Vonortas suggested looking at experiences in the private sector.

Dr. Middendorf suggested that the U.S. needs to train U.S. scientists to engage with foreign counterparts by providing opportunities for networking and long-term commitments, offering language training, and introducing an education element focusing on partners' needs and considering which research area should be targeted to strengthen education. While some institutions do better than others, overall, there is limited follow-up with foreign students trained in the U.S. after they leave. AC-ISE members noted that foreign students can be great ambassadors for U.S. science and technology, and that "alumni" of NSF international programs could be convened through meetings, databases, or listservs. Other members remarked that universities are unlikely to share foreign student contacts with each other, and that NSF is so focused on new funding that it is hard to take advantage of past activities. The emergence of Brazil, China, India, and South Africa in science and technology was noted and other countries are turning to them for training rather than to the U.S.

Regarding language training, one member felt that other countries are so well versed in English that language is not a real handicap, even if this may be less true in the earlier stages of collaboration. Another member responded that language is key to achieving a higher degree of collaboration and connecting beyond the scientific basics.

Dr. Vonortas invited suggestions for streamlining bilateral and multi-lateral funding agreements to leverage funds more effectively. Dr. Alper recommended looking at the International Development Research Centre (IDRC) as a model. The BREAD (Basic Research to Enable Agricultural Development) and USAID MOU were also offered as potentially effective approaches.

Dr. Tsapogas noted that the NSF Strategic Plan emphasizes evaluation as important to understanding program effectiveness and shaping future initiatives. Several members agreed that indicators are needed to track implementation of the strategic plans. He emphasized that NSF and OISE should seize the opportunity to do more in the international arena, and reminded the WG that their input is needed to revise the OISE Strategic Plan and align it with the new NSF Strategic Plan.

#### Strategic Planning Working Group – Plenary Discussion

Dr. Vonortas observed that the new NSF Strategic Plan is much improved on the international dimension, but that it could be more proactive. Opportunities for NSF to maintain or achieve U.S. global leadership include: (a) providing network opportunities, (b) encouraging language training for effective communications, and (c) leveraging foreign presence in the U.S. by maintaining contact and energizing effective interactions. He commented on the new and expanding role of foreign campuses of U.S. universities.

Dr. Alper remarked that foreign students trained in the U.S. should be considered science ambassadors and used as strong linkages for networking abroad. Several members recommended developing mechanisms for tracking U.S. and foreign researchers after their exchange visits and finding ways to benefit from their experiences.

Dr. Rahman suggested that NSF host a workshop on best practices for linking U.S. and foreign institutions, sharing experiences, and facilitating interactions.

The AC-ISE needs to reexamine current OISE goals and activities, and ensure that they are congruent with the new NSF Plan. It is important to assess OISE activities against goals and demonstrate progress, or if necessary, adjust programs to promote progress.

Lunch with Kerri-Ann Jones, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, U.S. Department of State

Dr. **Kerri-Ann Jones** briefly described the role of science and technology in foreign policy at the Department of State (DOS), and then invited comments and questions from AC-ISE members. Science is needed to obtain sound data and to support good decisions. Science is used as an essential tool to address grand problems, such as: climate change, global health, agriculture and food security, and water issues. Dr. Jones reported that the Secretary of State promotes the “3 D’s” – diplomacy, defense, and development. She observed that development is often able to elevate both diplomacy and defense. Science diplomacy is recognized as an effective means of building relationships with other countries. There are numerous science and technology working groups that focus on specific countries, and scientific research and collaborations have led to new opportunities for U.S. engagement with foreign nations.

Although DOS is not a science and technology agency, it is becoming increasingly science literate. Every regional bureau now has a science advisor, and DOS has expanded the number of AAAS and Jefferson Fellows it supports. However, DOS depends on other agencies, such as NSF, NIH, NIST, DOE, EPA, and NOAA for scientific advice, and convenes meetings of these agencies to develop U.S. positions on specific topical areas. The various science agencies bring different perspectives to discussions. She observed that Foreign Service officers are very different from scientists – scientists have deep expertise in a few topics, whereas the Foreign Service culture emphasizes broad perspectives and the ability to “land and run.”

Several AC-ISE members commented on the importance of water resources in foreign policy. Scientific data about the location and flow of water across international boundaries are politically sensitive, and building trust between nations is essential. Dr. Jones stated that most water-treaties focus on the oceans, but there is a critical need to address regional and river issues.

Access to electricity (energy poverty) and questions about the source of electricity were highlighted as important elements of science diplomacy. Members also raised the important linkage between research and education, and the role of women in implementing practical science in local communities.

Dr. Jones stressed that each nation’s culture must be respected and that policy and programmatic initiatives need to adapt to foreign situations. For example, the U.S. model for engaging industries to work with local universities may not be appropriate in developing countries.

Dr. Weber noted that there are about 48 science and technology agreements, but that few are active and fewer still have funding. He suggested that the Embassy Fellows program, which

supports U.S. experts on short details to U.S. embassies, could be expanded. Dr. Jones replied that a real challenge is the cost of these initiatives, and that other models for addressing science needs at U.S. embassies should be considered.

Dr. Jones concluded by noting that although science and technology are key pieces of U.S. relationships with foreign countries, it remains difficult for U.S. agencies to fund international scientists. Some countries don't need the assistance, but others do. The MOU between NSF and USAID could have a major impact on this issue. The U.S. scientific community recognizes that international collaborations are essential, and politically, Congress is becoming more receptive to international science collaboration and funding.

#### Invited Presentation by Alan Blatecky, Acting Director, NSF Office of Cyberinfrastructure

Dr. **Alan Blatecky** noted that the world of science is rapidly changing as a result of improvements in technology and opportunities in cyberinfrastructure. He made several observations: science and scholarship are both team sports that require effective use of available resources; collaborations and partnerships will change significantly over time; ownership of data and interoperability are becoming vitally important; innovation and discovery will be driven by analysis; mobility and personal control will drive innovation; and social networks will transform science, research, and education.

In response to comments about the proper balance between intellectual property, data-sharing, and privacy, Dr. Weber noted that NSF now requires data management plans in all proposals. The emerging role of cyberlearning and social media in education systems was contrasted with a stark observation that some communities do not have pencils.

Dr. Blatecky posed some major questions for the AC-ISE to consider: what data requirements will international science need to address in the next 5 to 10 years; what large-scale scientific facilities and instruments are planned and will need to be connected; how can cyberinfrastructure be leveraged to support science in developing countries; what types of cyberinfrastructure are needed; and how can we enable and support research networks?

#### Panel of Non-U.S. AC-ISE Members

Dr. Rahman invited the four non-U.S. AC-ISE members to offer their perspectives on how other nations address S&E issues.

Dr. **Howard Alper**, Chair, Science, Technology, and Innovation Council of Canada, ([www.stic-csti.ca](http://www.stic-csti.ca)) described six examples of how Canada facilitates international collaborations and innovation.

- *Vanier Canada Graduate Scholarships Program* – Three-year scholarships for Canadian and international doctoral students.
- *Banting Postdoctoral Fellowship Program* – Two-year awards for early career Canadian and international researchers.
- *Canada Global Excellence Research Chairs* – Up to seven-year awards for research chairs to establish programs in Canada's S&T priority areas.

- *African Institute for Mathematical Sciences* – Funding for five new S&T schools in Africa to recruit and train students and teachers, and to build capacity for African initiatives.
- *Grand Challenges Canada* – A not-for-profit organization to deliver Canadian Development Innovation Funds to researchers and organizations, and to support implementation and commercialization of solutions that emerge.
- *International Development Research Centre* – Created in 1970 by the government of Canada and recently leveraged with Microsoft to build research capacity in developing countries.

Dr. **Jean-Pierre Ezin**, African Union Commissioner for Human Resources, Science and Technology, African Union Headquarters, Addis Ababa, Ethiopia, gave examples of partnerships recently forged by the African Union (AU). Since 2006, the AU has worked with the European Union to put in place a joint strategic plan, resulting in 8 partnerships and EU funding of \$78 million worth of research in Africa.

AU is developing cooperation with India. An action plan has led to India funding a pan-African program in health and education, and establishment of 5 regional educational centers involving 34 countries. Plans are also underway for a pan-African university with five regions focusing on different topics. Each region will be paired with a non-African country for support, for example an Institute for Life Sciences between Nigeria and India. AU is seeking input from the USAID and NSF for help with a decentralized administration and governance.

Dr. **Roddam Narasimha**, Chairman, Engineering Mechanics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bangalore, India, reported that management of S&T in India is changing. Until recently S&T was managed by the Science Department, which had research responsibility. A National Science and Engineering Research Board (NSERB) has been established, roughly as NSF's counterpart, with the chairman of the NSERB also serving as the Secretary for the Science Department. The NSERB will be more active with international collaborations and joint research, and Dr. Narasimha noted an opportunity for NSF engagement. He identified two challenges for collaboration – technology control and visas. India is also undertaking a vast expansion of research and academic centers. A change in policy may soon enable Indian institutions to establish presence outside of India.

Dr. **Ismail Serageldin**, Director, Library of Alexandria, Alexandria, Egypt, stressed the importance of investing in capacity-building in developing nations in order to achieve effective collaboration. Dr. Serageldin commented on the difficulty of evaluating collaborations and the need to clarify the meaning of “success.” He noted that the loss of talented students and researchers (“brain-drain”) can cause significant problems for a country's capacity and development. Incentives are needed to re-attract or to sustain links with these scientists. Mechanisms are needed for long-term tracking and maintaining contact among international collaborators.

Dr. Rahman adjourned the September 20 AC-ISE meeting at 5:25 p.m.

## TUESDAY, SEPTEMBER 21, 2010

Dr. Rahman called the AC-ISE meeting to order at 8:30 a.m.

### Discussion with NSF International Coordinating Committee

Dr. Suskin explained that the International Coordinating Committee (ICC) was established in 2003 by the NSF Director to discuss and exchange information on international issues. The ICC is comprised of representatives from each of the NSF Directorates/Offices and meets periodically or when a specific need arises within NSF. OISE chairs the ICC. The ICC was actively involved in formulating the “NSF Policies and Practices for International Engagements” document. Dr. Suskin introduced the ICC panel and stated the purpose of their meeting with the AC-ISE is to bring together internal and external NSF advisory bodies to understand and discuss their respective perspectives.

Six of the 12 NSF ICC members participated in the panel. Each described illustrative international activities in their disciplinary areas.

Dr. **Judith Sunley** (SBE – Social, Behavioral, and Economic Sciences) stated that SBE supports several topical areas that have large international components, such as the study of endangered languages, political science, and cultural anthropology. Most of this work is done on an investigator to investigator basis, without the need for time-consuming MOUs. She listed several other SBE activities that might be of interest to AC-ISE:

- The biennial Science and Engineering Indicators Report, produced by the SBE Division of Science Resources Statistics with oversight from the National Science Board, provides major high-quality quantitative data on the U.S. and international science and engineering enterprise (<http://www.nsf.gov/statistics/seind10/>).
- The Science of Science & Innovation Policy Program develops tools to help policy makers better understand science and data analysis ([http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=501084](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501084)).
- STAR METRICS (an acronym for Science and Technology in America’s Reinvestment – Measuring the Effect of Research on Innovation, Competitiveness and Science) is an interagency working group that uses administrative data from federal agencies to begin to assess the impacts of federal funding ([http://nrc59.nas.edu/star\\_info2.cfm](http://nrc59.nas.edu/star_info2.cfm))

Dr. **Michael Reischman** (ENG - Engineering) expressed the Engineering Directorate’s support for OISE’s PIRE program. He briefly summarized the process of developing a nanotechnology partnership between NSF and counterparts in Ireland and Northern Ireland, noting that NSF struggled to agree on a Memorandum of Understanding, define PI roles on specific research issues, and establish a process for reviewing and funding collaborative proposals. He also described an international collaboration involving conferences in developing countries and the U.S. to promote international collaboration among women.

Ms. **Joanna Rom** (BFA – Budget Finance and Award Management) deals with solicitations and terms and conditions of awards with international components. NSF program officers and PIs must understand that they have to comply with both NSF guidelines and rules in other countries.

She emphasized the importance of standards for the responsible conduct of research in international collaborations. BFA hosts numerous visitors from other countries to exchange lessons in auditing, grants management, and budgeting.

**Dr. Morris Aizenman** (MPS – Mathematics and Physical Sciences), reported that MPS is pursuing the notion of “science without borders,” focused on experimental and observational capacity beyond the means of any single country. The costs of gigantic facilities (such as large telescopes) are too great, even for large superpowers, and partnerships are essential. Challenges arise in financial allocation, long-term financial sustainability, appropriate matching of abilities, proposal review procedures, and defining rules of equipment usage. Agreements with other countries on how to review and support joint proposals are always complicated.

**Dr. Suzanne Iacono** (CISE – Computer and Information Science and Engineering), characterized collaborative activities that range and evolve through different levels of commitment from casual/short-term, such as early planning visits or pilot projects, to serious/long-term. She stated that long-term collaborations should address areas where the U.S. truly needs something from another partner. For example, a MOU with Germany emerged from a U.S. community desire to work with German mathematician counterparts on computational neuroscience. She also mentioned a federation of research networks that facilitates access to network resources for U.S. and European researchers.

**Dr. Simon Stephenson** (OPP – Office of Polar Programs) pointed out that Arctic research is often international and at least half of it occurs outside of the U.S. The U.S. Arctic program often tries to gain access to foreign sites (especially with Russia), and has more success than failure despite the lack of a specific NSF-Russia agreement. The U.S. has an agreement with Denmark/Greenland to study ice sheets, and ecosystem and social issues, with an emphasis on ensuring that research and results are accessible to the indigenous population. Many research collaborations happen on an individual researcher basis rather than through MOUs.

Dr. Rahman asked the panel how they proactively encourage younger scientists to collaborate internationally. Panelists responded: ENG has a program focused on women in engineering; MPS has specific programs for younger scientists, and they place scientists in European labs; CISE has programs that focus on undergraduates, with summer programs on robotics in Japan and Korea; the International Polar Year had a young scientist program; NSF-wide postdoctoral fellows are encouraged to get involved in international collaborations.

Dr. Serageldin raised the issue of intellectual property rights and open access to data in international partnerships. Dr. Sunley mentioned ongoing efforts to make social science datasets more publicly available and pointed to a project that is collecting and distributing census data from around the world (<https://international.ipums.org/international/>). Dr. Iacono stated that there are no significant intellectual property rights issues when collaboration is on a researcher to researcher basis, but when industry gets involved, it can get very problematic. Ms. Rom noted that a data management plan is required for every NSF research proposal. She referred the Committee to the NSF Office of the General Council for information about patents, copyrights, and accessible data sets and archives.

Dr. Weber stated that bilateral S&T agreements are maintained by the Department of State, and that they usually address intellectual property rights issues. Such issues are not specific to NSF, thus a broader governmental discussion may be needed.

#### Conversation with Cora Marrett, Acting Director, NSF

Dr. Rahman welcomed Dr. **Cora Marrett** to the AC-ISE meeting. Dr. Marrett thanked the AC-ISE for working with NSF and OISE, and remarked on the value of expanded international representation on the Committee. Dr. Marrett affirmed that an international vision is essential to the future of NSF, and the U.S. and that Dr. Subra Suresh, NSF Director, pending Senate confirmation, is very interested in international issues.

Dr. Rahman asked how the four OISE cross-cutting issues that were considered by AC-ISE at this meeting (Muslim-majority countries, science diplomacy, cyber-infrastructure, and diversity and broadening participation) are woven into NSF operations and how PIs should orient proposals to address them. Dr. Marrett urged PIs to look for linkages between the issues. For example, strengthening cyberinfrastructure in developing countries could have positive impacts on broadening participation. She emphasized that top-quality science is essential for effective science diplomacy.

Dr. Weber asked how NSF could work effectively with other Federal agencies on international issues. Dr. Marrett suggested that it would be good for OSTP to serve as a coordinating body. She applauded OISE for making connections within NSF and across other agencies. The ICC is a fine example of OISE leadership within NSF. She warned that NSF must be careful about placing too many expectations on NSF staff. The AC-ISE needs to be actively involved in identifying priority areas and shaping NSF and OISE initiatives. She urged the AC-ISE to keep focused on long-term goals and maintain momentum by continuing interactions between meetings.

#### Discussion of NSF Crosscutting Issues and Planning for next AC-ISE Meeting

Dr. Webber suggested two dates in April for the next AC-ISE meeting and will poll members for availability. He recommended that a three-day meeting of an OISE Committee of Visitors be convened as an AC-ISE subcommittee, and noted that an early June COV meeting is being considered. An AC-ISE member must serve on the COV and volunteers should contact Dr. Webber.

Dr. Rahman reiterated Dr. Marrett's remarks about maintaining momentum and strongly urged each Working Group to hold teleconferences before the spring 2011 meeting to make progress on their charge. He asked that the minutes of the September meeting be circulated to members for feedback.

Dr. Rahman adjourned the Advisory Committee meeting at 11:45 a.m.

**National Science Foundation**  
**Advisory Committee for International Science and Engineering**  
**Membership List**  
*September 20-21, 2010*

**Saifur Rahman - Chair AC-ISE**, Director, Virginia Tech Advanced Research Institute, Arlington, VA.

**Howard Alper**, Chair / Président, Science, Technology and Innovation Council / Conseil des sciences, de la technologie et de l'innovation, Ottawa, Ontario, Canada.

**Jean-Pierre Ezin**, African Union Commissioner for Human Resources, Science and Technology, African Union Headquarters, Addis Ababa, Ethiopia.

**Lueny Morell**, Director of University Relations, Hewlett Packard Company, Palo Alto, CA.

**Roddam Narasimha**, Chairman, Engineering Mechanics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bangalore, India.

**Jeanne L. Narum**, Founding Director—Project Kaleidoscope (PKAL), Senior Fellow—PKAL/Association of American Colleges & Universities, Director—The Independent Colleges Office, Washington, DC.

**Maresi Nerad**, Director, Center for Innovation and Research in Graduate Education (CIRGE), Associate Dean, UW Graduate School, Associate Professor, Educational Leadership and Policy Studies College of Education, University of Washington, Seattle, WA.

**Barbara Olds**, Professor Emeritus, Division of Liberal Arts and International Studies, Colorado School of Mines, Golden, CO.

**Kevin Pilz**, Commodity Security and Logistics Adviser, Commodities Security and Logistics Division, Office of Population and Reproductive Health, Bureau of Global Health, U.S. Agency for International Development, Washington DC.

**Ismail Serageldin**, Director, Library of Alexandria, Alexandria, Egypt.

**Nicholas Vonortas**, Director, Center for International Science and Technology Policy, George Washington University, Washington, DC.

**Janis C. Weeks**, Professor, Institute of Neuroscience, University of Oregon, Eugene, OR.

**Daniel Wubah**, Vice President and Dean for Undergraduate Education, Office of the Provost, Virginia Tech, Blacksburg, VA.

**Lilian Wu**, Program Executive, University Relations, Corporate Technical Strategy Development, IBM Corporation, Yorktown Heights, NY.

**George Middendorf - CEOSE Liaison**, Professor of Biology, Howard University, Washington, DC.

**INTERNATIONAL PROGRAMS**  
**WORKING GROUP**  
**September 2010**

Charge:

The National Science Foundation (NSF) is committed to implementing effective programs to facilitate international partnerships, collaborations, and educational experiences in the national interest. The NSF Office of International Science and Engineering (OISE) serves as a focal point for international science and engineering activities both inside and outside NSF. OISE promotes the development of an integrated, Foundation-wide international strategy, and manages international programs that are innovative, catalytic, and responsive to a broad range of NSF and national interests. The Office carries out its functions through close partnership with other federal and international agencies, the NSF Directorates, and through its own program activities.

The Programs Working Group will provide guidance and suggestions regarding the balance, scope, and impact of NSF's broad portfolio of international programs. Initial consideration will focus on OISE-managed programs, but then be expanded to include all of NSF. The NSF portfolio of international initiatives includes: (a) explicitly international programs managed by OISE, (b) international funding opportunities with disciplinary foci supported by other NSF units, (c) career development and research programs that do not require but do encourage and enable international collaborations, and (d) any NSF program that can support international activity as part of its regular research and education grants.

Membership:

Jeanne Narum, Chair  
Roddam Narasimha  
Maresi Nerad  
Lilian Wu

Elizabeth Lyons, OISE Liaison

**DEVELOPING COUNTRIES**  
**WORKING GROUP**  
**September 2010**

Charge:

The developing world contains a wealth of human knowledge, natural resources, and field sites which will continue to be of great interest to the U.S. scientific community. Building functional partnerships with scientists in developing countries can require additional foresight and creativity as there are often cultural and resource barriers to overcome.

The Developing Countries Working Group will advise the NSF on how it might facilitate the efforts of U.S. scientists to interact and partner more effectively with their developing country counterparts. Such advice might entail: (a) defining future priority research areas in which the developing world will play a major role, (b) building new partnerships that will help NSF enable research cooperation with developing country scientists, and (c) creating new mechanisms by which NSF can leverage its investment in U.S. science to enhance U.S. partnerships with developing countries.

Membership:

Daniel Wubah, Chair  
Jean-Pierre Ezin  
Kevin Pilz  
Ismail Serageldin  
Janis Weeks

DeAndra Beck, OISE Liaison

**STRATEGIC PLANNING**  
**WORKING GROUP**  
**September 2010**

Charge:

Strategic Planning is essential to effectively communicate organizational direction and coordinate efforts and activities. The National Science Foundation is updating its 2006-2011 Strategic Plan in accordance with Federal guidelines, including expanded emphasis on international issues.

The Strategic Planning Working Group will work with the Office of International Science and Engineering (OISE) to align the OISE Strategic Plan to be congruent with the updated NSF Strategic Plan. More generally, the Working group will advise the National Science Foundation on broad strategic issues affecting research and education in the international context, including for example, STEM workforce development and mobility, the globalization of higher education, large facilities, cyberinfrastructure, and open access to data.

Membership:

Lueny Morell, Chair  
Howard Alper  
Barbara Olds  
Saifur Rahman  
Nicholas Vonortas

John Tsapogas, OISE Liaison