

Advisory Committee Meeting Minutes
ADVISORY COMMITTEE FOR INTERNATIONAL SCIENCE AND ENGINEERING
July 28-29, 2016
NATIONAL SCIENCE FOUNDATION
Stafford II - Room 1155 Conference Room

AC-ISE Members in Attendance:

Susan Avery, Jay Cohen* (July 28), José Fortes, Julio Ibarra, Anne Petersen, Winston Soboyejo

AC-ISE Members Not in Attendance:

Margaret Lowman, Steven McLaughlin, Monica Olvera de la Cruz

Thursday, July 28

Welcome – Susan Avery, AC-ISE Chair

Dr. Susan Avery opened the meeting by welcoming everyone, asking for introductions of the committee members, NSF OISE staff, and guests. The summary minutes from the January 2016 meeting were approved.

OISE Overview and Update – Rebecca Keiser, OISE Office Head

Dr. Rebecca Keiser thanked the committee and asked for their help in implementing the international strategy that was presented at prior meetings. Dr. Keiser reviewed the overall strategy to advance science through international collaboration and provided updates on three categories of activities:

International engagement guidance. Working with the re-instated International Coordination Committee, OISE is addressing the ICC's request to update the 2010 document, "*NSF Policies and Practices for International Engagement.*" A committee comprised of OISE staff and individuals from the NSF policy office and Office of General Council is undertaking the document update, which will include a new section with guidance on how to handle proposals from overseas branches of US campuses. Dr. Keiser asked for future input by the AC on the document.

Transparency and Accountability. Dr. Keiser reported on three activities that increase OISE's transparency and accountability: (1) the program analysis conducted by the new cluster, (2) a series of customized reports that are in development by AAAS Fellow Mike Rook, and (3) a formal strategic plan for OISE. Dr. Keiser would like to bring the strategic plan that is underdevelopment to the AC for input.

Interface with State and interagency community. Dr. Keiser described the strategy to increase engagement between NSF and the State Department, the increased participation in the National Science and Technology Council's International Subcommittee, and increased interaction with other US government agencies through the Air Force Office of Scientific Research-hosted Multi-agency International S&T Engagement Collaboration (MISTEC).

The AC discussed whether the strategic plan underdevelopment was an internal document, who would provide input, and how it related to other strategic plans. The importance of stakeholder ownership in the strategic plan was noted. The committee discussed the constituency for international science and engineering and agreed on the importance of being intentional in the international relationships and messaging the many dimensions on international activities with care.

Dr. Keiser then discussed the re-organization of OISE, reviewing that a few years ago a staff of 57 people were grouped into regions. The new arrangement of three clusters (Administrative, Countries and Regions, Programs and Analysis) accommodates the current smaller staff size and the need to increase the focus on analysis. Dr. Keiser described the matrix approach for projects involving staff across the clusters and identified six new staff members (Deputy Office Head, Supervisory Budget Analyst, two program officers each in the Cluster and Regions and Programs and Analysis clusters).

The AC discussed the changes in perspectives, placement, and staffing of international science and engineering in the Foundation over time. The transition to bring up OISE morale and staff numbers, using permanent or Fed Temp positions rather than rotators, was commended.

Lara Campbell reported on the Innovations at the Nexus of food, Energy, and Water Systems (INFEWS), in which the OISE budget of \$1.2 M leveraged projects totaling \$9 M in the FY16 cycle. The next INFEWS solicitation will include Department of Energy as a partner.

The committee discussed international and scientific concerns associated with GMOs, gene editing, aquaculture. Interdisciplinarity was discussed, along with concerns that the directorate structure and solicitations impede interdisciplinary science innovations. The committee agreed on the importance of engaging the global community for globally informed and acceptable strategies to grand challenges. Building up the global knowledge base and building network of trust are essential. There is potential to provide nuggets of data to the OISE constituencies for them to relay to the broader community.

Overview of Matrixed Projects Led by New Clusters – Jackie Moore, Lara Campbell, Anne Emig

Prior to the presentations, Dr. Avery asked the AC to consider how the cluster reports might inform next steps on the topics that the AC previously identified as of interest for subcommittees.

Jackie Moore provided an overview on activities of the Administration Cluster, emphasizing the development of standard operating procedures and a new onboarding document as current projects.

Lara Campbell discussed activities of the Country and Regions Cluster, emphasizing the stepped-up outreach to foreign embassies in DC and US embassies abroad and the matrix project to update Country papers. These Country papers are intended to provide individuals traveling abroad with an overview of the S&T landscape and NSF investments. Dr. Campbell also discussed the roles of facilitation, representation, and reporting of the OISE overseas offices and asked the AC to consider what additional roles these offices could serve and models of operation to ensure a robust regional presence. Dr. Campbell asked for AC input on approaches the cluster could use to organize its efforts.

The AC discussed the mechanisms OISE uses to share what is happening and the importance of formalizing mechanisms and putting infrastructure in place, whether just an online repository or more elaborate. Dr. Keiser commented that the Programs and Analysis Cluster could take on a project to formalize mechanisms for communication across the directorates.

Bearing in mind the role overseas offices play to build and maintain relationships, the committee discussed the relative merits of a single office location, hoteling (3 mo in Singapore, 3 mo in Korea, etc.), and co-location arrangements with other government offices. The use of short-term assignments was discussed, but raised concern that they were too short to build relationships. The committee discussed the challenges of covering emerging areas with limited overseas presence and the geopolitical issues that would be associated with closing or reshaping overseas offices.

Anne Emig reviewed the recommendations the Programs and Analysis cluster to sunset several small co-funding opportunities and redirect funds to more strategic funding opportunities. The proposed OISE funding portfolio includes:

- A new program, tentatively named International Virtual Institutes (IVI), to support network-to-network science
- The existing Partnerships for International Research and Education (PIRE) program, to support international team science in frontier research
- An enhanced International Research Experiences for Students (IRES) to support student cohorts and global workforce preparedness
- An OISE strategic action fund to catalyze international research

Dr. Emig discussed the potential to link the network-to-network funding opportunity to the NSF big ideas and presented a timeline to implement the proposed portfolio.

The AC was enthusiastic about the strategically realigned portfolio. The committee discussed the ~\$50 M OISE budget, the process that led to these recommendations, funding opportunities for student travel funds, program management issues, and potential risk of missing some entry points for individual researchers by eliminating some OISE funding mechanisms.

The committee discussed the importance of preparing the research community for the new funding opportunity prior to releasing a solicitation or DCL. Discretionary funds could be used to bring US and US and foreign researchers together to build collaborations that involve more than the usual suspects. One committee member also encouraged that collaborations be built to maintain some roots in a country and then reach out to emerging areas in a graded approach.

The committee discussed the need for long term analysis and asked what processes could be put in place to gather the data and measure the impacts. One committee member asked about an earlier effort to capture the successful international infrastructure and international research programs. Chair Susan Avery recommended that OISE take on a review looking across NSF and also find and share the prior work. OISE staff members thought this was done in 2012 by an AAAS fellow. Dr. Keiser noted that different models of international collaborations could be included in such a review.

Working lunch – impromptu request for ADs to join

Dr. Roger Wakimoto, Assistant Director of the Directorate for Geosciences, described the GEO approach to coming up with the big ideas and aspects of the “Navigating the New Arctic”.

Committee and Subcommittee Planning – Rebecca Keiser, Susan Avery

Dr. Avery asked the AC if they wanted to mull over cluster presentations and discuss further Friday. The AC agreed they preferred to discuss subcommittee planning on Friday.

International Strategy for NSF Big Ideas for Future Investment – Rebecca Keiser

Dr. Keiser summarized the six research ideas and four process ideas that comprise the big ideas.

- Harnessing Data for the 21st Century Science and Engineering
- Shaping the new Human-Technology Frontier
- Understanding the Rules of Life
- The Quantum Leap: Leading the Next Quantum Revolution
- Navigating the New Arctic
- Windows on the Universe: The Era of Multi-messenger Astrophysics
- Growing Convergent Research at NSF
- Mid-scale Research Infrastructure
- NSF 2050
- INCLUDES

The AC discussed which of the big ideas lend themselves well to international collaboration and those in international activity particularly important.

Preparation for Meeting with Dr. Buckius – Susan Avery, AC-ISE Chair

Dr. Avery noted that the Director was not able to meet with the AC because she was in Namibia. The AC identified topics for its discussion with Dr. Buckius.

Meeting with Dr. Richard Buckius, NSF Chief Operating Officer

Dr. Avery welcomed Dr. Buckius and asked for his thoughts about the administration transition and the international needs and requirements for the big ideas. Dr. Avery began with a summary of the AC agenda and reported the AC’s positive response to the OISE reorganization, staffing, and planning.

Dr. Buckius thanked the AC and provided an update on planning for transition, expectations for House and Senate budget markups, and the Director’s continued work to ensure that directorate level funding was not specified by Congress.

Dr. Petersen thanked Dr. Buckius and Dr. Córdova for their hard work despite challenges. Dr. Petersen voiced the committee’s enthusiasm for the proposed strategic realignment of OISE funding portfolio.

Dr. Ibarra relayed the positive view of the new OISE positions as staff not IPA positions given the importance of continuity in the work OISE does and asked about responsibilities with budget and staff

constraints. Dr. Fortes reported on the committee's discussion about sharing success cases of international collaboration. Admiral Cohen offered his perspective on packaging and messaging, particularly for the Hill. Dr. Soboyejo commented on the committee's interest in the big ideas and the potential for new collaborations and broadening participation within the big ideas.

NSF Engagement with Africa - Nkem Khumbah

Dr. Nkem Khumbah, University of Michigan STEM-Africa Initiative, presented a framework for science engagement in Africa. Dr. Khumbah provided an overview of demographic projections, recent trends of interest in Africa by foreign countries, and the regional approach Africa is taking toward development and higher education. Dr. Khumbah emphasized that strategic engagement in Africa should consider regional and/or continental approaches, which include the regional centers of excellence, such as the Nelson Mandela Institutes, the African Union's Pan African University Institutes, and others.

Dr. Khumbah presented example options on how to engage:

1. Low hanging fruit using the list of usual mechanisms supplements, DCLs, solicitations; Network to network science mathematical science institutes and ACE Mathematics Centers; Embassy Fellows at African Union and regional policy bodies.
2. Africa specific programs akin to PASI or EAPSI inspired Advanced Study Institutes; MOU with USAID to support science focused higher education like program PEER-like or Education and Workforce Development; Partner with ACE (World Bank) to catalyze US-Africa Science Communities; set up an Office in Africa.

Dr. Khumbah discussed the potential to host workshops for active researchers who have been funded by NSF to provide feedback to NSF on ways to scale up or deepen collaborations in Africa. An option is to coordinate a workshop with the STEM-Africa conference in May 2017 in Cameroon.

The committee expressed appreciation for the thoughtful presentation and the tremendous impact a decade of US-Africa collaboration could have. The discussion covered several topics, including where and NSF office in Africa might best be located and laboratories in Kenya doing world class work. The committee requested a list of the emerging centers of excellence and world-class laboratories in Africa to illuminate further discussions.

The Chair provided a preview for Friday and adjourned the meeting for the day.

Friday, July 29

Measuring the Impact of International Experiences - Brian Mitchell

Dr. Susan Avery welcomed the group for the second morning, reconvening the meeting by 9 am. Dr. Keiser introduced Dr. Brian Mitchell, Council of Graduate School's Dean-in-Residence to NSF.

Dr. Mitchell described an NSF-funded workshop co-organized by the German Research Fund that focused on measuring the impact of experiences of international research for graduate students. Dr. Mitchell summarized the key findings available in an online report:

- We don't know very much on assessment of international experiences.
- We need foundational research on the value of international experiences, their impact on global competencies, the effects of timing and duration of the experiences and the barriers to participation by under-represented groups.
- Participation increases likelihood of continuing international collaborations (found in PIRE evaluation).
- There is a potential link between networking opportunities and later career success.

Dr. Mitchell presented the recommendations from the workshop on what federal agencies and organizations, institutions, principal investigators, and graduate students could do to improve the assessment of international student engagement and dissemination of effective practices.

Discussion following the presentation addressed discipline specific issues, assessment instruments to evaluate the impact of international experiences, cohort versus individual experiences, geographic trends in student locations, the role of scientific societies in student research experiences, the timing of international experiences during student careers, and student empowerment. Dr. Avery thanked Dr. Mitchell and lamented that the Dean-in-Residence program has ended.

Group Discussion – Susan Avery, AC-ISE Chair

Topics for Subcommittees. Dr. Avery initiated the discussion about subcommittees by asking if Portfolio Balance, Topics for Studies/Foresight Analysis, Community Outreach/Workshops, and Engaging the Diaspora were the correct four topics. The committee and OISE discussed what was being asked of the committee, what timescales the committee should be considering for looking ahead, and where to focus attention. It was decided that Topics for Studies/Foresight Analysis is the core area and that conference calls should be used to develop a pathway forward on this.

Prioritizing the Big Ideas. Dr. Avery asked the committee to prioritize the six big ideas. The synthesized priority order was: 1. New Arctic, 2. Harnessing Data, 3. Rules of Life, 4. Human-Technology, 5. Windows on the Universe, 6. Quantum Leap. The committee discussed the close relevance between Harnessing Data and Human-Technology Frontiers. In both of these, OISE could help shape the ideas, international standards will be important, and international collaboration need to be created. Navigating the New Arctic, Rules of Life, Quantum Leap and Windows on the Universe will involve established collaborations in many cases. Midscale infrastructure is a priority for international collaboration.

Next Steps. Use this priority order of the big ideas as place to jumpstart the teleconference and identify the questions relevant to developing an international strategy around the big ideas.

Meeting Dates. It was decided to explore future meeting dates in the fall and spring. Tentative next date Nov 28-29, 2016. To confirm the November dates, Claire Hemingway will send out a Doodle poll.

Adjournment. The chair adjourned the meeting approximately 12:35 pm.