



**Advisory Committee for International Science and Engineering (AC-ISE)
Office of International Science and Engineering (OISE)
National Science Foundation**

**2019 December Virtual Meeting
December 13, 2019**

Meeting Minutes

MEETING PARTICIPANTS

AC-ISE Members Present

Dr. Susan Avery, Chair, Woods Hole Oceanographic Institution
Dr. Jay M. Cohen, The Chertoff Group
Dr. Mary (Missy) Cummings, Duke University
Dr. José A.B. Fortes, University of Florida
Dr. Martha Haynes, Cornell University
Dr. Shafiqul (Shafik) Islam, Tufts University
Dr. Keith Marzullo, University of Maryland
Dr. Anne Petersen, University of Michigan
Dr. Caroline Wagner, The Ohio State University
Dr. Nai-Chang Yeh, California Institute of Technology

Speakers/Presenters

Rebecca L Keiser, Office Head, OISE
Samuel Howerton, Deputy Office Head, OISE
Jessica Robin, Cluster Lead, OISE
Anne Emig, Cluster Lead, OISE
Dominique Dagenais, Program Director, ENG
Amanda Greenwell, Office Head, OLPA
Claire Hemingway, Program Director, OISE
Keith Chanon, Program Director, OISE
Arthur Lupia, Assistant Director, SBE

AC-ISE Administrative and Technical Team

Victoria Fung, Program Analyst, OISE
Kirk Grabowski, IT Specialist, OISE

Call to Order, Introductions and Opening Remarks

Dr. Susan Avery, Chair of the National Science Foundation Advisory Committee for International Science and Engineering (AC-ISE) called the meeting to order and invited the AC-ISE Members and presenters to introduce themselves. The members approved the minutes of the June 18-19, 2019 AC-ISE meeting.

Remarks/Updates

Dr. Rebecca Keiser, Head of the Office of International Science and Engineering (OISE) for the NSF Office of the Director, welcomed participants and provided summary remarks about the meeting's agenda and the topics to be covered during the AC-ISE meeting. Dr. Keiser introduced the new staff member, Mr. Chris Street, Staff Associate for Budget, and spoke briefly of the upcoming positions for a MULTIPLIER Project Coordinator and additional Project Officers.

Dr. Keiser reported on the international travel and engagements of the NSF Director, Dr. France Córdova. In October, the Director gave a keynote address at the Arctic Circle Assembly and met with Icelandic President Jóhannesson. She also travelled to Chile and met with President Piñera and various members of his Cabinet. While in Chile, the Director co-hosted the Global Research Council meeting in Santiago, and together with the Department of Energy Under Secretary for Science Paul Dabbar, visited the Large Synoptic Survey Telescope and the European Southern Observatory. In November, the Director delivered a keynote speech on ethics to the World Science Forum in Hungary. Additionally, Dr. Keiser reported on the Director's meetings with the Taiwan Ministry of Science and technology, the new German Ambassador Haber, and the Australian Ministry of Industry, Science, and Technology. Dr. Keiser then informed the Committee of some transitions occurring at other major international funding agencies.

Countries & Regions

Dr. Jessica Robin, Cluster Lead, OISE, provided an update on the Countries and Regions Cluster. Dr. Robin informed the Committee of the departure of Dr. Lara Campbell who transitioned to the Office of Integrative Activities and gave an overview of the multiple roles played by the Cluster.

Among the international highlights were meetings with the Chief Science Advisor to New Zealand's Prime Minister, the Minister of Science from Australia, the co-hosting of the Global Research Council's Americas Regional Meeting in Chile, hosting visits of the President of Canada's Natural Sciences and Engineering Research Council, the President of the Czech Academy of Sciences, the Irish Secretary General of Business, Enterprise and Innovation, and participating on the U.S. Government Delegation to a Germany-U.S. Joint Committee Meeting. Dr. Robin also mentioned office contributions to the collaboration with France on a long-duration balloon flight campaign and an OECD Global Science Forum on Effective Policies to Foster Transformative or High-Risk Research.

Dr. Robin spoke about the renewal or modifications of Agreements and Dear Colleague Letters, including the Memorandum of Understanding between the NSF, Science Foundation Ireland, and the Department of the Economy of Northern Ireland; the Implementing Arrangement between the NSF and the European Research Council; and the Memorandum of Understanding between the NSF and the Deutsche Forschungsgemeinschaft. In addition, she mentioned the expansion of the Dear Colleague Letter with the U.S.-Israel Binational Science Foundation to include programs in Astronomy, Atmospheric and Geospace Sciences, and Mathematics.

Dr. Robin finished her presentation with a listing of the newest cohort of Embassy Science Fellows who will be serving between one and three months at our Embassies in Austria, Chile, the Czech Republic, Greenland, Hungary, Malaysia, and Romania.

Programs and Analysis

Ms. Anne Emig, Cluster Lead, OISE presented material on the Programs and Analysis Cluster.

Ms. Emig outlined the structure of the cluster highlighting its funding programs.

1. The *AccelNet* program aims to build strategic linkages between U.S. and international networks to leverage complimentary funding sources and ensure that the U.S. scientific workforce develops the skills to thrive with international teams that drive discovery. For the first round of funding in 2019, nine awards were made: four in the catalytic category and five in the full-scale category. The second round is underway with receipt and review of Letters of Interest.
2. The *International Research Experiences for Students (IRES)* program aims to develop a diverse globally-engaged science and engineering workforce by providing international research experiences. The program has three tracks: sites, advanced studies institutes, and one for new concepts in international graduate education. A preliminary draft report was prepared on an IRES evaluation indicating that 500-550 students are trained each year and that the publication yield is better than expected. OISE expects a final version in 2020.
3. The *Partnerships for International Research and Education (PIRE)* program remains paused and the office is considering a possible new solicitation in late FY2020 or early FY2021 in order to make awards in FY2022. The program was delayed due to budget and staffing pressures. Ms. Emig indicated that the Advisory Committee will receive more information on PIRE at its next meeting.
4. The *Global Venture Fund (GVF)* leverages OISE's very limited funds to partner with the technical Directorates by selecting projects and awarding internationally-focused supplements that strengthen strategic directions. Ms. Emig mentioned OISE's last year's work with the Division of Undergraduate Education's Advanced Technology Education Program to fund \$300,000-worth of international supplements to Community Colleges. In addition, OISE gave supplements for Post-doctoral staff and CAREER awardees to partner with European Research Council grantees.

The cluster is also focusing on the Learning Agenda and Evaluation under the 2018 Evidence Act. Ms. Emig outlined the partnership with the Office of Integrated Activities (OIA) on a \$2 million research contract on monitoring and evaluation activities.

Discussion and Questions from the AC-ISE

Dr. Avery asked what the office would do if its budget was doubled?

- Ms. Emig replied that more experimental programs could be funded as well as more targeted opportunities with the Directorates.
- Dr. Howerton added that OISE could increase its role in shaping the White House Office of Science, Technology and Policy (OSTP) priorities including *Industries of the Future* and its key components of artificial intelligence, quantum, and bio-economy.
- Dr. Robin added that cooperation with the Education and Human Resources Directorate on two-year institutions is a good example of the types of programs that might be expanded with additional funds.
- Dr. Keiser added that OISE would be able to support international components to directorate programs similar to the two-year college international experiences for students supplements.
- Dr. Cohen agreed with the focus on quantum and biology. He emphasized that in his experience testifying to Congress about international engagement, he always emphasized that “ideas come from all over the world” and that if we were not internationally engaged, we were vulnerable to “technical surprise.”

Dr. Wagner asked whether there was an assessment of the impact of the various international science organizations?

- Dr. Keiser responded that evaluation of international organizations was a main topic of discussion at the recent meeting of the Board of International Scientific Organizations (BISO).
- The AC-ISE agreed that the U.S. needs to remain actively engaged in these organizations to maintain leadership and that they have an important role in international data management.

Briefing on UK MULTIPLIER

Dominique Dagenais, Program Director, Engineering Directorate, represented the MULTIPLIER team that went to the UK and presented on the activity. The objectives of the UK Quantum MULTIPLIER were to: 1) increase understanding of the UK’s investment in quantum and share reciprocal information about NSF, and 2) explore specific areas of quantum research deemed promising for US-UK collaboration. This initiative was also designed to inform and support NSF’s Quantum Leap Big Idea and involved several directorates, including Engineering, Computer and Information Science and Engineering (CISE), Mathematical and Physical Sciences (MPS), as well as OISE and two external experts.

The team visited over ten institutions and observed high caliber research that focused on innovation, technology, and application. The UK has invested over 360 million pounds since

2013 and developed a unique approach to doctoral training and workforce development, including summer bootcamps. Following the trip, NSF is exploring additional mechanisms to facilitate international collaboration in quantum and will host a delegation from Innovate UK (part of the UK Research and Innovation) that will visit the U.S. in November 2020 to focus on quantum technologies.

Discussion and Questions from the AC-ISE

Discussion with the AC-ISE addressed questions about protecting sensitive information regarding quantum research, collaboration with other countries beyond the UK, and principles of openness and transparency.

- NSF staff assured the AC-ISE that the Foundation includes provisions to protect sensitive information and to also promote openness and transparency through its formal agreements with international partners.
- In addition to the UK, the Foundation conducted a MULTIPLIER mission to Japan on quantum in 2018 and is planning for a follow-up workshop in February 2020. NSF is also considering opportunities with the European Union and with Canada.
- The AC-ISE agreed that MULTIPLIERS are an effective mechanism for NSF to understand, in more depth, the expertise of other countries and provides opportunities to address workforce development needs through international partnerships.

MULTIPLIER Looking Forward

Dr. Robin provided an update on MULTIPLIERS. MULTIPLIERS allow NSF to expand its regional footprint and provide a deeper understanding of specific research areas. With the help of the Office of Legislative and Public Affairs' increased branding efforts, NSF has seen opportunities for cross directorate and international collaboration increase. Dr. Robin mentioned that smaller fact-finding trips (referred to as Exploratory MULTIPLIERS) will also be utilized to seek potential collaborations and OISE will implement standard reporting and tracking mechanisms. A MULTIPLIER program coordinator staff position was recently posted, and interviews will be taking place soon.

Dr. Robin described the traits that OISE seeks in selecting an Exploratory MULTIPLIER country. These include: a) countries with increasing or high economic growth in the form of research development investments, b) science and technology capabilities, c) patent applications, and d) internationally co-authored publications. She also highlighted some of the completed Exploratory MULTIPLIERS as well as upcoming Exploratory MULTIPLIER trips.

Completed Exploratory MULTIPLIERS

- Switzerland and France (December 2-6, 2019): Future of Work at the Human Technology Frontier
- Czech Republic (December 9-13, 2019): Artificial Intelligence and Nanotechnology

Planned Exploratory MULTIPLIERS for Fiscal Year 2020

- South Korea: Materials, Chemistry, and Nanotechnology

- South Africa: Astronomy, Biodiversity, Education Research
- Brazil: Public-Private Partnerships
- Canada: Artificial Intelligence
- New Zealand: Inclusion/Education, Coastlines and People (COPE), and Plastics
- Australia: Plastics, Artificial Intelligence and Research Ethics

Science and Security

Dr. Keiser reported on science and security, including the Report of the Senate Committee on Homeland Security and Governmental Affairs (HSGAC) and the NSF-commissioned study by the independent JASON group addressing the threat from foreign influence in research.

The HSGAC concluded that America's research enterprise was built on certain values of reciprocity, integrity, merit-based competition, and transparency. It is concerned that some countries seek to exploit America's openness, that China has supported talent recruitment programs, and that the federal government has not developed a coordinated response to mitigate the threat.

NSF commissioned the JASON group to assess:

- Whether the U.S. principles of scientific openness should be affirmed or modified?
- If there are areas of fundamental research that should be more controlled?
- What controls could be placed on particular types of information, and how?
- What good practices could be implemented by academic researchers and/or funding agencies to balance openness with the needs for national security?

The report emphasizes the value of, and need for, foreign scientific talent in the U.S. as well as access to fundamental research. It highlights the importance for scientists to disclose all professional relationships and for governments to investigate failures of disclosure. Procedures are also recommended that promote a common understanding between academia and U.S. government agencies to protect U.S. interests and train the research community in ethics and best practices.

Dr. Keiser indicated that NSF will focus on implementing the JASON recommendations and will continue to develop new tools and policies to promote research integrity across the science community. The AC-ISE commended NSF for commissioning the report and taking action to address the newly identified risks to research integrity.

NSF and International Branding

Amanda Greenwell, Office Head for the Office of Legislative and Public Affairs (OLPA), gave a general overview of OLPA's goals for 2020 and how the office operates. She emphasized that NSF prioritizes public outreach to highlight success stories through an ever-changing social media landscape. By utilizing tools such as hashtags and a streamlined branding campaign, OLPA has been able to increase public awareness of the types of projects that NSF funds. An example given was the Event Horizon Black Hole photograph which was the result of

international collaboration that generated thousands of new followers to the NSF social media pages. The office is prioritizing further collaboration with members of Congress to highlight local NSF projects, an NSF blog, and a “Brought to you by NSF” campaign.

Ms. Greenwell introduced Rob Moller, OLPA’s new Head of Governmental Affairs for the office. Mr. Moller reiterated Greenwell’s sentiment that OLPA is actively looking to partner with local government officials to better educate the public across the country.

Discussion and Questions from the AC-ISE

The AC-ISE expressed support for OLPA’s initiatives and goals for 2020. Discussion included ideas for facilitating communications between the public and experts, similar to how the Transportation Security Administration responds to public requests. The AC-ISE also recommended that OLPA translate the website into foreign languages. Greenwell indicated that the office is considering a Spanish version of the website.

AccelNet Status Update

Dr. Claire Hemingway, Program Director, OISE, provided an update on AccelNet. AccelNet is a new program filling a research gap by supporting international networks of networks. The vision and goals are to advance the research field in any NSF-funded area and to align the effort with a community identified grand scientific challenge or NSF Big Idea. AccelNet includes funding at both the catalytic level (up to three years and \$750,000) and the full-scale level (up to five years and \$2 million). It will be at least a five-year initiative. The initial Call for White Papers was published in 2017 followed by workshop awards in FY2018, and the solicitation in 2019. Nine projects were funded in FY2019 at \$11.5 million. The funding success rate was only five percent due to the high number of proposals and limited budget. NSF expects even more interest with the 2020 solicitation.

Discussion and Questions from the AC-ISE

Discussion focused on clarifying the definition of networks and the types of projects that NSF will fund. Hemingway emphasized that the program focuses on research and not on infrastructure. The program also encourages the principal investigators (PIs) to learn more about team science and to participate in evaluation efforts. With respect to the budget, OISE has been successful in soliciting additional funding support from the directorates, however, due to the high interest from the research community, OISE hopes to obtain increased funding support.

Collaboration with Africa

Keith Chanon, Program Director, OISE, described NSF’s activities in Africa and introduced questions for further discussion. He identified the lack of equivalent counterpart agencies as a primary challenge for NSF to partner with organizations in Africa. The majority of research collaborations are through informal PI-to-PI relationships. NSF has been a long-standing participant in the U.S. Agency for International Development’s (USAID) program on “Partnerships for Advanced Engagement in Research (PEER).

Discussion and Questions from the AC-ISE

Following the review and analysis of NSF-supported research in Africa, the AC-ISE discussed ideas for increasing NSF activities in the continent. The Committee recommended the establishment of a small working group on Africa to identify actions for OISE to consider. Some ideas included the importance of facilitating partnerships between universities in Africa and the U.S., working with the African Union and the World Bank, and contacting the Africa Grantmakers Affinity Group.

Meeting with NSF Chief Operating Officer Fleming Crim

Dr. Crim conveyed the greetings and regrets from the NSF Director who was returning from travel and could not attend the meeting. Crim reported on the Director's trips to Iceland, Chile, and Hungary. He also mentioned his attendance at the House of Sweden's U.S. Nobel Laureates reception and the Ambassador's luncheon and attended a luncheon at the Dutch embassy which featured a virtual reality version of being in orbit (spacebuzz.earth).

Dr. Crim described the plans for celebrating NSF's 70th anniversary in 2020 and reminded everyone that 2020 is also the 75th anniversary of Vannevar Bush's "Endless Frontier," the foundational text for NSF. He reported that the current budget Continuing Resolution ends December 21st and that he hopes that an agreement will be reached to fund NSF at a level of \$8.3 to \$8.6 billion.

Discussion and Questions from the AC-ISE

A discussion followed on the importance of OISE and international activities for NSF. Several members of the AC-ISE congratulated Dr. Keiser and NSF for transforming OISE and increasing its reach, globally, through the MULTIPLIER initiative and AccelNet program. Dr. Crim agreed and confirmed that the science directorates view OISE as a resource to assist with international collaborations and that NSF needs to support international collaborations through various mechanisms.

In addition to referencing the important issue of science and security and NSF's engagement on this issue, Dr. Crim expressed interest in the AC-ISE's interest for NSF to strengthen collaborations with Africa. He supported the idea of a small working group and suggested that it focus on a topic, such as sustainability, to help identify NSF's "value-added" in light of research activities supported by other countries and organizations. He also raised a question regarding South Africa and its ability to engage its neighbors and promote research within the continent.

SBE Directorate Reorganization

Dr. Arthur (Skip) Lupia, Assistant Director, Directorate for Social, Behavioral, and Economic Sciences (SBE), presented on SBE's reorganization. He began his presentation by describing the goals of the Directorate and the importance of the social sciences within society. He also focused on the importance for SBE to communicate the value of social and behavioral sciences to a wide range of stakeholders and to build new research partnerships. These partnerships

must extend beyond NSF throughout the government (domestic and international) and the public and private sectors to advance basic science and improve the quality of life for people. SBE's strategy is to rely on communications to go on the offense, reposition the portfolio, and to make the public value of basic research more apparent.

Discussion and Questions from the AC-ISE

The AC-ISE applauded Dr. Lupia for his leadership in transforming and rebranding SBE. Lupia referred to the importance of the [2017 National Academies Report](#) on the value of social sciences. He also responded to questions from the AC-ISE regarding artificial intelligence (AI) and the need to consider bias and ethics in computing and automated services. He noted that SBE and the Directorate for Computer and Information Science and Engineering (CISE) are partnering on ethics in AI and support the new program on "Ethical and Responsible Science." Lastly, the AC-ISE and Lupia agreed that the National Center for Science and Engineering Statistics (NCSES) sets the world standards on science indicators, measurements, and time trends and that highlighting the significance of NCSES will increase the positive visibility for NSF and SBE.

Discussion/Future Recommendations

Dr. Avery led the discussion on next steps for the AC-ISE. She was pleased at how well the virtual meeting functioned and was impressed with the depth of the topics discussed. She was also delighted that OISE has successfully increased its influence and exposure across the Foundation and has become a resource for NSF.

The Committee members commended Dr. Avery and Dr. Fortes for their work and dedication to the AC-ISE. Both served two terms (six years) and cannot be extended due to NSF policy. Coincidentally, Dr. Cordova's six-year term as NSF Director ends in March 2020. Dr. Keiser noted it will be important to promote international activities with a new Director.

The AC-ISE identified the following action items:

- Convene a working group on Africa that includes AC-ISE members as well as other experts.
- In light of the NSF change in leadership next year, draft a transition document that highlights the importance of OISE.

The AC-ISE agreed to consider the following topics for its next meeting:

- The National Academies' activity on international collaboration and competitiveness.
- A set of principles or questions that could be incorporated into international collaborations.
- Metrics and approaches for OISE to measure its effectiveness.
- The role of diasporas and migration in science.
- The role of infrastructure and how costs and materials can be shared internationally in addition to human capital development, noting that the American Academies of Arts and Sciences is preparing a report addressing infrastructure.