CGS/NSF Workshop: Globalizing Graduate Education and Research

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Introductory Remarks

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Good morning to you all, and welcome to NSF. I want to thank those from both NSF and the Council of Graduate Schools who organized this session. These include Debra Stewart and Daniel Denecke from CGS, along with Wanda Ward, Acting Assistant Director of Education and Human Resources; Carol Van Hartesveldt, Acting Division Director for Graduate Education; Carol Stoel, Program Officer in the Division of Graduate Education; and Gregory Anderson, who is our NSF and CGS Dean-in-Residence.

To the participants, many of whom have traveled a great distance to be here; your presence underscores the value you place on moving this important work forward.

As both a supporter of, and a participant in, this Workshop, NSF reaffirms its commitment to speeding global discovery and innovation. Collectively, we are here to encourage and enable exchanges of people and ideas around the world.

In this new century, we will see an acceleration of global economic dependency and the depiction of problems and solutions as global in nature as opposed to national or regional. Science has an increasingly important role to play in this changing world scenario.

In this new era, we must collaborate globally to prosper and thrive individually. We all know that the enterprise of science is both competitive and collaborative, and often the most competitive research and education programs are also those that are collaborative. We also recognize that robust collaborative projects are designed with a complementary mix of talents, of tools, and of location in mind.

Global collaborations and engagement enrich the enterprise of science in at least three ways.

First, global engagement makes for more vibrant lives and careers for our scientists and engineers.

Second, it advances science, as borne out by projects such as the Large Hadron Collider and the Integrated Ocean Drilling Program. It also advances science through the intellectual and social networks of smaller projects. One example is the research on vanishing languages that led to the movie entitled "The Linguists." Another example is

the project between Rice University and collaborators in Japan on carbon nanotube fabrication and characterization.

Third, global engagement enables and cultivates science diplomacy: the idea that through collaborations in science and engineering, we can enhance relations among nations.

Science diplomacy represents a shift from an emphasis on global competition to one on global cooperation. Envisioned in the light of cooperation, science diplomacy is broad-ranging. It can encompass collaborations between the US and other developed nations--projects such as the carbon nanotube program in which Japanese expertise in fabrication and US expertise in characterization complement each other. Science diplomacy also includes collaborations between the US and developing countries, in which US scientists and engineers work with colleagues in the developing nation to help build capacity to explore and to deal with issues such as climate change and water resource management.

Thus, science diplomacy is a new avenue for scientists and engineers acting in the sphere of public diplomacy to contribute to global prosperity and to create goodwill among nations. I invite you to help us to rethink the casting of why a federal agency -- NSF, in our case -- should accelerate its investments in international collaboration through graduate education.

At NSF, our objective in international projects is not merely to send US scientists, students and post docs to go abroad to work solo: rather, we enable US researchers to go work side-by-side with their international colleagues wherever the best opportunities for discovery prevail, anywhere in the world.

The US university system and NSF are rooted in the principle of integrating research and education. This co-mingling infuses and energizes both our domestic and international work. We also strive for seamless transitions from undergraduate through graduate school and into the early career stage for our younger scientists and engineers.

We also expect that funded projects will enable not just PI's but also students, particularly graduate students, and early-career scientists to join in the research abroad. This intent will continuously enhance research excellence through international collaboration and develop globally engaged researchers.

This pattern and process generate new knowledge, discoveries and inventions, while educating and mentoring young professionals—who, in turn, cultivate the next generation of scientists and engineers to fill the workforce needs of the future.

NSF currently funds several programs that specifically encourage internationalization of research & education and mobility of careers. These programs cover a range of career stages. I'd like to cite several examples.

1. For undergraduate and graduate students, the International Research Experience for Students (IRES) program funds international research experiences organized by US faculty for their US undergrad and grad students working abroad in collaborations. The scale of funding is $50,000 per year for 3 years

2. For graduate students, the Doctoral Dissertation Enhancement Projects support research by a US doctoral student working overseas with an international collaborator. We also support international experiences for graduate students participating in the Graduate K-12 STEM Fellows program, in the Integrative Graduate Education and Research Traineeship Program, and in the Graduate Research Fellowship program

3. For post-docs, the International Research Fellowships is our flagship program. It enables researches, within two years of receiving their doctorate, to travel anywhere in the world to do research from 9 to 24 months. These awards can also include support for dependents-an important component for early-career researchers with young families

4. For researchers at mid-career and beyond, the flagship program is the Partnerships for International Research and Education, or PIRE. PIRE aims to leverage unique, complementary resources and expertise among US and international partners. Current PIRE projects can be large scale, up to five years in duration and funded at up to $2.5 million. At this level of funding, we expect these projects will be transformational. Late last year, we announced the call for the third round of PIRE proposals. We have removed the cap on funding—not that we have an unlimited source of money, but rather to encourage the full creativity of the US PI's and their international collaborators. PIRE projects can be with any country and any institution. We expect them to involve US undergraduate and graduate students, post-docs and other researchers. The intent is not to fund equipment or instruments. The focus is on people and on the integration of research and education.

To conclude, let me reiterate that to survive and thrive, we must collaborate globally. The world is a polyglot of cultures and customs, but in every language we strive to improve the human condition and to create a better future for our children. We must realize these aspirations while preserving and protecting our planetary environment and bounty. Science and engineering provide our most hopeful and productive path to succeed. We are here today because we believe we can do this better through international experiences for our students – the next generation of researchers, innovators and educators.