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Moving Toward Global Science

WE ARE EXPERIENCING A NEW ERA IN THE ADVANCEMENT OF SCIENCE. MORE NATIONS recognize that innovation, driven by science and engineering (S&E), is the fuel for economic growth, prosperity, and social well-being. Global annual investment in R&D has doubled since 1996 to \$1.1 trillion. There is strong determination in countries large and small to be aggressively competitive in R&D growth, given the lure of innovation, the sway of geopolitical events, and tighter economic interdependence. Relative to their respective gross domestic products, China, India, Korea, Singapore, and Qatar are some of the nations that have substantially increased investments in S&E research and education, with a focus on the strategic development of their S&E workforce. Relative precollege student achievement rankings, intellectual property registrations, and authorship of scientific papers highlight a dynamic global balance. At the same time, the world has become highly interconnected, so that local economic shifts hinge not only on long-term support for scientific research in each country but also on creative global collaboration.

Cooperation in this context requires new thinking and an auspicious environment in which to cultivate and fortify this synergy. What strategies will move us there?

The most fundamental barriers to bilateral and multilateral international collaborations are disparate standards for scientific merit review and differences in the infrastructures that ensure professional ethics and scientific integrity. These factors are further exacerbated by cultural differences that arise from the large range of social perspectives and stages of national development. In addition, given the volume and speed with which unvetted data and information are generated and disseminated, there has never been a greater urgency to develop shared principles to address the delicate balance between the openness of scientific information and rigorous merit review that is built on a strong ethical foundation. To begin to address these issues, the world needs collectively developed global principles and procedures for scientific merit review. As a step in this direction, a global Merit Review Summit will convene in May 2012 in Washington, D.C., led by the U.S. National Science Foundation.

Although funding for U.S. and European S&E research is threatened by strained economies, U.S. and European universities continue to have a leading role in the international S&E innovation ecosystem and they are key drivers in emerging trends in science. In the United States, this success has relied on the competitive merit review mechanisms that federal science-funding agencies have developed and refined over the past 60 years for supporting fundamental research.

Deliberate institutionalization of both rigorous merit review and infrastructure for ensuring scientific ethics and integrity is essential in the international arena. Advances in these two areas will promote healthy multilateral collaborations, as U.S. institutions of higher learning and private organizations increasingly establish campuses, research centers, and joint degree programs abroad. This expansion, coupled with the increased international mobility of students and researchers, has enhanced the opportunities for harnessing diverse talents to pursue innovative projects.

The 2012 summit will develop a foundation for international scientific collaboration, elucidating acceptable merit review principles. A subsequent goal will be to establish mechanisms that put them into practice. It is hoped that this summit will lead to a permanent, but virtual, Global Research Council to promote the sharing of data and best practices for high-quality collaboration. With strong support from the White House and the U.S. State Department, as well as the international enthusiasm expressed for the summit, we are optimistic that practical approaches will be developed for the good of science everywhere.

— Subra Suresh

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