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## The Potential of Science Diasporas

*William J. Burns*

**T**WO powerful currents in today’s international landscape present important opportunities for American diplomacy: the unrelenting advance of scientific knowledge and innovation and the ever-thickening web of connections that brings diaspora communities and their homelands closer together. By making the most of these two trends, American diplomacy can accelerate innovation, prove that one nation’s benefit need not be another’s loss, and help our scientists come together to solve the health, environment, and economic challenges no government can solve on its own.

### Science Diasporas as Engines of Innovation

Like so much of American life, the story of innovation is a story of immigration—from Albert Einstein to Sergey Brin. In the United States, a quarter of foreign-born workers with college degrees work as scientists or engineers. According to a report by the Kauffman Foundation, foreign-born entrepreneurs started a quarter of U.S. technology startups over the past six years.<sup>1</sup> In Silicon Valley alone, 44 percent of these engineering and technology ventures were founded by at least one immigrant. As of 2010, one-third of the 314 laureates who won their Nobel Prizes while working in the United States were foreign-born.

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Through their collective brainpower, resources, and networks, organized diasporas of scientists, engineers, innovators, entrepreneurs, and science policy experts play a vital role in driving innovation and economic growth and improving cross-cultural understanding and collaboration.

## **Institutional Support of Diasporas: A Role for National and International Organizations**

The science, technology, and innovation (STI) diaspora remains a vastly untapped resource. Governments, research and educational institutions, professional organizations, and the private sector can each do more to make the most of the ties that bind our far-flung scientific communities.

Over the past few years, American diplomacy has sought to support the efforts of science diasporas. The U.S. Department of State and U.S. Agency for International Development (USAID) co-hosted the second-annual Global Diaspora Forum in July 2012. At that event, I announced the formation of the Networks of Diasporas in Engineering and Science (NODES), a partnership between the State Department, the American Association for the Advancement of Science (AAAS, publisher of *Science & Diplomacy*), and the National Academy of Sciences and the National Academy of Engineering.

Since its launch, NODES has facilitated the formation of robust and sustainable diaspora knowledge networks all over the world. NODES hosted panel discussions at the 2012 Global Diaspora Forum and co-hosted a half-day meeting with the Embassy of Ireland and Science Foundation Ireland on science diasporas at the 2013 AAAS Annual Meeting. These opportunities allowed diaspora groups around the world to share best practices with one another.

One of the groups that participated in the Forum was the Turkish American Scholars and Scientists Association (TASSA). TASSA's mission is to promote educational, scientific, and technological cooperation between Turkey and the United States through scientific exchanges, educational programs, and networking for its three thousand members. Since its founding in 2004, TASSA has served as a vibrant scientific bridge between Turkey and the United States. Thanks to funding from TASSA and the Turkish science funding agency TUBITAK, Gizem Donmez, a neuroscientist at Tufts University, was able to expand collaboration with her colleagues in Turkey, attract talented students to her laboratory, and advance her important research on neurodegenerative diseases. Professor Donmez's experience proves that communities of diasporas working in very strong networks can advance scientific discovery farther and faster than any individual can do on his or her own.

Another participant in the Global Diaspora Forum was the Wild Geese Network of Irish Scientists (WGNIS). One of the things that makes WGNIS especially effective is that it not only enables connection, communication, and collaboration among Irish scientific, technological, and engineering diaspora members, but it also

actively works to link academia and the private sector. Members are included in policy meetings to foster international research collaboration, serve as consultants for the media on Irish-U.S. science issues, and advertise STI-related employment opportunities in the two countries.

Institutions of higher education have a unique role to play in linking diaspora communities. International students and alumni and foreign-born faculty can serve as links for collaboration, recruitment, and mentoring. To strengthen a new institutional focus on renewable energy research, Boston College took advantage of its historic connection to Ireland and the Emerald Isle's extensive experience in green energy, and teamed up with the WGNIS network to find and bring together Irish and Irish-American scientists, students, policy makers, and industry representatives to identify potential research and innovation partnerships.

Scientific and engineering professional societies can collaborate with their counterparts around the globe to strengthen the connections between diaspora groups. For example, the Ethiopian Physics Society in North America connects the American and Ethiopian physics communities by awarding prizes for research excellence to Ethiopian students, supporting a mentoring network, enabling recruitment of students from Ethiopia to the United States, and helping to organize international physics meetings in Ethiopia.

Academies of science can also support the development of STI diasporas. Science-related NGOs can serve as powerful catalysts for international collaboration by building science capacity at home and abroad, strengthening the networks that diaspora groups can use to connect with academic and private sector partners across the globe, and advocating for policy reform. Joseph Rotblat and the Pugwash Conferences on Science and World Affairs offer a terrific example of how scientists around the world can come together to offer concrete proposals to address global challenges. For their efforts to reduce the nuclear threat, Rotblat and Pugwash won the 1995 Nobel Peace Prize.

Industry-based groups can also make significant contributions, including by hosting mentoring activities for members of the diaspora, reviewing business plans, recruiting personnel across national boundaries, and sharing insights into technology transfer within and across sectors. Lastly, the U.S. government's embassy and consular offices have an important role to play in linking science diasporas. Many of these initiatives already occur, but there is much more all of us can do.

## **Opportunities for Engagement**

As development agencies turn to more science-based approaches, science diasporas can tap the expertise and dedication of their members to accelerate international development efforts. For instance, Partnerships for Enhanced Engagement in Research (PEER) Science, a collaboration of USAID and the

National Science Foundation, promotes bilateral and regional cooperation between American scientists and their colleagues in emerging economies to address global development challenges.

The PEER program has already enabled a number of transformational partnerships across diaspora networks. Sachchida Nand Tripathi from the Indian Institute of Technology Kanpur has been working with the University of Minnesota's Anu Ramaswami to develop low-carbon cities in India. Julio Eduardo Cañón from the University of Antioquia in Medellín, Colombia, and Francina Dominguez at the University of Arizona in Tucson are addressing the impacts of climate change on tropical wetlands in Colombia. Victor Cantillo from the Universidad del Norte in Colombia and José Holguin-Veras from the Rensselaer Polytechnic Institute formed a team to work on integrated humanitarian logistics systems to help developing countries design effective emergency management systems for post-disaster relief operations.

Diaspora communities are also especially well suited to support the promotion of global entrepreneurship. At the 2012 Global Diaspora Forum, USAID launched the Diaspora for Development Initiative, a public-private partnership with Accenture LLP and Cuso International designed to promote the mobilization of diaspora communities to address human resources gaps in developing countries. To date, seventeen volunteers have been deployed to Ethiopia, Kenya, Jamaica, the Philippines, and Peru, where they have provided entrepreneurship skills and sustainable livelihood training to more than four hundred individuals, many of them women.

Another important entrepreneurship program is our Global Innovation through Science and Technology (GIST) initiative. GIST links young innovators with experienced mentors who help them turn their technology ideas into companies. For example, young Pakistani entrepreneurs committed to contributing to their country's economic development were able to receive coaching from Pakistani-American Faysal Sohail, founder of two U.S. computer chip companies and a general partner at a Silicon Valley venture capital fund. These connections not only support innovation but also provide the foundation for the kind of relationships that contribute to mutual understanding and respect.

## **A New Architecture of Cooperation**

The information and technological revolutions are reshaping diplomacy in the twenty-first century. The near monopoly of governments in the management of international affairs has certainly been broken. Diaspora networks, like nongovernmental organizations, civil society groups, and multinational corporations, are increasingly important and influential actors in international relations. Science diasporas are vital to a new architecture of cooperation that will allow us to invent, create, innovate, and solve problems together.

There is no single formula for developing and growing a science diaspora network as a platform for cooperation. Each will be a unique outcome of a country's culture, history, international relations, political system, economic development, and geography. Nonetheless, the fact that a recent study of science diaspora communities worldwide found that the United States is still the top destination for foreign scientists and engineers signals that we can play a leading role in promoting science diasporas.<sup>2</sup>

To continue to lead in the century unfolding before us, we must not only sustain strong domestic scientific and engineering capabilities and investment, but also strengthen science diaspora communities and support their efforts to build a more peaceful and prosperous world. **SD**

#### **Endnotes**

1. Vivek Wadhwa, *The Immigrant Exodus: Why America Is Losing the Global Race to Capture Entrepreneurial Talent*, (Kauffman Foundation, 2012).
2. Richard Van Noorden, "Global mobility: Science on the move," *Nature*, October 17, 2012, <http://www.nature.com/news/global-mobility-science-on-the-move-1.11602>.