

## TOWARD THE IMPLEMENTATION OF A GLOBAL SCIENCE CORPS

*I propose establishing an International Corps for Global Science to allow science missionaries, young and old, to help build a global culture of science by working in those parts of the world that are underserved by science now. How would this work? Obviously it would require funds from public or private sectors. ...It would need eager participants. They could range from newly-minted science graduates, looking for an experience akin to that offered by the U.S. Peace Corps, to more senior scientists...who would enjoy working on new problems in an unusual setting, with the prospect of contributing to a better world. Finally, it would be essential to link this new initiative with other on-going efforts to nurture science in the developing world. A zeal for science will not suffice. Our missionaries will need a reasonable context in which to work, one that includes trained nationals, appropriate equipment, and a friendly political environment.*

Dr. Harold Varmus  
Nobel Prize Centennial  
Stockholm, December 2001

### **Background**

In the eight years since Dr. Varmus' inspiring speech at the Nobel Prize Centennial, his proposal for a Global Science Corps (GSC) has drawn attention and accolades from a broad cross-section of the scientific community around the world. At a 2006 GSC planning workshop in Nairobi, co-sponsored by the Science Initiative Group (SIG)\* and the United Nations Development Program (UNDP), participants from twelve African countries as well as the U.S. and Canada strongly endorsed the GSC concept: year-long placements of fellows from scientifically advanced countries at universities and research institutes in developing countries to share expertise, help build local capacity, and collaborate with local partners.

The GSC is meant to enhance the teaching and research capacity of host institutions, help to build science and technology capacity in host countries, and provide a professionally rewarding experience for the fellows. Enthusiasm has been high among prospective hosts in Africa and would-be GSC fellows in the U.S. and Canada, with particular interest within Diaspora communities. Scientific institutions, universities, government agencies, multi-laterals, and NGOs have expressed keen interest in the GSC concept. SIG has committed to overseeing the program in partnership with the Council for International Exchange of Scholars (CIES), a division of the Institute of International Education (IIE) that is well known for its expertise and extensive experience in conducting international exchange programs for scholars, educators and university administrators. Especially compatible with the aims of the GSC is the experience of IIE/CIES in

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\* SIG is an international team of senior scientists dedicated to fostering science in developing countries. Formed in 1999 to provide scientific and administrative oversight for the Millennium Science Initiative, SIG is governed by a six-member board and administered by a small staff based at the Institute for Advanced Study in Princeton, New Jersey. Phillip Griffiths, Professor Emeritus of Mathematics and Past Director of the Institute for Advanced Study, chairs the SIG board. Harold Varmus, President of Memorial Sloan-Kettering Cancer Center and Co-Chair of the U.S. President's Council of Advisors on Science and Technology, is a SIG board member.

administering the Fulbright program on behalf of the Bureau of Educational and Cultural Affairs of the U.S. Department of State.

### **The Global Science Corps: Getting Started**

SIG proposes to initiate the GSC by placing 15-20 fellows. That modest number will allow the program to begin quickly and efficiently with the existing staff and administrative infrastructure already in place at SIG and CIES. In subsequent years SIG plans to seek resources to place as many as several hundred fellows annually, with the complementary goals of making a meaningful impact on scientific research and training in the developing world and expanding the global competence and awareness of scientists and engineers from developed countries.

GSC placements will be for one academic year and will be open to scholars from all academic ranks from post-docs through retirees. SIG is prepared to administer in collaboration with IIE/CIES all aspects of the program, including scholar recruitment, selection, placement, travel arrangements, visas, insurance, pre-departure orientation for selected scholars, orientation of selected host institutions and other relevant activities. The host institutions will be expected to provide in-country support including office space, laboratory space, and assistance with local arrangements such as housing and in-country travel. Funding is being sought to cover comprehensive compensation packages for GSC fellows and for program administration activities. The estimated total cost to support each fellow, including program administration, ranges from \$75,000-\$150,000 depending on seniority, destination, and other factors.

### **GSC Fellows**

Based on feedback to introductions of the GSC through lectures and articles, and on discussions with universities, there appears to be a strong interest in the GSC program among potential fellows and host institutions. SIG intends to work with a number of membership organizations to recruit GSC fellows, potentially including the Association of Public and Land-grant Universities (APLU), the Association of American Universities (AAU), and Association of Universities and Colleges of Canada (AUCC). SIG will also work with individual universities, professional societies, Diaspora groups and other institutions and organizations as appropriate to identify and recruit GSC fellows in particular disciplines or for specific geographic areas.

### **Partnerships and Adaptability**

SIG seeks to establish mutually beneficial partnerships with a variety of organizations, each with the capacity to support a distinct aspect of the Global Science Corps.

One of the hallmarks of SIG is its flexibility to adapt quickly to circumstances, and this holds true for the implementation of the Global Science Corps. As a new program with multiple potential partners, the GSC can be shaped to the priorities of the different organizations involved, as long as the essential element remains firm: placements of one academic year or longer for talented scientists at laboratories and other research facilities in the developing world.

For example, a foundation or national laboratory concerned with neglected or tropical diseases might support researchers spending a year at a medical university such as Muhimbili in Dar es Salaam or at a site specializing in natural products chemistry, e.g. the African Centre for Gene Technologies in Pretoria. A U.S. government agency seeking to expand the corps of fellows conducting meaningful scientific research or teaching math, science, and engineering in local universities in the developing world might support year-long placements for recent PhD's (or

retired professors) in Africa, Latin America or Indonesia. As science ambassadors to developing countries, these GSC fellows would support the effort of the U.S. government to promote science diplomacy.

SIG has access to a range of host sites, but placements would not have to be limited to these; SIG can draw on its international network of contacts to identify and screen host institutions in other countries and/or fields if desired, or facilitate placements at sites designated by a partner organization or GSC candidate. In addition, SIG's partnership with IIE/CIES will make a world-wide network of potential host institutions available to the GSC.

Another SIG partner, the Global Knowledge Initiative (GKI), will work with SIG to identify placement opportunities and make mutually productive matches, with emphasis on Indonesia and other Muslim majority countries. The mission of GKI is to create, optimize, and sustain knowledge partnerships between individuals and institutions of higher education and research. GKI and SIG will partner to develop a set of services that support fellows once they are on the ground and to ensure sustainability of the ideas and initiatives generated by the fellows.

Host country and institute priorities will be taken into account, with care taken to avoid placements where fellows provide a stimulating but destabilizing presence. Considerations of U.S. national priorities in the host regions will also play a role.

While SIG has identified strong partners and a compelling model for GSC, funding remains elusive, and SIG continues its efforts to raise major funding. Meanwhile the launch of a successful pilot program, as well as a series of related efforts, illustrate the significant potential of the GSC.

### **GSC Activity in Cameroon**

With a small balance in a 2006 planning grant from UNDP, SIG has been supporting a pilot activity in the spirit of the GSC. Dr. Appolinaire Djikeng, originally from Cameroon and now a staff scientist in the Infectious Disease Group of the J. Craig Venter Institute in Maryland, was appointed Adjunct Assistant Professor in the Department of Biochemistry and Microbiology of the University of Buea, where he has committed to teach twice per year in 2008, 2009 and 2010. SIG is supporting his travel and some minor equipment for the university; Dr. Djikeng is contributing his time. Dr. Djikeng has developed and taught MSc-level courses at the University of Buea in bioinformatics resources, functional genomics, and molecular biotechnology, and also has served as an ambassador for the GSC among his colleagues in the U.S. and Africa.

### **Complementary Initiatives: Africa**

*The Regional Initiative in Science and Education (RISE)* prepares PhD and MSc-level scientists and engineers to teach in African universities through university-based research and training networks. Funded by Carnegie Corporation of New York and administered by SIG in partnership with the African Academy of Sciences, RISE comprises five networks involving nine countries in sub-Saharan Africa. Research areas include materials science, water resources, natural products science and engineering, biochemistry and informatics for natural products, and marine science. Most of the fifteen universities and research institutions that are part of RISE would be suitable host institutions for the GSC, and placement at RISE locations would have obvious benefits for both the GSC fellows and the departments where they are based. RISE has a

presence in Botswana, Kenya, Malawi, Mozambique, Namibia, Nigeria, South Africa, Tanzania, and Uganda.

*The African Renaissance Institute of Science and Technology (ARIST)* is a joint effort of a group of African scientists in the Diaspora and their colleagues in Africa. Effectively a virtual institute, ARIST is made up of departments located in existing universities in Africa where there is already some level of expertise and some collaboration with non-African universities. Visiting faculty come primarily from the Diaspora, and in addition to teaching they work closely with permanent faculty to help develop African research and teaching capacity. Initial programs include water and environmental engineering, materials, biomedical and health sciences, and energy engineering. ARIST departments may serve as GSC host locations. Initial ARIST partnerships are in place or planned with universities and research institutes in Burkina Faso, Cameroon, Egypt, Ethiopia, Ghana, Kenya, Nigeria, South Africa, and Tanzania, with others to follow.

### **Indonesia**

The Indonesian scientific community, under the leadership of the President of the Indonesian Academy of Sciences, is keen to strengthen the country's scientific institutions and establish a culture of science and has expressed interest in hosting GSC fellows. The US Embassy in Jakarta would facilitate Indonesian involvement with the GSC.

### **Chile and Brazil**

Millennium Science Institutes in Chile and National Institutes of Science and Technology in Brazil are also potential host sites for the Global Science Corps. These two programs, now fully managed and funded by their national governments, both grew out of the Millennium Science Initiative established in the early 2000's through a partnership of SIG and the World Bank.

### **Time for a Global Science Corps**

Recent events, including efforts of the U.S. government to promote science diplomacy and the advent of the complementary initiatives described above, offer renewed prospects for a full-fledged GSC that provides meaningful research opportunities for GSC fellows in Africa and other parts of the developing world.

SIG looks forward to working with partner organizations to create a vibrant Global Science Corps that builds on the strengths and interests of all involved. This is a time of renewed hope for science and for international cooperation. SIG welcomes partners in this unique undertaking.

*We will restore science to its rightful place, and wield technology's wonders to raise health care's quality and lower its cost. We will harness the sun and the winds and the soil to fuel our cars and run our factories. And we will transform our schools and colleges and universities to meet the demands of a new age. All this we can do. And all this we will do. ... To the people of poor nations, we pledge to work alongside you to make your farms flourish and let clean waters flow; to nourish starved bodies and feed hungry minds.*

President Barack Obama  
Inaugural Address  
January 20, 2009