FIP Forum on International Physics
The American Physical Society
December 2002

View From the Chair

Bruce Barrett, University of Arizona

As the FIP Chair for 2002, I first want to thank David Ernst for his excellent leadership and service to FIP (and CISA) over the past four years. Dave has been a guiding light for FIP and has done so much to infuse FIP with a new energy. We will miss Dave's insight and experience as he now steps down from the FIP Executive Committee.

I will not comment on the role of FIP within the APS, because David Ernst did such a fine job of this in the June 2001 FIP Newsletter. Those of you who have not read it can do so on the FIP webpage (www.aps.org/fip/).

FIP has many activities, including the organizing of sessions at the March and April APS meetings. The topic of the session at the March meeting in Indianapolis was ``Science in Developing Countries: European and USA Perspectives." At the April meeting in Albuquerque, FIP had organized a session on the International Center for Theoretical Physics (ICTP) in Trieste, Italy, titled ``The Abdus Salam ICTP: Its Role in International Science." The featured speaker was Miguel Virasoro, the retiring director of the ICTP, who presented the Beller Lecture in this session.

At the March meeting, FIP will also host a reception following its session. In Albuquerque, the FIP, DNP, DPF and FHP co-sponsored a session on the Eugene Wigner Centennial. Many of you attended these FIP sessions.

Another important FIP program is the election of members to Fellowship in the APS. FIP selected ten new APS Fellows for 2002. Those new Fellows who attend either the March or April APS meetings will receive their fellowship certificates there. Please make your fellowship nominations to the FIP for the coming year before the April 1, 2003, deadline.

I encourage all of you to become active in FIP and to speak to your colleagues in the APS about joining FIP, so as to sustain and to increase our membership. I look forward to seeing you at forthcoming FIP functions.

In this Issue

Women's International Science Collaboration (WISC) Program 2001-2003

Submitted by Michele Irwin

The American Association for the Advancement of Science (AAAS) Directorate for International Programs announces the Women's International Science Collaboration (WISC) Program for 2001-2003. Supported by the U.S. National Science Foundation (NSF), this program aims to increase the participation of women in international scientific research by helping establish new research partnerships with colleagues in Central/Eastern Europe, Newly Independent States of the former Soviet Union, Near East, Middle East, Pacific, Africa, the Americas, and Asia.

Small grants ($4,000-5,000) will provide travel and living support for a U.S. scientist and, when appropriate, a co-PI to visit a partner country to develop a research program. Funds can also be used to support a second visit to the partner country or for a foreign partner to travel to the U.S.

Men and women scientists who have their Ph.D. or equivalent research experience are eligible to apply. Applicants who have received their doctoral degrees within the past six years will receive special consideration, as will scientists applying to work with colleagues in less frequently represented countries and regions.

With the exception of applications involving the Americas, applications from male co-PIs must be accompanied by an application from a female co-PI as part of a U.S. research team (please contact M. Ratchford, see below, regarding special guidelines for the Americas). Male and female graduate students (Ph.D. candidates) are also eligible to apply if they will be conducting research in an established Ph.D. program in the U.S. and will be traveling with their Ph.D. advisor and will serve as co-PI on future proposals. (Male graduate students will need a female co-PI.) Applicants must be citizens or permanent residents.

Only fields funded by the National Science Foundation and interdisciplinary research cutting across these fields are eligible. For further information, please visit the NSF website (http://www.nsf.gov), or contact one of the AAAS administrators listed below.

Two competitions will be held, with application deadlines of January 15 and July 15. Approximately 40 awards will be made in each competition.

For further application information and region-specific guidelines, please visit http://www.aaas.org/international/wiscnew.shtml or contact the appropriate AAAS administrator:

-Central and Eastern Europe, Newly Independent States (NIS) of the former Soviet Union: Karen Grill, kgrill@aaas.org.

-East Asia and Pacific: Suteera Nagavajara, snagavaj@aaas.org, (202) 326-6496.

-Africa, Middle East, Near East, and South Asia: Alan Bornbusch, abornbus@aaas.org, (202) 326-6651.

-Americas and Caribbean: Marina Ratchford, mratchfo@aaas.org, (202) 326-6490.

Or, please write to (AAAS contact):

WISC Travel Grant
American Association for the Advancement of Science
Directorate for International Programs
1200 New York Avenue NW, Washington, D.C., 20005.

Fellowship Nominations

The Forum on International Physics can sponsor the election to fellowship of a member of the American Physical Society. The Forum is anxious to recognize our foreign members who meet the criteria for fellowship. The deadline for nominations for FIP is April 1, 2003. Complete instructions can be found at:

http://www.aps.org/fellowship/fellinfo.html

The procedure is for the nominator to submit an official nomination form signed by himself and one other member of the APS, together with a vita and a number of supporting letters to:

Executive Officer
American Physical Society
One Physics Ellipse
College Park MD 20740-3844
Attn.: Fellowship Program

It is very important that you support your colleagues and nominate them for fellowship in APS.

Dealing With Nukes And Terror

Pervez Hoodbhoy, Professor of Nuclear and High-Energy Physics, Quiad-e-Azam University, Islamabad, Pakistan

Post September 11: although Pakistan's military government insisted that there was no danger of any of its 25-40 nuclear weapons being taken for a ride by some radical Islamic group, it wasn't taking any chances. Several weapons were reportedly airlifted to various safer, isolated, locations within the country, including the northern mountainous area of Gilgit. This nervousness was not unjustified – two strongly Islamist generals of the Pakistan Army, close associates of General Musharraf, had just been removed. Dissatisfaction within the army on Pakistan's betrayal of the Taliban was (and is) deep; almost overnight, under intense American pressure, the Pakistan government had disowned its progeny and agreed to wage a war of annihilation against it.

Fears about Pakistan's nukes were subsequently compounded by revelations that two highly placed members of the nuclear establishment, Syed Bashiruddin Mahmood and Chaudhry Majid, had journeyed several times into Afghanistan during the last year. Both scientists are well known to espouse radical Islamic views (I have had more than one acrimonious public exchange of letters with SBM on these matters about 13 years ago). SBM has been photographed with Osama Bin Laden. They are currently under intensive interrogation by Pakistani and US intelligence.

It is not impossible that the two Pakistanis could have provided significant nuclear information or materials potentially useful to Al-Qaeda's allies and subsidiaries in other parts of the world. If it turns so out, this will scarcely be the first instance of nuclear leakage. Among other examples, sympathizers of Israel working in the US nuclear establishment were instrumental in providing large quantities of uranium during the 60's for the Israeli nuclear weapons program.

Pakistan's loose nukes underscore a global danger that may already be out of control. The fissile materials present in the thousands of ex-Soviet bombs marked for disassembly, the vast amounts of radioactive materials present in nuclear reactors and storage sites the world over, and the abundance of nuclear knowledge, make it only a matter of time before some catastrophic use is made of them.

So what is the solution? Obviously tight policing and monitoring of nuclear materials and knowledge is essential. But this is far from sufficient. If nuclear weapons continue to be accepted by nuclear weapon states as legitimate instruments of either deterrence or war, their global proliferation – whether by other states or non-state actors – can only be slowed down at best. By what moral argument can others be persuaded not to follow suit? Humanity's best chance of survival lies in creating taboos against nuclear weapons, much as already exist for chemical and biological weapons, and to work rapidly toward their global elimination. The US, as the world's only superpower, must take the lead.

These are difficult times to make such an argument. The White House is celebrating victory over Al-Qaeda. But terrorism does not have a military solution. Soon there may be still stronger, more dramatic proof. In the modern age, technological possibilities to wreak enormous destruction are limitless, and nuclear means are one awful possibility. Anger, when intense enough, makes small stateless groups, and even individuals, extremely dangerous.

American triumphalism must therefore give way to a more rational, long-term defense of US interests and security. These ultimately lie in ameliorating conflicts and rationally dealing with complaints against its international behavior. It is time for the US to re-engage with the people of the world, especially with those that it grievously harms. As a great country, possessing an admirable constitution that protects the life and liberty of its citizens, it must now extend its definition of human rights to cover all peoples of the world.

Teaching Opportunity at the University of Fort Hare, South Africa

David J. Ernst, Vanderbilt University

The Physics Department of the University of Fort Hare, South Africa, is looking for retired individuals who would be interested in teaching a course there.

Fort Hare is an institution of historical importance in South Africa. It has been primarily devoted to the education of blacks and many blacks of prominence in Africa secured their education there. Nelson Mandela is one. The South African government is interested in refurbrishing the university and one area of need is the present physics department. There is money from the European Community, the U.N. and the U.S. which can assist in these things but that involves long range planning and development when the department needs immediate assistance.

We would like to explore with the American Physical Society the possibility of attracting retired professors of physics to do one course a year for the Fort Hare Department to meet this need. They could be accommodated in Hogsback, a mountain town of beauty and the alleged site of J.R.R. Tolkien's inspiration for his book: "The Lord of the Rings". The exchange rate would allow them extremely comfortable living and there wouuld be ample time for them to mingle with the wildlife, the scenary and to write their book.

Further information can be found at the Fort Hare website: www.ufh.ac.za. If interested, please contact the present Dean of Science, Prof Daniel Okeyo, and the previous acting Dean of Science, Prof Joanne Tyler. The impetus for this approach took place under Prof Tyler and will continue with the hearty endorsement of Prof Okey. Their email addresses are respectively: dokeyo@ufh.ac.za; jtyler@ufh.ac.za.

Physics In Cuba

Marcelo Alonso, Florida Institute of Technology

After 40 years of absence I returned twice to Cuba, in January and December of 2000, to participate as guest lecturer in two international scientific meetings. The first meeting dealt with Physics Education, was organized with the collaboration of several universities in Spain, particularly UNED and UNESCO, and was held at the University of Havana. The second meeting dealt with current issues related to QM, in particular QFT, organized with support of the ICTP, was held at the Institute for Cybernetics, Applied Mathematics and Physics (ICIMAF), a research institute that depends on the Cuban Ministry of Sciences, Technology and Environment (MSTE). In addition to a few participants from Europe, US and Latin America, the two meetings were well attended by Cuban physicists.

International meetings are very useful for Cuban physicists, whose travel possibilites are very limited unless financed by foreign sources, and thus offer them the opportunity to interact with foreign colleagues. For me the meetings were very useful because I could talk at length with several Cuban physicists, allowing me to get first hand information about physics education and research, as well as on higher education in general, in Cuba. Both have changed during my absence. Prior to 1959 there were three official universities, Havana, Central and Orente, and one private, Villanueva. Now there are several official universities, polytechnic institutes and pedagogical institutes, so that higher education is rather diversified.

On both occasions I was able to visit the University of Havana, where I had been professor of Theoretical Physics until 1960. The main campus, on a hill, with a neoclassic architecture and access by an imposing stairway of 45 steps, about 20 m wide, remains the same except that the use of some buildings has changed because the academic structure of the university has also changed. For example, Physics is now in the old Engineering building and Engineering has been moved to the new Higher Polytechnic Institute “Jose Antonio Echeverria” (ISPJAE), close to the airprot, and the Faculty of Medicine has been incorporated into an Institute of Health Sciences independent to the university. Unfortunately the buildings are not well maintained, but that is a general problem in Cuba. Only two universities in Cuba offer a degree in physics: the University of Habana, in Havana, and the University of Oriente, in Santiago, although other universities offer physics courses for students of Chemistry, Engineering, Biology, etc.

I found that in comparison with my time the physics curriculum in the University of Habana has been reorganized substantially and the academic staff expanded considerably. The Faculty of Physics, headed by a Dean, consists of three Departments: General Physics, Theoretical Physics, and Applied Physics, with a total academic staff of 69 persons with about 40 holding a PhD. The faculty offers a 5-year “licenciado” curriculum, that is a much more comprehensive curriculum than that of bachelor in the US, so that a “licenciado” degree can be considered having a level between bachelor and master degrees in the US. Beginning with the third year, students must work in some laboratory, and at the end of the 5th year, students must submit a thesis in order to obtain their diploma. Master and PhD degrees are also offered, that are to a greater extent comparable to the US. At least a master degree is required to teach in a University. My general impression is that the physics students, that currently are about 100, and the staff are very well prepared, in spite of severe limitations in resources (equipment and library).

In many cases students can take graduate courses or do their Master or PhD thesis in some of the research institutes that operate under the Ministry of Science, Technology and Environment, such as the Institute of Cybernetics, Applied Mathematics and Physics (ICIMAF) mentioned earlier, and the Advanced Institute for Nuclear Science and Technology (ISCTN) that offers 5-year “licenciado” and PhD degrees in Nuclear Physics and in Nuclear Engineering.

In addition to the two universities and research centers offering advanced physics degrees, there are 16 Higher Pedagogical Institutes that offer a 5-year “licenciado” degree in Education with specialization in Physics Education. This degree is required to teach physics in secondary schools, although university physics students must take courses on the didactic of physics, just in case they decide to teach.

It should be mentioned that students after graduation must work up to two years in some government research center or equivalent (social work). Also in addition to the physics courses students must take courses of social and political content, a tradition that existed in the former soviet universities but is not common in US institutions.

It is important to note that during the period of Soviet influence in Cuba, that began early in the 60’s and lasted until the demis of the Soviet Union, around 1996, many Cuban scientists were trained in Russian centers, mostly in Moscow and St. Petersburg (formerly Leningrad), as well as in some East European countries, such as Hungary. The Cuban scientific establishment was patterned after the Soviet organization of science, with universities and technological institutes providing mainly scientific and engineering education, and most of the research done in governmental specialized institutes operating under the Cuban Academy of Sciences, the Ministry of Science, Technology and Environment, or other government agencies, a structure that still exists.

In a centrally planned and operated economy as is the Cuban system, all job opportunities are in governmental institutions. Although this assures that graduates will find a place to work, the choices are limited by the places where jobs exist, and jobs are assigned according to the applicants qualifications and other technical reasons. In particular, to be considered for a postion (research and teaching) in a university, the "licenciados" in physics must have graduated with an average of at least 4.0 points out of 5.0, and must take advanced courses related to the didactic of the areas in which they will teach. In addition to working in universities and other educational institutions, Cuban physicists work in research centers of the Ministry of Science, Technology and Environment and other government agencies, in hospitals and biomedical research centers, and in industrial technical services. The main fields in which Cuban physicists work or do research are (1) optics, lasers and spectroscopy, (2) condensed matter and materials physics, (3) electronics and computation, (4) non-conventional energies, mostly solar, (5) biophysics and medical physics, (6) geosciences, (7) theoretical physics (complex systems, cybernetics, particle physics, field theory, etc), (8) nuclear physics, (9) teaching, and (10) physics education research at all levels. In some instances it is a combination of fields.

Currently there are in Cuba about 1600 physicists, of which about 180 are PhDs, and about 700 are engaged in research. There is a Cuban Physical Society, with about 500 members, that publishes the Cuban Journal of Physics, three issues per year. Other technical journals, some of popular nature as "Energy and You" (Energia y Tu) published by CubaSolar and "Nucleus" published by the ISCTN, are available. Besides research, physics education at all levels receives special attention and several semi popular journals have that orientation.

An important difference with the US is that ALL students when they finish secondary (high) school have taken physics. In elementary school, students start taking science courses, with some physics content, since third grade. However physics as an "obligatory" course for secondary (high) school students is taught in grades 7th through 12th, that is six formal courses. All physics teachers in secondary schools must be "licenciados" in Physics Education, graduated from a Higher Pedagogical Institute. Thus in spite of possible deficiencies in laboratory and computing equipment, secondary (high) school graduates are much better prepared in physics (as well as in mathematics and other subjects) than their counterpart in US. In fact, Cuban students have been very successful in International Physics Olympics.

If I am asked what is the best way to help physicists in Cuba, I would recommend as first priority to establish a modest fund to invite Cuban physicists to attend conferences and seminars in the US, and to teach one semester courses or work with a research group in US academic institutions. Considering how inexpensive it is to travel between Miami and Havana ($300 round trip) I assume that the amount needed per individual physicist would be of the order of $2,000 to $5,000 depending on the place and length of stay. Organizing seminars in Cuba, in which US physicists would participate, would be my other priority. I hope very much that funds for these two purposes can be found. The AIP co-sponsored in April of 2002 a meeting on Medical Physics, a very important subject in Cuba, and is currently contemplating a seminar on Physics Education in 2003. Also the Polytechnic Institute Jose Antonio Echevarria (ISPJAE) has organized conferences on physics education for engineers (EFING) at which participants form outside Cuba have participated but no organization for US was involved. The last EFING was held in June of this year.

Perhaps a private foundation or some corporation could contribute some seed money for initiating a modest exchange program between US and Cuban physicists. The physics department of the Florida Institute of Technology would be prepared to provide the technical and administrative support to the program.

The author wishes to thank Dr. L. Baksay, PSS department head of Fla. Tech, and to Lynn McDivitt, administrative assistant, for their support in the preparation of this note.

General Statistics

- Number of Physicists ~ 2000 licenciates (bachelors); ~200 PhD
- Active in Research ~ 800
- Physics Teachers ~1200
- Areas of Work:
  - Teaching and Research
  - Research Institutes of the Ministry of Science
  - Technology and Environment
  - Biomedical Research Centers and Hospitals
  - Labs in Industry
- Incoming Freshmen ~ 60 (from Highschool)
- Annual Degrees ~ 40 licenciates; 8 PhD
- Cuban Physical Society (est. 1978) ~ 600 Members
- Cuban Journal of Physics: Founded 1981

Working Fields

- Physics Teaching (at all levels)
  - Technology and Environment
  - Preparation of Materials and Computer Programs
- Optics and Spectroscopy
  - Laser Applications in Industry and Medicine
  - Optical Methods of Analysis, Diagnosis, Transmission, Storage and Processing of Information. Holography.
- Condensed Matter Physics
- Instrumentation, Electronis and Computation
  - Design, Fabrication and Characterization
- Theoretical Physics
  - Quantum Field Theory
  - Mathematical Modeling
  - Molecules and Crystals Modeling
- Medical Physics
  - Radiotherapy and Dosimetry
  - Physical Methods for diagnosis and therapy
  - Neuroscience
  - Genetic Engineering
- Nuclear Physics
  - Nuclear Structure and Reactions
  - Neutron Activation Analysis Applications
- Non-Conventional Energies
  - Photovoltaic Cells and Panels
  - Nuclear Power Reactors
- Earth Science
  - Meteorology, Climatology, Seismology, Solar Activity,

No International Exchange, No Science

Irving A. Lerch, APS International Affairs

The most oft-quoted pro-science declaration of 2001 is Allan Bromley's March 9 ***New York Times*** Op-Ed which concludes with, "No science, no surplus. It's that Simple."

The assumption on which Allan's statement stands is that funding is needed to nourish a well-lubricated machine to convert intellectual capital into new science and which, in turn, transforms technological innovation into economic expansion. The problem is that ill-considered legislation and State Department policies and procedures threaten to throttle the international intellectual exchange on which our scientific and economic prosperity depends.

The US domestic science enterprise is part of a global machine whose bells and whistles bear the many labels of widely varying national origins. Thirty-five percent of all doctorates granted by US institutions in the natural sciences and engineering go to foreign scholars and this is roughly the same as the percentage of foreign scientists resident in US research universities. Cut off this source of erudite input and the machine grinds to a halt. This may be happening now.

In the immediate post-war era, roughly 70% of the world's research productivity in the natural sciences originated in the US. This was the result of the fact that the world's scientific talent gathered in this country to exploit the largest and most unique research facilities available in a world devastated by world war. Today, when 70% of the articles published in ***The Physical Reviews*** is proffered by foreign authors, US submissions have become a declining minority presence in a domestic publication once dominated by US physicists.

Of course this is not quite true. It is not possible to portray domestic US science as a purely nationalist venture. As a nation of immigrants, our academic community has benefitted from the talents and educational systems of many nations. This constant renewal is largely responsible for the wealth and power of the US. In sum, the capacity of US science is directly related to its efficiency at integrating new talent and in its participation in the world-wide intellectual commerce.

Does this mean that we cannot develop native-born scientists? Have we arrived at the point in our national lives that we have to import scientists along with farm workers and day laborers?

The fact is that science has done a dismal job in nurturing and exploiting the talents of native-born minorities and women. And we've done little better in recruiting young people owing to a failing educational system. While recruitment in some of the natural sciences has increased the training of women–especially in biology and medicine, we have not cleared the obstructions preventing the elevation of the most senior and talented to positions of authority. Even if we succeeded in training more minorities and women as scientists, would that solve the problem?

No. We may be able to increase domestic recruitment by a few percent, but in the absence of an overhaul of the nation's education system, we could never hope to match the large numbers of scientists who come to this country to receive advanced education, do research and develop new ideas. Does this mean that we must engage in predatory recruitment of intellectuals and denude developing and re-developing countries of their talent, thereby diminishing their prospects for economic improvement?

No. We must fashion a world where global intellectual transactions–like monetary and commercial arrangements (at least as they now exist among the industrialized nations)–benefit all participants. We must have an international system where scientists may freely work with colleagues anywhere for the benefit of all.

Problems with visas

The process of acquiring visas is the valve regulating the flow of scientific talent into the US. In the past, the single most important hurdle to the granting of visas has been economic and the fear of illegal immigration as defined in various subsections of paragraph 214 of the Immigration and Naturalization Act. However, a complex array of provisions affixed to the INA has sought to reduce the flow of industrial and defense technologies to competitors by restricting scientific exchange. Many of these provisions require scientific and technical expertise to account for the fact that both our economic and defense technologies are dependent on foreign exchange—that to impede such information flow is to do injury to our own economy and security. The law and its administration do not have mechanisms or expertise to weigh risks in the national interest. The reasons are easy to enumerate:

·Consular officers in our embassies and consulates abroad usually do not have the background to judge scientific credentials or the value of a scientific visit. Scientists seeking entry to the US are treated in the same manner as all visitors—business, tourist or job applicant.

·There is ambiguity and confusion concerning the guidelines for enforcing provisions of the INA. Many US universities and national laboratories employ expert staff to deal with visa problems. But their interactions with consular officials are punctuated with inconsistencies in interpretation of regulations and law. And since consular officials are held accountable, it is safer and easier for them to deny an application than to examine the facts and to adjudicate on the basis of merit.

·The advent of the "sensitive countries list," (countries assumed to be engaged in activities counter to US interests) the "entities list," (the list of institutions deemed to have violated US non-proliferation statutes), export control regulations (to include such vague concepts as "deemed exports" and "sensitive but unclassified information") have given the Department of State an impossible task: to monitor and prevent the flow of scientific and technical information deemed critical to the economic and defense interests of the US. Not only do these contradictory and obscure provisions lead to delays and obstacles impeding scientific exchange, they often impose the ludicrous circumstance of impairing the exchange of information developed by foreign colleagues–information essential to the progress of science. The task of processing requests for entry visas often falls to an interagency task force which imposes an additional bureaucratic layer on the evaluation mechanism without adding any illumination.

These problems have created difficult conditions for our national labs. There has been an ongoing effort to convince foreign governments and institutions to make substantial investments in large programs. The US has then made it difficult for foreign colleagues to participate in on-site experiments because of restrictions in our visa laws which make no provision for open-ended scientific visits. The labs have often faced the ludicrous situation where a scholar representing a foreign university is denied admission to participate in an experiment funded by that university!

Among the more important factors contributing to the success of US science has been the recruitment of foreign graduate students. Large numbers of Chinese students have been a vital factor in invigorating physics programs around the nation. In recent months, however, visas have been routinely denied because these students are unable to demonstrate binding ties to their country. This means that they do not have an academic or research appointment in advance of their completion of graduate studies!

The international standard of free exchange

The International Council for Science is a global structure of disciplinary scientific unions such as the International Union of Pure and Applied Physics, Chemistry, Crystallography, etc. In the period between the world wars, before the advent of the International Council, adherence to many of the international disciplinary unions was vested in the Department of State. However, the system was wrested from government patronage and now resides with the Academies of Science in each member state. Thus, with the exception of China, Cuba and a number of authoritarian states, adherence to the international system is non-governmental. Nonetheless, each country must adhere to the international standard for the free circulation of scientists–something almost impossible to achieve when the government restricts entry to foreign scientists. Failure to adhere to this standard is grounds for the international union to withdraw sponsorship from a scientific meeting.

For international union-sponsored meetings in the US, the National Academy of Sciences usually communicates with the Bureau for Consular Affairs requesting that our consular officers abroad be apprized that an international meeting is being organized and requesting the Department to expedite visa applications regardless of origin. For the most part this system has worked well. However, there are increasing signs that this arrangement may be weakening.

Treasury and Commerce embargoes

US scientists are routinely denied permission by the Treasury Department to travel to Cuba unless an international meeting is organized by an entity to which the US is a member but which is not headquartered in the US. While social scientists, anthropologists, climatologists and some others have been able to travel to Cuba with increasing frequency, many physical scientists have been denied licenses on often inconsistent and contradictory grounds. The US community views such restrictions with grave concern since it directly affects the freedom of citizens to participate in important cultural exchange of benefit to both Cuba and the US.

Applications for license are often complex and time-consuming with little feedback after submission. Attempts to track the progress of applications are often rebuffed. Rarely do government employees respond to inquiries or provide meaningful information.

Remedial actions

Last year, in response to language added to the State Department appropriations bill, a Science and Technology Advisor was added to the staff. The position is currently held by a senior scientist who has the trust and confidence of the US scientific community: Dr. Norman Neureiter. It is urgent that this office be strengthened and be given the opportunity to coordinate issues affecting entry of scientists into the US.

It is proposed that short and long-term scientific visas be processed under a new category of visa and that the Department S&T advisor work with both the Office of Science and Technology Cooperation in the Bureau of Oceans and International Environmental and Scientific Affairs, and the Bureau of Consular Affairs, to administer a coherent, effective policy to promote scientific exchange.

It is also proposed that the State S&T Advisor assist the Treasury and Commerce departments in dealing with visits of US scientists to embargoed countries.

US science has maintained its international leadership by promoting scientific exchange. The unprecedented flow of

intellectual talent into our country has continued unabated over the past half-century. This represents a huge contribution to both our domestic science enterprise and to our economy since innovations in science and technology have been shown to have a direct impact on our commercial expansion and development. In addition, some of the most important international scientific meetings are convened in the US and foreign participation in these events contributes to the centrality of US science on the world stage. However, impediments to the granting of visas have burgeoned. Scientist visits have been curtailed and this has jeopardized a variety of programs dependent upon short and long-term visits. Scientists from the former Soviet Union, China, India and many developing countries have found it increasingly difficult to gain entry to the US to continue their research and collaboration with US colleagues. Even scientists from traditional allies such as Germany have been barred for reasons that defy explanation. If this situation continues to worsen, the center of gravity for important research may shift away from the US.

In their 1999 report, ***The New Challenge to America's Prosperity: Findings from the Innovation Index***, the Council on Competitiveness issued a warning.

Finally, the authors note that despite the advances of other nations, the United States is failing to invest in the "fundamentals" of its own innovation system. Although the past decade has been one of the strongest periods of U.S. macroeconomic growth since World War II, total spending on basic research is flat or heading downward, and the declining numbers of degrees granted in the physical sciences and engineering suggest that reversing this trend will involve concerted public policy changes. These observations suggest that America's current innovation leadership is increasingly rooted in past investment and that the long run basis for our future strength is being eroded—all while other nations are accelerating their own efforts.

FIP Acts on Proposed APS Landmine Study

James Vary, Professor of Physics, Iowa State University

Andy Sessler, past President of the APS, attended FIP's April meeting in Albuquerque and presented a proposal for an APS Landmine Study. The proposal is co-authored by Surajit Sen of SUNY-Buffalo.

The APS has a history of conducting independent studies of issues that overlap physics, technology and policy. For example, the APS is now conducting a study of the feasibility of intercepting ballistic missiles during their powered launch phase. This study is nearing completion.

The advice and consent of various APS units is a significant factor in the APS decision to conduct such studies and FIP weighed in by passing a motion urging the APS to accept the Landmine Study proposal. The FIP motion reads: "Given the terrible humanitarian toll taken by landmines around the world, FIP strongly supports the proposed APS Landmine Study." The motion was presented at the APS Committee on International Scientific Activities (CISA) meeting the following day in Albuquerque. As CISA proposes policy action items to the APS Executive Board, their support of the Landmine Study is also crucial to further APS action. CISA also endorsed the proposal.

A succinct overview of this 18-page proposal for an APS Landmine Study is provided in its executive summary.

Executive Summary

The US General Accounting Office (GAO) estimates that some 127 million landmines, the deadly detritus of past and ongoing wars, claim the lives and limbs of some 20,000 men, women and children each year in 55 (the UN claims 64 and International Campaign to Ban Landmines claims 88) countries. There is a critical need to detect, disarm and remove these deadly devices.

Current humanitarian de-mining programs require risky, manpower-intensive techniques costing as much as $1,000 to remove a $3 mine. With global budgets of less than $100 million per year allocated for manual detection and removal of mines for humanitarian de-mining purposes, it will require hundreds of years, perhaps millennia, to clear the present compliment of landmines. Most poor countries have budgets of less than $2 million/year for mine clearance. Thus, there is an urgent need for the development of new technologies that would allow essentially 100 percent mine clearance, at reasonable speeds, for all soil types, and with the lowest possible explosive contamination to the soil. Further, all this must be accomplished at an affordable price.

The GAO reports that the US has spent $160 million over a three year period and an additional $47 million for R&D on detection and removal of buried explosives. New and more reliable technologies or significant improvements to the existing technologies, are needed to speed detection and disarming. Of particular concern is the absence of reliable technologies to detect plastic anti-personnel mines. The GAO report lists 19 technologies that have been considered for de-mining. Of these, 17 are based upon physics. The scientific and technical dimensions of the problem are immense, including: electromagnetic signatures, infrared, millimeter waves, conductivity/resistivity, quadrupole resonance, X-ray flourescence, acoustic sensing, and neutron activation.

It is expected that the Report will help funding agencies, especially those having little technical capability, to better decide upon which technologies to support for research, design and development. To that end, the study will review the contributions of the Department of Defense and the engineering communities, and then focus upon the area of long-term R&D beyond the horizon of private companies, but yet vital to the development of the much-needed new technologies for humanitarian de-mining. It is also expected that the study will stimulate the involvement of the community of physicists in the development of and evaluation of new technologies based that are yet to be incorporated into existing programs.

The proposed study will respond to the following charge:

Assessing the parameters in humanitarian de-mining by providing:

… A survey of the latest mine types, trip-wire alignments, mine placement characteristics (in collaboration with experts from the Departments of State, Defense, The Halo Trust, MECHEM (South Africa), MGM (Germany), the United Nations and other agencies).
… A survey of soil types by sand, clay, water, etc. content in mine infested regions in collaboration with soil scientists.

Evaluation of the available technologies and of technologies under development by providing:

… An evaluation of the various methods now employed in de-mining.
… An estimate, employing the existing technologies, and as functions of soil conditions and terrain morphology, of the achievable speed at which humanitarian de-mining is possible.
… Evaluations of the various physical methods that are, or can potentially be, appropriate for de-mining.
… Delineation of the R&D required, for each of the identified physical methods, to bring them to the point of possible value.
… Estimates of the phase, subsequent to the R&D phase, that will be required to bring into practice new and innovative technologies. This will include development time and costs.
… Estimates of the achievable speed at which humanitarian de-mining may be possible as functions of soil conditions and terrain morphology based upon the new technologies.

The anticipated study will be carried out by a Panel of physicists and engineers who are able to cover the various physical phenomena and, consequently, address the above items. They will hear presentations from experts on the technical, administrative, and military aspects of the humanitarian de-mining efforts, and from social and political scientists with expertise in studying the economic and social issues associated with restoring the socio-economic infrastructure of mine infested nations. However, the primary emphasis will be upon the physics of de-mining. To that end, the Panel will hear presentations from those involved in technology, both at the DOD and in private companies.

It is anticipated that the study will extend over one year, that the Panel will consist of ten physicists and engineers, and that there will be two one-week study periods and five two-day meetings. The cost of the study will be 275 k$ and this funding will be sought from various foundations.

Latin American School of Physics

Provided by Marcelo Alonso, Florida Tech

ELAF is an informal organization whose purpose is to offer advanced students of physics from Latin America the opportunity to get acquainted with modern frontier subjects in Physics, presented by recognized leaders in the field. ELAF is also open to students from US and other countries. The duration is between two to four weeks. ELAF is rotated among different countries, and each one is organized by an ad hoc Committee. The idea of ELAF emerged in Mexico in 1956, at a summer school, organized by Marcos Moshinsky, the second in 1960 was in Brazil, organized by Jose Leite Lopes, and the third in 1961 in Argentina, organized by Juan Jose Giambiagi. Since then the ELAF has been held not only in those three countries but also in Venezuela, Peru and Chile, although every third year it has been held regularly in Mexico. The 2002 ELAF was held in Peru, with the participation of about 60 students, most of them from the Andean countries. The 2003 ELAF will be held in Colombia and the 2004 ELAF will be held again in Mexico.

ELAF is supported by local institutions as well as by UNESCO and ICTP. Since the establishment in 1962 of the Latin American Center of Physics (CLAF), located at the Brazilian Center for Physics Research (CBPF) in Rio de Janeiro, CLAF has served as an umbrella for the organization of each ELAF. Those interested in 2003 ELAF should contact Prof. Luis Masperi, director of CLAF, at masperi@cbpf.br (also at masperi@cbpfsu1.cat.cbpf.br or claf@thorium.cat.cbpf.br) or the organizer, Dr. Thomas Dittrich (National University, Bogota, Colombia) at dittrich@ciencias.unal.edu.co

International Workshop on WMDs

The first International Workshop on Radiological Sciences and Applications (IWRSA) will be held in Albuquerque, NM from June 16 to June 18, 2003. The theme of this workshop is "Issues and Challenges of Weapons of Mass Destruction (WMD) Proliferation". The main goal of the meeting is to identify the grand challenges and needs within the international community where radiological sciences and technologies can make a positive contribution. The workshop is an informal forum for scholarly discussion of important issues and to promote international cooperative projects in radiological sciences and technologies. For additional information please visit the workshop's web site at http://www.iwrsa.org.

The 2002 Sponsored Fellows

Barrera, Ruben Gerardo
UNAM, Mexico
For his significant contributions to the understanding of the optical properties of surfaces and inhomogeneous media as well as for his leadership in the establishment and improvement of relations among physicists in the Americas, e.g., helping to create the Latin American Federation of Physics Societies.

Baruch, Pierre
Universite Paris 7 - Denis Diderot
For his theoretical studies on energy conversion and the thermodynamical description of photovoltaic cell operation as well as for his numerous actions in support of international scientific cooperation, e.g., through the Organization for Economic Cooperation and Development and its Megascience Forum.

Bingham, Robert
Rutherford Appleton Laboratory
For his original and creative approaches to applying plasma physics to a diverse range of problems in laser-plasma interactions, space, and astro-plasma physics, and for his extensive activities in support of international physics, e.g., collaborations and summer schools.

Goldhirsh, Isaac
Tel-Aviv University
For seminal contributions in the field of granular fluids and fundamental contributions in magnetism, solid-state physics, dynamical systems and hyrdodynamics, and for his extensive activities in support of international collaborations.

Kuyucak, Serdar
Australian National University
For codevelopment of the I/N boson expansion technique for describing the properties of medium - to heavy- mass nuclei and for its extensions to high-spin states and subbarrier fusion as well as for his significant contributions to the promotion of international collaborations and exchanges between Australia and the United States and for the organization of international conferences and schools.

Lewis, Brenton Raymond
Australian National University
For his seminal studies of the electronic structure of atmospheric molecules, particularly O2, through high-resolution vacuum ultraviolet spectroscopy and couple-channel calculations as well as for his major international effort to organize global effort to investigate this problem.

Ren, Shang-Fen
Illinois State University
For her contributions to theoretical understanding of low-dimensional semiconductor systems, especially the vibrational properties in semiconductor superlattices, quantum wires, and quantum dots as well as for her many contributions promoting international scientific collaborations, such as through the National Science Foundation's Research Experience for Undergraduates program with East Asia.

Skukla, Padma Kant
For theoretical investigations of an enormous variety of plasma phenomena in laboratory and space plasmas, including the prediction and exploration of waves in dusty plasmas, and for his extensive activities in support of international collaborations.

Tosatti, Erio
International School for Advanced Studies, Trieste, Italy
For his seminal contributions to the theory of solids, such as, the faceting, reconstruction, preroughening and melting of surfaces, and the multi-shell helical structure of gold nanowires, while also serving as a scientific leader in fostering international ties via worldwide collaborations and the organization of conferences.

Vergados, John D.
University of Ioannina
For his important contributions to double beta decay and symmetries in weak interactions as well as for his strong support and development of international collaborations between Greece and other countries.

Kennedy Reed: 2003 John Wheatley Award

"For multifaceted contributions to the promotion of physics research and education in Africa, for developing agreements for exchange of faculty and students between American and African institutions, for organizing and conducting international workshops and conferences on physics in Africa, and for advocating increased American and international involvement with physics in Africa."

The 2003 John Wheatley Award went to Kennedy Reed. Reed earned a B.S. at Monmouth College in Illinois, and a Ph.D. in physics at University of Nebraska. A theoretical physicist at Lawrence Livermore National Laboratory, he has over 100 publications, and has contributed to the understanding of indirect processes in electron-impact excitation and ionization of highly charged ions. He is also director of the LLNL Research Collaborations Program for HBCUs & MIs, within the Laboratory's University Relations Program.

Dr. Reed is a Fellow of the American Physical Society; Charter Fellow, National Society of Black Physicists (NSBP); member, Optical Society of America; and member, American Association for the Advancement of Science.

A leader in national efforts to increase minority participation in physics, Dr. Reed has been President of NSBP; Chair, APS Bouchet Prize Committee; member, APS Committee on Minorities in Physics; a co-founder of the National Physical Science Consortium Graduate Fellowship Program; and a Professor at Morehouse College.

Excerpted from www.aps.org.

More Than Three Quarters of All Manuscripts Submitted to Physical Review A Originate from Abroad!

FIP members may be interested in noting the increasingly international character of Physical Review. In 2000, non-US manuscript submissions to Physical Review A increased to 1,712 (from 1,579 in 1999); the US share dropped from 26.8% in 1999 to 24.6% in 2000. This year, submissions are up 8% and the trend is continuing; the trends are similar for the other Physical Reviews.

In 2000, Physical Review A published 1,395 articles (up 4.4% over the previous year) on 10,698 pages (up 7.6%). The growth continues despite tougher acceptance standards: the rejection rate in our journal was 32.7% in 1999, 35.2% in 2000, and is 50.3% in January-June, 2001 (this is a preliminary number).

Increasing use of electronic communications in the editorial and production processes and hard work by the staff have led to a reduction of the median interval from receipt of a manuscript to acceptance from 105 calendar days in 1999 to 80 days at present (for articles and Brief Reports).

Editors always are eager to receive comments (good or bad) from their constituents!

Bernd Crasemann, Editor, Physical Review A

FIP Membership

FIP Travel Grants provide partial travel support for a physicist working in the U.S. who is a member of the American Physical Society to give a presentation at an international conference

Wheatly Award honors and recognizes the dedication of physicists who have made outstanding contributions to the development of physics in countries of the third world, by working with local physicists in research or teaching.

Fellowship nominations can be made through FIP.

Journal/Book Exchange allows for the donation of books and journals to other countries.

How to Become a Member

To become a member of the Forum on International Physics sign up on the web at:

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Requests for membership can be emailed to:

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or by contacting Trish Lettieri at:

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