



March 2011 Newsletter

Ernie Malamud, Editor

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Disclaimer—The articles and opinion pieces found in this issue of the APS Forum on International Physics Newsletter are not peer refereed and represent solely the views of the authors and not necessarily the views of the APS.

View from the Chair

Harvey Newman

Welcome to this first issue of the 2011 FIP newsletter, and to our new Editor, Ernie Malamud. We look forward to a very proactive year on the international physics front, reflected in the informative and in some cases provocative articles in this and future issues.

The inherently international character of science and the importance of unrestricted collaboration, communication and travel are recognized throughout the APS, and are embodied in the fact that nearly a third of the APS members reside outside the U.S. It is a tradition of FIP, notably established by past Chairs Lerch, Winick, Ozaki, and Koller, to strongly engage in international issues, and to promote and defend science in the international arena, as well as open communication and equal access to information and education, diversity, gender equality, and the freedoms and basic human rights that make global scientific progress possible.

APS President Barry Barish has emphasized the importance of international issues, and the APS leadership has moved rapidly to better serve its membership with a global perspective: by expanding the number of International Councillors and moving to increase international representation on APS Committees, and by starting Physical Review X (<http://prx.aps.org>), a global online open-access journal covering all of physics. FIP and the Committee on International Scientific Affairs (CISA) chaired by Karsten Heeger, have begun work on making APS meetings more accessible to its global membership through electronic communication techniques.



We on the FIP Executive Committee look forward to working with the FIP membership, the Office of International Affairs (OIA) led by Amy Flatten, CISA and the APS leadership, to build on FIP's traditions, work to strengthen the engagement with the APS' international membership, and help make the initiatives mentioned above a success.

New Slate of FIP Officers

A new slate of officers was installed in January, with the chair line moving one step forward. I welcome the new members of the Executive Committee: Sergio Ulloa (Vice-Chair), Physics and Astronomy, Ohio University; Carl Akerlof, Department of Physics, University of Michigan at Ann Arbor; and Eugene Chudnovsky, Department of Physics and Astronomy, CUNY-Lehman College. Ulloa's 4-year term and Akerlof and Chudnovsky's 3-year terms began Jan. 1, 2011.

I take this opportunity to thank Noemie Koller, now our Past Chair, for her dedicated leadership and guidance

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Carl Akerlof



Eugene Chudnovsky



Sergio Ulloa

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throughout the last year, as well as her sensitive handling of a number of difficult international issues that arose. I'd also like to congratulate her on winning the Nicholson Medal, for her career-long commitment to mentoring and fostering the careers of young physicists, and for her leadership as a scientist and humanitarian promoting international freedom and gender equality (see article on page 14).

FIP is very fortunate indeed to have Noemi Mirkin, Biophysics Department at the University of Michigan, who continues to serve as Secretary/Treasurer. We are highly indebted to Noemi for her many years of service in managing the Forum's finances and the many aspects of its business matters.

Herman Winick, our FIP Councillor (and FIP Chair in 2007), continues to provide dynamic leadership on a range of international issues, including human rights, and to provide guidance, advice and creative ideas on ways to improve on FIP's service to the international science community.

FIP Activities in 2011

One of the major undertakings of FIP is the organization of sessions at the March and April meetings. This year we have very interesting and informative invited sessions on a wide-ranging set of issues. These are described in accompanying articles in this newsletter.

We welcome and congratulate the new APS Fellows (see page 13) and congratulate them on their achievements in physics, as well as their dedication and leadership to science education and outreach, promoting international collaborations, and human rights advocacy. We will present their certificates at the meeting they attend, either in March or April.

I would also like to thank Vasudevan Lakshminarayanan for his leadership of CISA, in which the FIP chair line is active, through 2010.

There are several important and prestigious APS prizes, awards, medal and lectureships with which FIP is closely associated. I encourage FIP members to nominate truly outstanding colleagues and thus recognize their contributions to our field.

- The Andrei Sakharov Prize. Nominations for the 2012 prize are due July 1, 2011. Details are at <http://www.aps.org/programs/honors/prizes/sakharov.cfm>
- The John Wheatley Award. The award is presented

biennially, every odd-numbered year, at the general meeting of the American Physical Society. See <http://www.aps.org/programs/honors/awards/wheatley.cfm> for details on nominations for the 2013 award.

- International Travel Grant Awards. Members of FIP, as one of the sponsoring APS units are eligible to apply. See <http://www.aps.org/units/fip/newsletters/201009/irwin.cfm>
- The Nicholson Medal. The deadline for submission of nominations for the 2011 prize is July 1, 2011.
- The Society continued to bring international physicists to speak at APS meetings through both the Marshak and Beller Lectureship Awards. The Marshak Lectureship, endowed by Ruth Marshak in honor of her late husband and former APS president, Robert Marshak, is to provide travel support for physicists from "developing nations or the Eastern Bloc". <http://www.aps.org/programs/international/programs/marshak.cfm> In 2010, the Marshak Awardee represented the Palestinian Authority. The Beller Lectureship <http://www.aps.org/programs/international/programs/beller.cfm> was endowed by Esther Hoffman Beller for the purpose of bringing distinguished physicists from abroad as invited speakers at APS meetings. In 2010 the Beller Awards were presented to physicists representing Israel and France.

Andrei Sakharov Prize

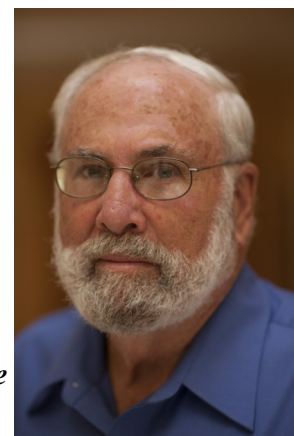
The Sakharov Prize recognizes outstanding leadership and/or achievements of scientists in upholding human rights. The prize is named in recognition of the courageous and effective work of Andrei Sakharov on behalf of human rights, to the detriment of his own scientific career and despite the loss of his own personal freedom. The Prize is endowed by contributions from friends of Andrei Sakharov. The 2010 prize was awarded to Herman Winick, Joseph Birman and Morris Pripstein.

FIP is very pleased and honored that one of the awardees of this prize is FIP Councillor Herman Winick.

The award citation

<http://www.aps.org/programs/honors/prizes/prizerecipient.cfm?name=Herman%20Winick&year=2010> reads:

“For tireless and effective personal leadership in defense of human rights of scientists throughout the world.”



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John Wheatley Award

The 2011 Wheatley Award, to honor and recognize the dedication of physicists who have made contributions to physics in the Third World, has been awarded to Miguel Jose Yacaman of the University of Texas, Austin. Professor Yacaman will receive his award at the prize session at the April meeting.



The award citation,

<http://www.aps.org/units/fip/awards/recipient.cfm?name=Miguel%20Jose%20Yacaman&year=2011> reads

“For the great impact that his efforts as an influential promoter of the development of physics have had, not only in Mexico, but also in Latin America and beyond.”

The John Wheatley Award was established in 1991 with the support of the Forum on International Physics to honor and recognize the dedication of physicists who have made contributions to the development of physics in countries of the third world.

The award consists of a stipend of \$2,000 and a certificate citing the contributions made by the recipient.

Overseas Physics Groups

In its work on international issues, FIP welcomes its continuing partnership, begun in 2006 under then-FIP Chair Irving Lerch, with several overseas physics groups, including:

- American Chapter of the Indian Physics Association (ACIPA), India; Surajit Sen, President. <http://www.physics.buffalo.edu/~sen/ACIPA.htm>
- Association of Korean Physicists in America (AKPA), Korea; Ho Jung Paik. <http://www.akpa.org/>
- Overseas Chinese Physics Association (OCPA), China; Bill Weng, President. <http://www.ocpaweb.org/>
- Iranian-American Physicists (IrAP) Network Group; Hamid Javadi (JPL). <http://irapnet.org/>

Promoting and Defending International Science and Human Rights

International physics collaborations, whether one-on-one, among small groups, or as part of major science projects such as SESAME and the Large Hadron Collider program, are shining all-too-rare examples of cooperation across borders that promote not only the progress of science, but mutual understanding and world peace. Recent challenges to international cooperation and violations of human rights continue. One of the most shocking recent examples is the assassination of Iranian physicists working on SESAME during the past year: nuclear physicist Majid Shahriari last November, and string theorist Massoud Ali-Mohammadi (a member of the SESAME Council from Iran) in January 2010.

Other recent events violations include the house arrest of the wife of Nobel Peace Prize winner Liu Xiaobo and many other dissidents in China since October, the house arrest of Nobel Peace Prize winner and opposition leader ElBaradei and the shutting down of the Internet to stifle communications during the unrest in Egypt, at the time of this writing.

FIP will continue to work together with Amy Flatten and Michele Irwin of the Office of International Affairs and the APS leadership to inform our members of these issues, and to raise awareness whenever violations occur. Building on its traditions, FIP will continue to work as needed to uphold the principles of open communication and cooperation without borders, to promote equality of access globally to the knowledge of physics, and to defend human rights both within and beyond the bounds of the scientific community.

Harvey Newman (newman@hep.caltech.edu) is a Professor at Caltech, a high-energy physics experimentalist and Chair of the FIP. He is also engaged in work on Digital Divide issues in many regions of the world. During 2010, as FIP Chair-Elect and FIP Program Chair he organized the FIP sessions for the APS Spring 2011 meetings.

American Physical Society Office of International Affairs *Amy Flatten*

2010 was a dynamic year for the Society's international programs. While a new year naturally brings enthusiasm for new opportunities ahead, I would like to take a moment to reflect on the important developments from 2010, as many of these simply wouldn't have been possible without the support of the Forum on International Physics (FIP).



Most APS members would agree that physics is "international" in nature, but many may not have realized the large number of APS members that are based outside the United States—nearly 25% of our members (excluding students). During 2010, the Society undertook several new efforts to better serve APS members living beyond U.S. borders. By establishing the International Friends network, key contacts across the world will serve as the Society's "ambassadors" at their institutions, helping to plan APS activities and communicate with members in their local communities. Moreover, the International Friends are regarded as advisors—a source for advice and insight from our international members as we endeavor to expand our international activities.

The International Friends program is just one small step in a larger effort by APS to expand the Society's overall international engagement. Along with establishing the International Friends network, the Society proposed an amendment to the APS Constitution to enable more international representation on the APS Council, the main governing body of the APS. The amendment proposed to increase the number of International Councillors from one (our current number)—to a total of four. The APS membership overwhelmingly passed the amendment and the four International Councillor positions will be phased in over the next four years. By increasing the number of International Councillors, who will each serve a four-year term, the Society will better ensure that the interests of the international members are brought into the Society's deliberations. The Councillors will collaborate with the International Friends network to bring important concerns and issues of the international community to the APS governance.

This past year, the APS partnered with other national physics societies toward a number of new initiatives. We signed a Memorandum of Understanding with the Sociedade Brasileira de Física (SBF) toward a new exchange program for physics graduate students and professors. Through the **Brazil-U.S. Physics Student Visitation Program**, graduate students can apply for travel funds to pursue a breadth of opportunities in physics, such as attending a short-course or summer institute; visiting with a professor in his/her field of study; working temporarily in a lab; or any other opportunity that the student and professor feel is worthy of travel support. **The Brazil-U.S. Professorship/Lectureship Program** funds physicists in Brazil and the U.S. wishing to visit overseas to teach a short course or deliver a lecture series in the other country.

The Society continues to partner with the Indo-US Science and Technology Forum (IUSSTF) toward exchanges of graduate students and professors between the United States and India. This ongoing program funds physicists' visits overseas to teach short courses or provide a "physics lecture series" at U.S. and Indian universities. The student visitation program not only enables U.S. students to conduct research in India's laboratories, but provides first-hand experience with Indian science, culture, and fosters opportunities for developing long-term collaboration.

APS underscored its ongoing commitment to physics colleagues throughout the developing world through several programs. The Society enabled collaborative research between APS members and developing country physicists through its International Travel Grant Award Program (ITGAP). Twice this past year, the Society invited members of participating APS units to submit proposals for this expanding program. Originally launched by FIP, the ITGAP is ever growing through support from sources even beyond APS. In 2010, six awardees received travel awards to visit an international collaborator.

In partnership with the UK Institute of Physics (IoP) and the International Centre for Theoretical Physics (ICTP), the Society co-sponsored a workshop designed for physicists and engineers from developing countries who are interested in learning entrepreneurial skills to commercialize their scientific inventions. The workshop was held at ICTP in Trieste, Italy, and included

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approximately 60 participants. Such an educational program is missing in many of the developing countries for scientists working in universities and scientific institutions. The objectives of the workshop were to introduce scientists and engineers to the process of innovation, generation and protection of intellectual property, technology transfer and product commercialization.

The Society continued to bring international physicists to speak at APS meetings through both the Marshak and Beller Lectureship Awards, which support distinguished physicists from the developed and developing countries respectively. In 2010, the Marshak Awardee represented the Palestinian Authority, and the Beller Awards were presented to physicists representing Israel and France.

The APS also supported physicists in the Middle East through the SESAME project, the construction in Amman, Jordan of a major international research center with a synchrotron light source. By enabling physicists from Middle Eastern and neighboring countries to avail themselves of training opportunities, the APS and other partnering societies are building a "user community" in the region. To support this, the Society had established the SESAME Travel Award Program in partnership with the European Physical Society (EPS), the UK Institute of Physics (IoP), and the German Physical Society

(DPG). Just this past year, the American Chemical Society joined the program, expanding the available travel for Middle Eastern physicists.

Throughout the past year, the APS continued its vigilance regarding important U.S. Government policies that impact international scientific collaboration. This year, APS joined other scientific and higher education organizations to meet with State Department officials regarding new developments in visa processing. The APS will continue to work with federal leaders to ensure national security concerns do not unduly restrict scientific research with international colleagues.

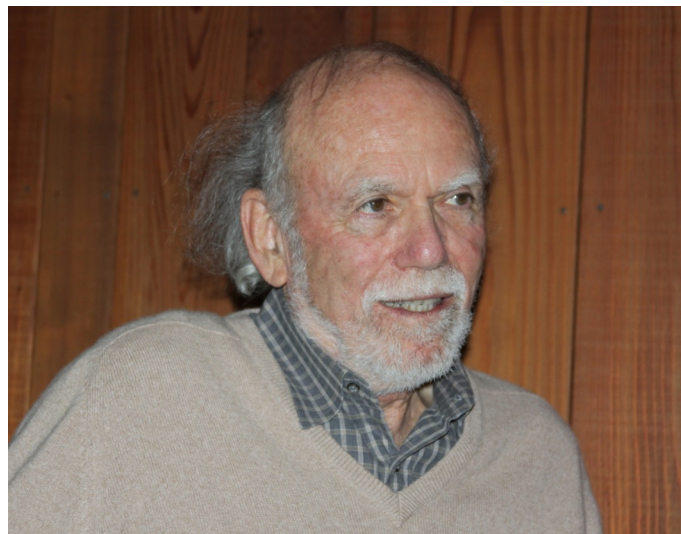
The APS joined with other organizations in the AAAS Science and Human Rights Coalition--a network of professional societies providing strengthened connections between the human rights and scientific communities. Through this Coalition, and through the efforts of its volunteers, the APS advocated for the human rights of scientists in the U.S. and around the world and responded to calls to assist those scientists in need.

Dr. Amy Flatten is Director of International Affairs at the American Physical Society.

Serving our international membership *Barry C Barish*

The APS has a very diverse membership. In fact, we have nearly 29% student members and of the non-student membership, 25% reside outside of the U.S. Of course, what we have in common is that we identify ourselves as physicists or with physics, even though some of us are in academia and others in industry; some are beginning their careers and others are near or in retirement; some are born and live in the U.S., while others reside outside the U.S. As the demography of our membership evolves, it is incumbent on us as a society to continually evolve ourselves, such that we best serve our membership.

In this article, I focus specifically on how well we are serving our growing constituency of members who live outside the U.S., and discuss ways in which we might be able to serve this group better. Let me state from the outset that there has not been a barrage of complaints from members or potential members who reside outside the U.S., so my remarks here come from our growing awareness of the globalization of science and

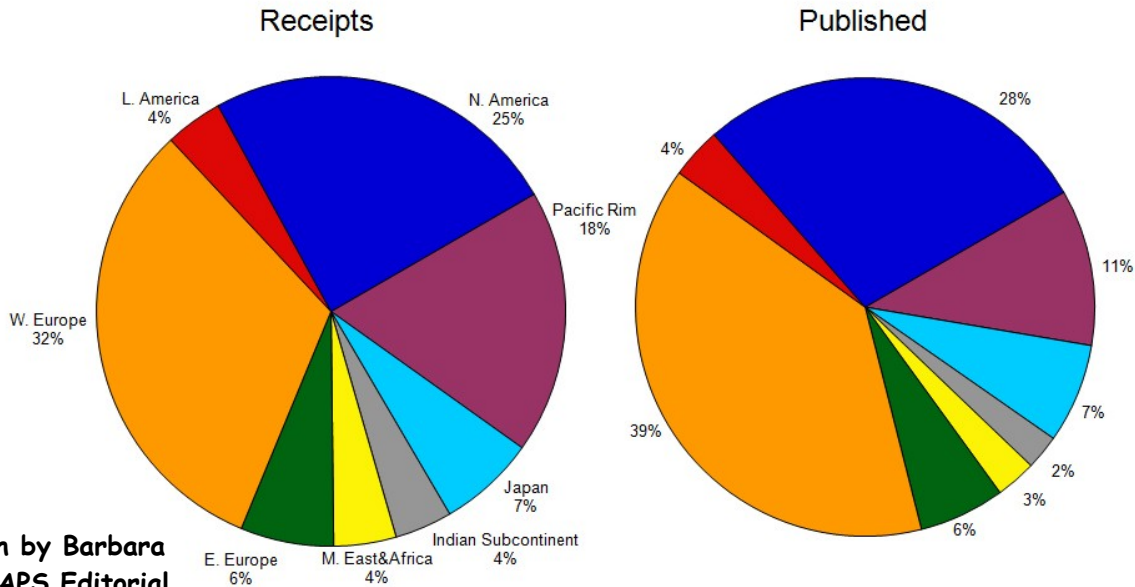


the importance that the APS adapt itself to that changing landscape.

Several years ago, APS President Cherry Murray asked

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Physical Review and Physical Review Letters January 1 – December 31, 2010



Graph by Barbara Gill, APS Editorial Office, 2/03/11

Geographic distribution of submitted and published papers in APS journals

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CISA to find out how we could better serve our non-U.S. members. One of CISA’s suggestions was to expand the number of non-U.S. representatives on the APS Council. We are very encouraged that we received overwhelming support from the APS membership for this change, even though this increase was done without increasing the total number of APS Councilors. The resulting increase in non-U.S. resident Council members immediately gives a stronger voice to our non US members at the governing and policy making level of the society.

This is a very good step, but we can easily see how far we have to go by simply looking at how well non-U.S. members are represented on APS Committees and Unit leadership. In fact, the answer is, not very well! Excluding CISA and CIFS (our “International” Committees), none of the other 19 APS committees have a single member living outside the U.S. We are not doing much better for Division, Forum and Topical Group Executive Committees, where we just have a small smattering of members who live outside the U.S.

It seems clear that we can and should do better! I believe that by making pro-active efforts, we can make

significant progress toward bringing APS members living outside the U.S. onto our committees. The practical problem of travel limitations can be significantly alleviated by our aggressively employing modern telecommunications technology.

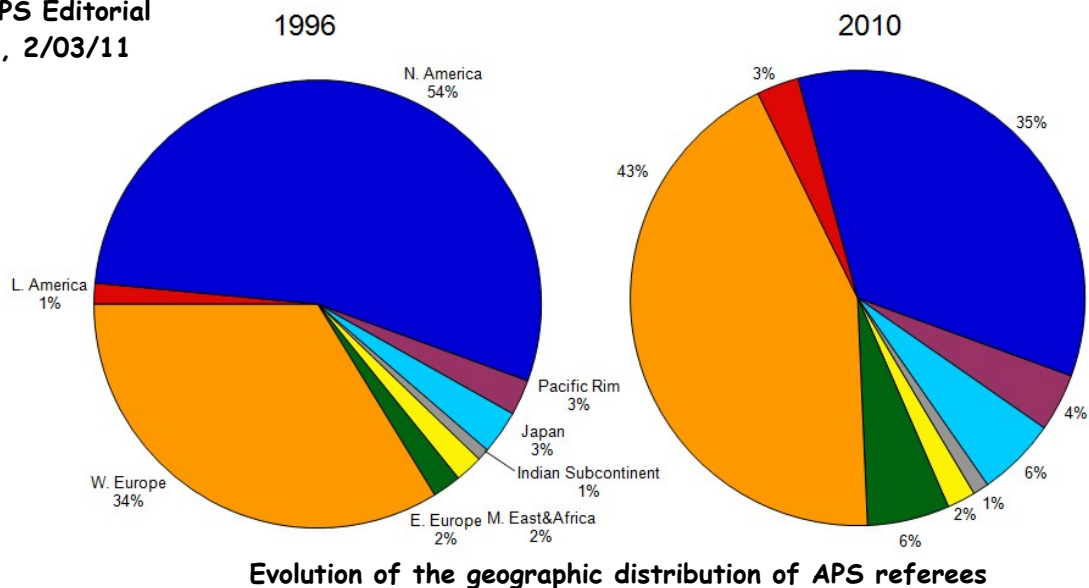
The largest and most important functions of the APS are our programs that enable scientific communication for members both through the organization of professional meetings and the publishing of scholarly research papers. In both cases, we need to ask how well we are serving our non-U.S./ resident members. Although we have no bias restricting non-U.S./ members from participating and presenting papers at our professional meeting, travel considerations present a substantial obstacle. In this case, we can take immediate steps to help mitigate this problem by making the presentations more accessible, again through the use of modern communication tools. In this regard, we are presently working toward a pilot project to post talks on the web, so that they can be accessed around the world, once they are presented at the meetings.

Posting talks on the web is broadly practiced for international physics conferences, making it straight for-

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Physical Review and Physical Review Letters Referees Used for Published Articles

Graph by Barbara
Gill, APS Editorial
Office, 2/03/11



Evolution of the geographic distribution of APS referees

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ward for us to adopt an in-use system. The cost of posting talks is not large, especially if the speakers upload their own talks. Of course, we may eventually want to go a step further and consider live video feeds for plenary talks, and that is certainly a future possibility. In my opinion, we will have already gone a long way toward making our meetings more internationally accessible by simply posting the talks. It also seems clear to me that this will add to the impact and importance of our scientific meetings and I doubt very much that it will reduce attendance. (There is no indication that attendance at International Conferences where talks are posted has been adversely affected).

Scientific publishing is our largest and most complicated endeavor and I can hardly discuss all the issues here. But, the APS has done a lot in the publishing area to reflect the growing global nature of the authors and readership of our journals. It is sobering to realize that 73% of our published articles in Physical Review and Physical Review Letters come from outside the U.S. Considering that, I find it truly impressive how well we have done at recognizing these facts and reflecting them in our publishing policies and procedures. For example, the fraction of published vs. submitted papers do not show any dramatic geographic differences, although

Asia is a bit lower than the Americas or Europe. We can also conclude that our publication procedures have followed the global diversification of our published articles by noting that the number of U.S. referees has dropped from 1996 to 2006 from 54% to 38%. Also, I might add that our finances also track the demographics, as 70% of our publishing revenues come from outside of the U.S., again reflecting where articles originate.

As we move into the future, we will need to be vigilant and very forward looking, as publishing is in a period of change. Electronic publishing has already become the dominant means of delivery of our journals, enhancing the global reach. We are now entering a new era of open access journals, where there are presently many different approaches being discussed or implemented. Regarding APS publishing, we are working hard to develop the model that will work best for us. Of course, the first criteria is to maintain the high quality of our journals, but also to maintain fully international policies and develop a sustainable business model.

I should at least mention that there are other very important international areas that concern the APS. For example, the globalization of science research and the emergence of large international collaborations and

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building and operating international facilities present many opportunities, as well as new problems. The APS, as a voice of the American physics community, can help communicate the value of these international research opportunities to our government, and to also work internationally to assure that these facilities are implemented such that they are available to physicists worldwide and as free of politics as possible.

Finally, I would like to close by recognizing one other international area where the APS is active and can make a difference. Emerging countries are rapidly developing an increasingly educated scientific community, but typically have little tradition or local organizations that provide the type of home for their professional physicists that are provided by the APS. We are investigating possible partnerships in such countries, in order to both build relationships and help them develop their own equivalents of the APS.

Although I have concentrated on areas of internationalizing the APS activities in this article, I should emphasize that we fully intend to remain a society for Ameri-

can physicists, but having increased benefits, policies and representation from our non-U.S. members.

Most of the issues I have raised here do not represent one year problems and I don't want to leave you with the impression that I want to drastically change and internationalize the APS. Instead, I see the APS making stepwise changes to better include our international membership, while preserving the functions that the APS plays for American physicists and physics. Over a period of several years, I believe we can both maintain these core responsibilities, while evolving ourselves to better serve our growing international constituency

I have given a number of my ideas and plans for strengthening the international programs of the APS in this article, but at the same time, I am interested in hearing your reactions and ideas.

Barry Barish is the Linde Professor of Physics Emeritus at Caltech and APS President.

From the Editor

Ernie Malamud

The Executive Committee of the Forum on International Physics elected me to a 3-year term as FIP Newsletter Editor. My job is to produce two newsletters per year. I have set the deadlines for receipt of materials as February 1 for the Spring Issue, in time to have some printed copies available at the Spring APS meetings, and August 1 for the Fall issue. The success of this endeavor depends on you, the members of FIP, who I encourage to send suggestions for topics and authors which I can then follow up. Please send your ideas and contributions to me at malamud@foothill.net. I'm also happy to hear your ideas by phone.

A definition of **forum** is "a medium of open discussion or voicing of ideas." Thus, I encourage (short) letters to the editor commenting on FIP newsletter articles or other ongoing events of interest to our membership.

Also as specified in the by-laws I have appointed a small Newsletter Committee to help me with author and topic suggestions. Members are Bill Barletta (MIT and UCLA), Amy Flatten (APS), Efim Gluskin (Argonne), Marleigh Sheaff (University of Wisconsin), and Lidia Smentek (Vanderbilt University). This issue has benefited from their input and I thank them for it.

I am very pleased to see contributions from so many different parts of the globe.

Ernie Malamud after three decades of work at Fermilab on high energy physics experiments and accelerator construction retired to live in California. He is currently on the adjunct faculty at the University of Nevada, Reno.

FIP Sessions at the APS March meeting *Harvey Newman*

There will be four invited paper sessions and one contributed paper session sponsored or co-sponsored by FIP. All of the invited sessions will take place in Ballroom C4 in the Dallas Convention Center. The contributed paper session V24 is in room D167. The meeting runs from Monday March 21 through March 25.

Critical Materials for Global Science and Technology B8. MONDAY, MARCH 21, 2011, 11:15 AM - 2:15 PM Chair: William Barletta, U.S. Particle Accelerator School, MIT and UCLA

“Critical Materials for Global Science and Technology” will explore the impending threat of exhaustion of key materials, from Helium-3 to Lithium to Tellurium that drives progress in our modern world. This trend, with multiple causes from the rising demand of emerging economies to the highly localized concentration of some elements, has remained below the radar for the population at large, as well as the majority of the physics community.

FIP RECEPTION TUESDAY, March 22 from 6:00 - 8:00 PM in the “Cotton Bowl” at the Hyatt Reunion Hotel

Co-Sponsors:

APS Office of International Affairs
Overseas Chinese Physics Association (OCPA)
Association of Korean Physicists in America (AKPA)
American Chapter of the Indian Physics Association (ACIPA)
Iranian-American Physicists Group Network (IrAP)

Please join us as we honor new FIP members recognized as APS Fellows! Co-sponsors will be giving out awards. The FIP reception is a wonderful opportunity to interact with speakers, officers of the American Physical Society, members of the co-sponsoring organizations, and your fellow FIP members!

Shaping Regional Identities through Research Funding Policies T8. WEDNESDAY, MARCH 23, 2011, 2:30 PM - 5:30 PM Chair: Giulia Pancheri, INFN Frascati National Laboratories

“Shaping Regional Identities through Research Funding Policies” will tackle some of the key funding policy issues that shape the progress and character of entire world regions, in areas from energy and information technology infrastructures, to the structure and modes of operation of educational and research institutions, to the governmental framework and its level of support for innovation, to the support for science and the view of its role in each nation and region. The distinguished speakers include Luisa Cifarelli, President of the

European Physical Society; Carlos Alberto Aragão de Carvalho, President of the National Council of Science and Technology (CNPq) of Brazil; Rohini Godbole, a member of the Scientific Advisory Committee to the India Prime Minister; Jean-Pierre Ezin, Commissioner for Human Resources, Science and Technology of the African Union; and Harriet Kung, Associate Director of Science for Basic Energy Sciences, Department of Energy.



History of Physics and International Programs V24 Contributed Paper Session, Thursday, March 24, 8 AM. Room: D167 Chair: Gloria Lubkin, AIP, editor emerita of Physics Today.

This session is co-sponsored with the Forum on the History of Physics. FIP-related talks concern US-Finland cooperative research and education, physics in Africa, the impact of materials science in Latin American countries, and the perspective of an American postdoc in East Asia.

Migrations of Physicists X8. THURSDAY, MARCH 24, 2011, 2:30 PM - 5:30 PM Chair: Noemie Koller, Rutgers University

“Migrations of Physicists”, co-organized with the Forum on the History of Physics, will track the major movements of physicists among the regions of the world including Central Europe, Russia before and after the Fall of the Soviet Union, and China and the U.S., as well as the research and training networks and programs that have arisen to provide researchers’ with improved “mobility,” a key aspect of a physicist’s work and life.

Experiences and Issues for Young Physicists in the International Arena; Impact on the Future of Physics (Followed by a Panel Discussion) Y8. FRIDAY, MARCH 25, 2011, 8:00 AM - 11:00 AM Chair: Amy Flatten, American Physical Society

“Experiences and Issues for Young Physicists in the International Arena; Impact on the Future of Physics”, co-organized with the Forum on Graduate Student Affairs, will address some of the key issues facing students and young physicists living and working abroad, from visa issues, to attitudes towards women in academia in different countries, to working in large international collaborations, to the language barrier. Following the presentations, OIA Director will chair a panel on “Issues Facing International Physicists and the Future of Physics”

FIP Sessions and Events at the APS April meeting *Harvey Newman*

There will be three sessions sponsored or co-sponsored by FIP at the APS 2011 April. The April meeting runs from Saturday April 30 through Tuesday, May 3, 2011 and will take place at the Hyatt Hotel Orange County, Garden Grove, California. The Hyatt is immediately adjacent to Anaheim.

The Digital Divide in 2011

Sunday, May 1 - 1:30 PM-3:18 AM

“The Digital Divide in 2011” will present the current perspective on the evolution, status and outlook for the Divide that separates the more- and less-technologically advanced regions of the world. The 21st century has been marked by some leading and emerging nations’ realization that a focus on advances in information technologies, as enablers of education, knowledge sharing, international collaboration and scientific progress, is a powerful means to economic leadership. The distinguished speakers at this session are leaders in this field, who will review the status and outlook for the Divide and the means to reduce or close it in the coming years, in spite of the influences that tend to open it further. One of the speakers at this session is Hamadoun Touré, Secretary General, International Telecommunications Union (ITU).

Prize Session

Monday, May 2 - 3:30 PM-5:18 PM

A special **Prize Session** will host two distinguished honorees who will receive their awards at the session. Professor Miguel José Yacamán, winner of the Wheatley Prize for his work on behalf of his Mexican colleagues and physics in Mexico, will speak on his research as well as its relationship to the rise of physics in Latin America. The winner of the Nicholson Medal for Human Outreach, FIP’s own Past Chair Noemie Benczer-Koller, will give her perspective on her career devoted to advocating the freedom of scientists around the world and fostering equal opportunities for women in science, in her talk entitled “Physics Outreach: Social Benefits.”

Science Diplomacy

Tuesday, May 3 - 1:30 PM-3:18 PM

“Science Diplomacy” Co-sponsored with FPS, will present perspectives on this important issue in its various forms, from encouraging technological progress and economic development in the third world, to promoting equality and peace on a foundation of open international scientific collaboration, to the relationship to political policy. The speakers at this session, all key players in this area through their leadership of global projects or their central roles in representing science on the world stage, will present their views and give their perspectives on this subject whose importance has continued to accelerate since the late 20th century. Our distinguished speakers include: APS President and Caltech Professor Emeritus Barry Barish, Neal Lane who is a Senior Fellow in Science and Technology Policy at the Baker Institute and a former NSF Director as well as the former Science Advisor during the Clinton Administration, and Norman Neureiter who is the Director of the AAAS Center for Science, Technology and Security Policy and was the Science Advisor the Secretary of State during the Bush administration.

Harvey Newman (newman@hep.caltech.edu) is a Professor at Caltech, a high-energy physics experimentalist and Chair of the FIP. He is also engaged in work on Digital Divide issues in many regions of the world. During 2010, as FIP Chair-Elect and FIP Program Chair he organized the FIP sessions for the APS Spring 2011 meetings.



Global Science and Technology Initiative Launched

From Harvey Newman

The Global Initiative on Science and Technology (GIST; <http://gistinitiative.org/>) being managed by CRDF Global, was launched December 14 to advance scientific, academic, and technological collaboration between the U.S. and the Muslim world. GIST is one of the primary science and technology initiatives to be implemented following the speech by President Obama in Cairo in June 2009. The initiative will have three main areas of activity: (1) developing specific recommendations for science, technology, and innovation capacity-building, particularly in agriculture, energy, health, and information technology, through a consultative process with regional experts and leaders (the results of which will be used to guide the creation of pilot projects); (2) establishing a digital science library for the Maghreb countries of North Africa; and (3) developing training and mentoring programs for scientists in selected countries. Initial funding for two years is being provided by the Department of State.

An invitation to join the Friends of the Committee on International Freedom of Scientists (CIFS) *Noemi Mirkin*

The American Physical Society's Committee on International Freedom of Scientists (CIFS) monitors concerns regarding human rights for scientists around the world. It supports scientists whose rights have been violated, and advocates for them with relevant governmental and non-governmental organizations.

We are informing you of the start of the "Friends of CIFS listserv". This listserv is designed to disseminate information to those interested in the work of CIFS, and to provide a forum for its members to share any information they have that advances the cause of human rights for scientists.

If you would like to support CIFS by joining this listserv, please send a blank message to join-cifsfriends@lists.apsmsgs.org.

Noemi Mirkin is in the University of Michigan Biophysics Department and is FIP Secretary/Treasurer.

India U.S. Travel Grants *Michele Irwin*

Physicists and physics graduate students in India and the United States can apply for travel grants to pursue opportunities in the other country. This program is sponsored by the Indo-U.S. Science and Technology Forum (IUSSTF) and administered by the American Physical Society.



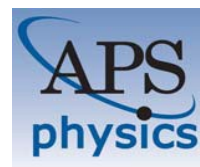
The **APS-IUSSTF Professorship Awards in Physics** funds physicists in India or the United States wishing to visit overseas to teach short courses or provide a physics lecture series delivered at a U.S. or Indian university. Awards are up to U.S. \$4,000.

Through the **APS-IUSSTF Physics Student Visitation Program**, U.S. and Indian graduate students may apply for travel funds of U.S. \$3,000 to pursue opportunities in physics. The travel funds could be used to attend a short-course or summer institute, to work temporarily in a laboratory, or for another opportunity that the student and the host professor believe is worthy of support. The Physics Student Visitation Program aims to mostly support graduate student travel to India by U.S. citizens, while enabling some students of Indian citizenship to travel to the U.S.

Further details about both programs, including proposal guidelines, are provided at www.aps.org/programs/international/us-india-travel.cfm. **Deadline is 15 March 2011**

Accepting Applications: Brazil-U.S. Exchange Program *Michele Irwin*

The Sociedade Brasileira de Física (SBF) and the American Physical Society (APS) are pleased to announce the launch of a new exchange program for physics graduate students and professors in the U.S. and Brazil.



Through the **Brazil-U.S. Physics Student Visitation Program**, graduate students can apply for travel funds to pursue a breadth of opportunities in physics, such as: 1) attending a short-course or summer institute; 2) visiting with a professor in his/her field of study; 3) working temporarily in a lab; or 4) any other opportunity that the student and professor feel is worthy of travel support. Grants are for up to USD \$3,000.

The Brazil-U.S. Professorship/Lectureship Program funds physicists in Brazil and the United States wishing to visit overseas to teach a short course or deliver a lecture series in the other country. Grants are for up to \$4,000.

The application deadline is 30 April 2011. Additional information about the program, including application guidelines, can be found at www.sbfisica.org.br/v1/ and www.aps.org/programs/international/. Applications from U.S. applicants should be submitted to Michele Irwin, APS Office of International Affairs, Irwin@aps.org. Applications from Brazilian applicants should be submitted to Maria Beatriz Mattos, SBF, biamattos@sbfisica.org.br.

Michele Irwin is the International Affairs Programs Administrator

FIP Members Recognized as APS Fellows

Congratulations are extended to these six FIP members for their significant contributions to physics and its diffusion by fostering cooperation and communication among physicists of all countries:



Li-Zhi Fang, University of Arizona

Citation: For his important work in cosmology and early-universe physics; his inspiring leadership, teaching and mentoring of students in China, the United States and around the world; and his tireless, selfless, courageous and continuing advocacy of human rights in China.

Vasudevan Lakshminarayanan, University of Waterloo, Ontario, Canada

Citation: For innovative application of advanced methods of theoretical physics and mathematics to problems in classical optics, vision science, and biomedical engineering; and for his dedication to the promotion of science education in developing countries.



Seung Lee, Dongguk University, Seoul, Korea

Citation: For important contributions to low-dimensional electron systems and spintronics in diluted magnetic semiconductors, and to physics education over 25 years as a physics educator, and for enthusiastic work on the advancement and promulgation of physics knowledge into the international semiconductor and military societies.

David McClelland, Australian National University, Canberra, Australia

Citation: For his ground-breaking experimental work in techniques to extend the sensitivity of gravitational wave detection beyond the standard quantum limit and for promoting world-wide collaboration in gravitational wave research



Sudip Sen, Lancaster University, Lancaster, United Kingdom

Citation: For his formulating novel theories in flow and plasma dynamics. These have opened up a new avenue to the ultimate breakthrough in world's fusion energy research and can also completely change the conventional wisdom in space science. Also for his leadership in promoting extensive international cooperations specially involving Asia-Pacific and Indian region with Europe and North America.

Penger Tong, Hong Kong University of Science & Technology

Citation: For his insightful experiments to elucidate interesting new physics in turbulent thermal convection and soft matter systems, and his many contributions to the development of international research and education in experimental physics.



Noemie Koller Receives APS Nicholson Medal for Human Outreach *Herman Winick*

In a fitting recognition of her decades of service to physics and physicists, and to her four years of service in the Chair line of the APS Forum on International Physics, Noemie Koller has been awarded the APS Nicholson Medal for human outreach. The citation reads:

"For unselfish commitment to advocating the freedom of scientists around the world and for leadership in fostering equal opportunities for women in science."

On the website <http://www.aps.org/programs/honors/awards/nicholson.cfm> you can see the previous winners of this prestigious award and some background on Noemie's outstanding research and outreach activities. Remarkably she has engaged in so many outreach activities along with an extremely active career in teaching and nuclear physics research, authoring or co-authoring more than 100 refereed journal articles

Noemie's career in physics was strongly shaped by her thesis advisor at Columbia University, Chien-Shiung Wu, who was described by T. D. Lee as "one of the giants of physics. In the field of beta-decay, she had no equal." Wu was known for her extraordinary work ethic and her devotion and attention to her students. In a talk "Personal Memories of Chien-Shiung Wu" at the April 1997 APS meeting Noemie referred to Wu as "a unique scientist, a very special human being and a friend". Her warm tribute to her mentor became an article in the July 1997 issue of the newsletter of the APS Forum on Physics and Society. [I recommend it to all.](#)



Noemie Koller and C.S. Wu

Noemie is clearly a worthy disciple of her mentor. Highlights of her career have been briefly summarized in a sketch by Paul Leath:

"Noemie Benczer Koller was born in Vienna, Austria on August 21, 1933. She received her B.A. Degree from Barnard College in 1953, and her M.S. (1955) and Ph.D.

(1958) Degree in experimental physics from Columbia University, New York, NY, where she continued as a postdoctoral research associate until 1960.



She joined the Rutgers Physics Department in the fall of 1960 as an assistant professor, and was the first- female assistant professor appointed to the faculty of Rutgers College, which then had an all-male student body. She received tenure in 1965, and thus also became the first woman ever to be promoted to tenure in the faculty of Rutgers College. At Rutgers she was a major member of the nuclear physics research group working on the tandem Van de Graaff accelerator, as well as an important condensed-matter physicist, performing experiments using the Mossbauer effect. She was later the Director of the Nuclear Physics Laboratory (1986-89).

She also served in the administration of the University as the Associate Dean for Sciences of the Faculty of Arts and Sciences (1992-96), and was active in the American Physical Society (APS), serving on many national committees, and as Chair of the 2,500-member APS Nuclear Physics Division (1993-94). She is a fine teacher and mentor of students. She also is a strong supporter of and an outstanding role model for women in science. Rutgers Department of Physics & Astronomy has had, for many years, as many women on its faculty as any other physics department in the country, which is in no small part due to Noemie Koller's presence and leadership."

She has received many awards. Among these are

- Fellowship in APS and AAAS
- New Jersey Women of Achievement Award, 1997
- The 2001 Rutgers University Daniel Gorenstein Memorial Award in recognition of her scholarly excellence in experimental nuclear physics research and 40 years of dedicated service, administration, and teaching at Rutgers.
- The 2006 Distinguished Service Award of the APS Division of Nuclear Physics

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In another tribute to her, the Noemie B. Koller Scholarship is awarded annually to two Rutgers women physics majors who, in the judgment of the physics faculty, have demonstrated outstanding academic excellence.

Her human outreach activities include service on numerous committees of AAAS, APS, NYAS, and Rutgers dealing with gender issues, human rights, diversity, international physics, and academic freedom. Prominent among these was her service as Chair of the APS Committee on International Freedom of Scientists and the Forum on International Physics, which deal with the above mentioned aspects of physics.

Her service to the physics community over many decades is extraordinarily broad. It includes participation in more than 30 advisory and review committees of AAPT, APS, DOE, NAS, NSF, and Rutgers, as well as editorial boards of several journals.

As a long term friend (we were graduate students together at Columbia) it was my pleasure to work with Noemie when she entered the FIP chair line in 2007. During the past year as FIP Chair she set an extremely high standard for hard work and leadership, as she dealt with several delicate issues and personally gathered the material for the Fall 2010 issue of the FIP Newsletter.

More can be seen about Noemie on a Google search, on Wikipedia, and in her own words at Girl Geeks/My Story:

<http://sciencewomen.rutgers.edu/profiles/index.php?q=myStory&id=351>

Congratulations to Noemie, an outstanding scientist and a remarkable human being, upon receiving the Nicholson Medal.

Professor Herman Winick is at Stanford University. He was the Chair of the FIP in 2007 and currently the APS Councillor for the FIP, 2010-13

The ICFA2010 School/Workshop on Instrumentation in Elementary Particle Physics, Bariloche, Argentina, January 11-22, 2010

Marleigh Sheaff

Eighty-one graduate students, 67 of them from countries in the Americas, participated in ICFA2010, which was held at the Institute Balseiro at the Center for Atomic Physics in Bariloche, Argentina. This was the latest in the series of very successful biennial schools/workshops that was initiated in the late 1980's by the ICFA Panel on Instrumentation, Innovation, and Development.

This quality educational program is unique. In addition to being presented with lecture courses and topical seminars, the students have the opportunity to participate in "hands-on" laboratory sessions in small groups working with their peers from different countries. The laboratory setups are much the same as those

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Photo credit: Ariella Cattai, Chair of the ICFA Panel on Instrumentation

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used in advanced university laboratory courses or by research groups when prototyping detectors. Their participation allows students to develop valuable skills as well as to gain confidence in working with apparatus.

Working so closely with students from a variety of other countries provides U.S. students with international experience early in their careers. This is invaluable preparation for their participation in the large international experimental efforts that are the norm today. The number of applications to ICFA2010 from US students was larger than for previous ICFA Schools/Workshops, which indicates that the students themselves recognize the value of international exposure.

The lecture program presented covered all major detector systems used in accelerator-based particle physics experiments. These in-depth presentations were given by recognized experts in detector research and development. They included many details about each of the various detector systems including their expected performance. A good understanding of detectors is neces-

sary for the correct interpretation of experimental data in performing analysis. It is also needed by the upcoming generation of experimentalists so that they will have the capability of designing and building apparatus for the experiments of the future. Several seminars were presented that described the application of detectors either inside or outside of particle physics experiments, e.g., for use in medicine.

The quality of all presentations was well above average. In answer to the questionnaire they filled out at the end of the event, student participants rated them as being at about the right level and very important for them in their future careers. Congratulations are due to Xavier Bertou, school director, and the others on the local organizing committee for the organization of this very successful event. More details are available on the ICFA2010 Web Site: <http://particulas.cnea.gov.ar/workshops/icfa/>.

Marleigh Sheaff is a Senior Scientist Emeritus in the University of Wisconsin Physics Department.

The First African School on Fundamental Physics and its Applications (ASP2010)

Christine Darve on behalf of the ASP2010 Organizing Committee



ASP2010 students and lecturers during the week dedicated to Accelerators and other HEP Applications (Photo by Christine Darve)

The first School on Fundamental Physics and its Applications, ASP2010, took place in Stellenbosch, South Africa, from August 1st to 21st, 2010, with the general aim of fostering science in Africa.

The aim and mission of this biennial school is unique. The “raison d’être” is to build the capacity to harvest, interpret, and exploit the results of current and future

physics experiments with particle accelerators and to increase proficiency in related applications and technologies. Based on those principles, a small group of scientists organized this first ASP school including Bobby Acharya (ICTP), Ketevi Assamagan (BNL, USA), Christine Darve (FNAL, USA), John Ellis

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(CERN) and Steve Muanza (CNRS-IN2P3, F).

Following a selection process, 65 students from various backgrounds and education levels were invited to participate. 10 students came from South Africa and another 50 students came from 17 other African countries. 5 other students from Canada, Germany, Switzerland, the USA and India, also attended helping to create a melting pot of cultural diversity. African students were fully supported financially to attend the intensive three-week school. 16% of the students were women. Approximately 40 devoted and motivated lecturers, tutors and organizers came from around the world and from the local physics community. Most of our prestigious lecturers' institutions supported their travel costs.

The school was based on a close interplay between theoretical, experimental, and applied physics. It covered a wide variety of topics: particle physics, particle detectors, astro-particle physics and cosmology, computing, accelerator technologies and some applications, such as medical physics, synchrotron radiation, light sources, and magnetic confinement fusion.

The three-week school had a heavy packed agenda. Typically, class days consisted of four academic lectures of 45 minutes followed by three hours of discussion and/or practical sessions. Discussion and exercises were organized by the lecturers to motivate student participation. Laboratory sessions were organized to give the students "hands-on" scientific training, e.g. students became acquainted with the use of scintillation detectors and performed measurements of environmental radioactivity at the iThemba Laboratory for Accelerator Based Sciences (iThemba LABS). Laser practicals and a computing tutorial for simulations using the GEANT4 toolkit were also available at the Univ. of Stellenbosch. Our students, appreciated the opportunity to communicate and learn directly from senior scientists.

To complement the fundamental physics classes, ASP2010 emphasized the role of high-energy physics in medicine, computing and other areas of technology through the "applications" aspect of the program. The proximity of iThemba LABS, situated between Cape Town and Stellenbosch, played a key role in organizing the school. As well as being an important producer of radioisotopes, it is the only laboratory in the southern hemisphere where hadron therapy is performed with neutron and proton beams.

To highlight established research in fundamental physics in South African universities and research institutes,

several high-profile South African scientists and government officials participated in the last day of the school, including Daniel Adams, Chief Director: Emerging Research Areas & Infrastructure – Human Capital and Knowledge Systems at the South African Department of Science and Technology. This outreach and forum day reviewed the practical aspects of fundamental physics, which could be used as a gateway to innovation and to enhance future collaborations. Many institutes were supportive of our effort. Emmanuel Tsismelis, adviser to the CERN Director General stated "CERN provides a gateway to forefront science through innovation and by bringing the world together at this rainbow high-energy physics laboratory through global collaboration. CERN looks forward to strengthening ties with Africa and to discovering and sharing the new science of the 21st century together through Ubuntu". (Ubuntu is an ethical concept of African origin and is also a Linux-based operating system.)

In addition to academic lectures, a video-conference with Young-Kee Kim, Fermilab's Deputy Director, provided a vision of science on a planetary scale; a webcast that connected the students to the CERN Control Centre enabled them to experience a live demonstration of proton acceleration; and special talks by John Ellis, Albert de Roeck and Philippe Lebrun from CERN, and Jim Gates, from the University of Maryland (a scientific advisor to President Obama), also made big impacts on the students.

This project was possible thanks to the support of 15 different national and international organizations and institutes.

These included Spain (Ministry of Foreign Affairs), France (Centre National de la Recherche Scientifique/IN2P3, Institut des Grilles, Commissariat à l'énergie atomique), Switzerland (École Polytechnique Fédérale de Lausanne, Paul Scherrer Institute), South Africa (NITheP, National Research Foundation), and the US (Fermilab, Department of Energy, Brookhaven, Jefferson Lab, National Science Foundation), as well as the international institutions CERN and ICTP. In addition, the International Union of Pure and Applied Physics offered travel grants to five female students.

Generous logistical support came from CERN. As CERN's director-general, Rolf Heuer, pointed out, "What this school has brought home very clearly is that there is the talent and the will in Africa to engage in advanced scientific education, and indeed with fundamental physics in general."

The motivation and enthusiasm of the students, who symbolize the future of fundamental physics and its

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applications in Africa, made our efforts worthwhile. One of our goals was to insure that the demanding school program and the diversity of the student's backgrounds could fuse harmoniously. During the school the students, lecturers and organizers shared the same dynamism allowing everybody to build durable networks in a physics world without borders. Lecturers and organizers have continued to guide the ASP2010 students. For example, Giorgio Margaritondo, Solid-state physics Professor at EPFL, is organizing the hosting of African students in his University and Young-Kee Kim will welcome three students to participate in the Fermilab high-energy physics program. As she points out, "lifting the lamp beside the golden door to talented African and Latin American students is the spirit of what we are building in our laboratory."

"This new series of schools will strengthen existing collaborations and develop current and new networks involving African physicists," explained Fernando Quevedo, director of the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, one of the sponsors of the school. "This activity was a big success in all respects: lecturers of the highest scientific level, a perfect example of close collaboration among several international institutions towards a single goal and, most importantly, bringing the excitement and importance of the study of basic sciences to a community with great potential. The standard set for future

activities is very high."

Chilufya Mwewa, a participant from Zambia, summarizes what the school meant for her: "Attending ASP2010 was such an extraordinary opportunity that it had a huge positive impact on my life. The school indeed enhanced my future career in physics. Thanks to you and other organizers for opening us up to other physics platforms that we never had a chance to know about in our own countries." Ermias Abebe Kassaye, a student from Ethiopia, echoed her thoughts: "I have got a lot of knowledge and experience from the school. The school guides me to my future career. I obtained the necessary input to disseminate the field to my country and encourage others to do research in this field. I am working strongly to achieve my desire and to shine like a star, and your cooperation and help is very essential to our success." A complete report of the ASP2010 is available from our web site at

<http://AfricanSchoolofPhysics.web.cern.ch>.

It is proposed to hold the second school in Ghana in 2012 and we welcome support for it! The enthusiasm of the students and the supporting institutions at ASP2010 were inspirational and give promise for the success of future international programs, collaborations and exchanges.

Christine Darve is on the staff of Fermilab and was the main organizer for ASP2010.



Esra Khaleel, an enthusiastic ASP2010 student from Sudan, studies spectroscopy of light neutron-rich nuclei at the University of Stellenbosch. Photo by Christine Darve

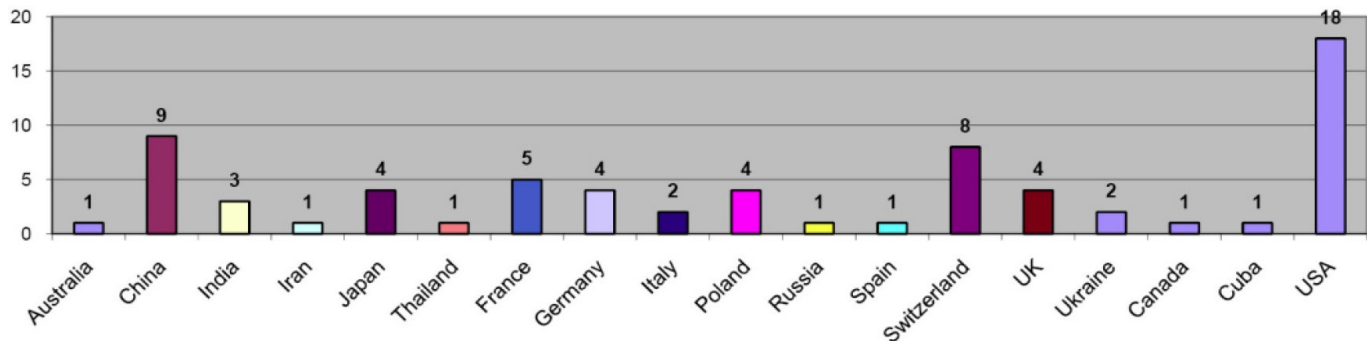


Naima Zahar (Morocco) presenting her research work in nuclear physics to Christine Darve and the ASP2010 audience. Photo by Bruce

Fifth Linear Collider School

From Ernie Malamud

The fifth in this series of international schools was held from 25 October to 5 November 2010 in Villars-sur-Ollon, Switzerland and continued the tradition of cycling the school between Europe, Asia and the Americas. 70 highly qualified students from a pool of 276 applications were selected. It is interesting to note the country distribution of the accepted students, which includes 19 from Asia and Oceania, 31 from Europe and 20 from North and South America. The [2011 school](#) will take place in October in California and will be hosted by SLAC.



The attendees at the LC school are graduate students, postdoctoral fellows and junior researchers from around the world, including physicists who are considering a career change from experimental physics to accelerator physics. To learn more, read the interesting articles on this successful school by **Barry Barish** that appear in the newsletter of the Beam Dynamics Panel of the International Committee for Future Accelerators (Edited by W. Chou):

<http://www-bd.fnal.gov/icfabd/Newsletter52.pdf>, pages 11-13, August 2010

<http://www-bd.fnal.gov/icfabd/Newsletter53.pdf>, pages 24-26, December 2010

The VIII Latin American Symposium on High Energy Physics, Valparaiso, Chile, December 6-12, 2010 *Marleigh Sheaff*

The Simposio Latinoamericana de Fisica de Alta Energia, or SILA-FAE, is the premier event in high energy physics in Latin America. It is held every two years, is organized by Latin American physicists,

and takes place in one of the Latin America countries on a rotating basis. The most recent one was held this past December at the Universidad Federico Santa Maria in Valparaiso, Chile. Claudio Dib and his colleagues from Chile did an admirable job of organizing this meeting.

The participants were presented with an excellent program of seminars on a wide variety of topics. Plenary sessions were held in the morning and early afternoon. Two parallel sessions containing shorter, more specialized talks divided into subjects relevant to non-overlapping interest groups fol-

lowed each afternoon. Wednesday afternoon was left open to allow the participants time to tour this most interesting port city. There was much interest in doing this, since Valparaiso has been designated a World Heritage Site by UNESCO.

The variety of topics covered in the presentations was outstanding. The latest results from the four LHC experiments made it clear that all four are already working well, and very exciting new physics can be expected just around the corner. Other talks covered the latest results from a diverse group of experiments in neutrino physics and

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cosmology. Since there are a number of prominent theoretical particle physicists and phenomenologists working in Latin America, many of the talks covered their recent research in these areas. A good number of the experimental talks were also presented by Latin American physicists, many of whom work on the forefront experiments of today.

A special program of talks was presented by Fermilab physicists on Friday morning. Young-Kee Kim, Deputy Director of Fermilab, gave an excellent talk on current activities at the lab and welcomed the participants to take advantage of the many opportunities the lab offers to visitors at all stages of their careers. Marcela Carena listed the theorists working at the lab and their current interests. This served as an introduction to details of a special program for Latin American theory graduate students that she initiated at the lab whereby qualified students from an institution in Latin America are supported for a six-month stay at the lab during which they are able to work with anyone in the Fermilab theory department. These talks were followed by three others

on experimental opportunities: on the Energy Frontier, given by Jacobo Konigsberg of CDF; on the Intensity Frontier, given by Jorge Morfin of MINERvA; and on the Cosmic Frontier, given by Juan Estrada of the Dark Energy Survey.

At a meeting of the SILAF AE Scientific Committee held during the event in Chile it was decided to hold the next SILAF AE two years from now in Brazil. Rogerio Rosenfeld of the Institute of Theoretical Physics in San Paulo will be the main organizer. Rosenfeld presented some exciting news at this meeting. ICTP, which has its main offices in Trieste, Italy, will operate a branch office at his institution in Brazil. This decision is a clear recognition of the important role Latin American physicists play in the field of high energy physics. More details are available on their web site: <http://www.fis.utfsm.cl/silafae2010/>

Marleigh Sheaff is a Senior Scientist Emeritus in the University of Wisconsin Physics Department.



The Music of Physics Lidia Smentek

Music is a language of emotions that goes beyond science. It propagates in space and time, and is heard by our ears and interpreted by our minds and hearts. There is music of the universe, music of the human soul, music created by instruments and voices organized with sequences of sounds, and the music of physics.

A frequent approach is to analyze music in terms of acoustics: vibrations, rhythm, resonances, wavelengths and frequencies, pitch, overtones, dissonance, and harmony. But acoustical physics is not the subject of this article. To show the difference between the *physics of music* and the *music of physics* we begin with the scientific approach to music of Pythagoras and his mystical yet mathematical philosophy based on the connection between music and numbers. He concluded that all of nature is in

harmony, and thus arises from numerology. The Sun, the Moon and the planets revolve around the Earth in their spheres, creating a musical harmony. Legend says that Pythagoras actually heard the music of the celestial movements, and therefore was able to establish the consonant musical intervals presented in his famous *Music of the Spheres*. For some, this is just a mathematical concept; others believe that after deep meditation it is indeed possible to hear such music of physics, perhaps not by ear, but spiritually.

In Aristotle's vision of the Universe and celestial movements, the spheres were concentric; each made of the fifth element, the *aether*, and moved by a god. Ptolemy in his important treatise *Harmonics* described the existing music of the spheres, and introduced a planetary concept of the Cosmos in order to explain the irregularities observed in the motion of the planets. Johannes Kepler 15 centuries later applied the concept of the music of the spheres, and defined in his work from 1619, *Harmonices Mundi* the music of physics: "*The heavenly motions...are nothing but a continuous song for several voices, perceived not by the ear but by the intellect*".

One can only wonder which music Nicolaus Copernicus heard while changing the order of the World during his work on *De revolutionibus orbium coelestium*, devoted to the revolutions of the celestial spheres.

The heavenly sounds and harmony

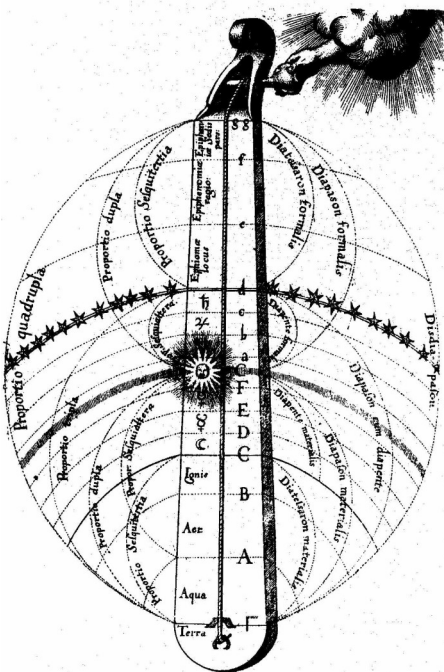
of celestial bodies have inspired many artists, including musicians; this is how the music of physics is created! The British composer Gustav Holst (1874-1934) reflected this music in *The Planets*, an orchestral suite with seven movements written between 1914 and 1916. However, the concept and inspiration of this music were based on astrology rather than astronomy. The music expresses the impact of the planets upon the human psyche and presents different colors of emotions and various characteristics of each planet.

Samples of this music can be enjoyed at—

- *Saturn, The Bringer of Old Age* http://www.youtube.com/watch?v=VQ0Z6kD06Us&feature=list_related&playnext=1&list=MLGxdCwV_VULXcBakDyATFilAxILp8Z0VG
- *Jupiter, the Bringer of Jollity* <http://www.youtube.com/watch?v=Nz0b4STz1lo&feature=related>,
- Music of Planets is illustrated by a video collection of NASA/JPL/ESA missions to the planets in the Solar System¹, at <http://www.youtube.com/watch?v=dxEekUy0Ehk&feature=related>

Music can also paint a portrait and even picture a physics experiment. Philip Glass² described his composition *The Light* as "A portrait in music of the scientists Albert A. Michelson and Edward W. Morley and their studies of the velocity of light through their memorable experiments concluded at Case Western Reserve University, Cleveland, Ohio, 1887". This piece was composed to commemorate the centennial anniversary of the Michelson-Morley experiment. Peter Michelson³, the grand nephew of Nobel Laureate Albert Michelson, attended the ceremony in Cleveland

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Robert Fludd (1574-1637), *Divine Monochord* shows the music of the Ptolemaic Universe tuned by the hand of God (copy from the Archives of Vanderbilt University)

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Symphony Hall, and said: “This was Philip Glass’ musical version of the Michelson-Morley experiment. For me, it just fit beautifully. You could kind of hear the light sloshing around in the interferometer. (...) It was a union between music and science that I thought was fascinating⁴”. In the program note the composer wrote that “In a way, these experiments formed in my mind an almost ‘before and after’ sequence. The ‘before’ represented something like 19th century physics. The ‘after’ marks the onset of modern scientific research. Perhaps this may appear somewhat simplified from a scientific point of view, but for a musician it provided a dramatic contrast. (...) This is a portrait not only of the two men for whom the experiments are named but also that historical moment heralding the beginning of the modern scientific period”.

The Newsletter of the Hansen Experimental Physics Laboratory, Stanford University⁴, announced on November 2, 2009 that “The music of the spheres will take on a new meaning during the 2009 Fermi International Science Symposium to be held in Washington, D. C., and November. 2-5, 2009”. Peter Michelson, inspired by *The Light* used music to highlight this symposium, a celebration of one-year of scientific achievements of the Fermi Gamma-ray Space Telescope, GLAST⁵. Nolan Gasser⁶ composed the GLAST Prelude, Op. 12, for brass quintet, to mark the launch of GLAST in June 2008, and the one-year mission of the telescope was concluded by Gasser’s *Cosmic Reflection: A Narrated Symphony, Op. 15*.

The music conveys the excitement of all the steps of the project, and includes themes of the national anthems of the collaborating countries. To enhance the artistic performance Rich Melnick from NASA’s Goddard Space Flight Center created a video synchronized with the music. This is a beautiful piece of art appreciated not only by a physicist. Its emotional contents can be enjoyed over and over again, since it is available at http://www.classicalarchives.com/prs/glast_prelude.html.

It was challenging to tell the history of the Universe through music. The narrative was prepared by physicist and author Lawrence Krauss⁷ and poetically mastered by Pierre Schwob⁸. Peter Michelson, *spiritus movens* of this monumental artistic tribute to science, said “Music, science and the visual arts as well are closely connected – both intellectually and emotionally – to the excitement of discovery in fundamental research⁴”.

What can be more fundamental in physics than the fundamental constants? Is it possible to illustrate them using music as a medium of expression? Physicist Jerzy Warczewski⁹ explored this idea when he approached the famous contemporary Polish composer Wojciech Kilar¹⁰, suggesting the commemoration of the World Year of Physics 2005, the 100th anniversary of the *Annus Mirabilis*, by composing new music for that occasion. The musical motif chosen by physicist Warczewski and used by composer Kilar were fundamental physical constants as described in the next article, quite a contrast with celestial motions and heavenly harmony

Light, music of the spheres, heavenly motions, cosmos, GLAST penetrating space and returning pictures from the distant past, and finally the basic physical constants, the pillars of ancient and modern physics; are they not all the music of physics? Music heard by ears, intellect, soul, mind and heart as *Harmonices Mundi*.

Footnotes

1. Performance by the Skidmore College Orchestra (<http://www.musopen.com>), video from NASA/JPL at <http://www.jpl.nasa.gov> and the ESA/Hubble Space Telescope Information Center at <http://www.spacetelescope.org>
2. American music composer, considered as one of the most influential composers of the late 20th century
3. Stanford astrophysicist, Principal Investigator for the Fermi Large Area Space Telescope project and Director of Stanford’s Hansen Experimental Physics Laboratory (HEPL)
4. Stanford University, HEPL, November 2, 2009, http://hepl.Stanford.edu/cosmic_reflection.html
5. Renamed on August 26 2008 in honor of Enrico Fermi
6. American composer, pianist and musicologist (Ph.D. from Stanford University)
7. Professor of Physics, Foundation Professor of the School of Earth and Space Exploration and Director of the Origins Project at the Arizona State University
8. Founder of the Classical Archives, the largest classical music site on the web, interested in the latest advances in astrophysics, cosmology, and in foreign policy research, Asteroid (32890) Schwob has been named after him, author of several books and holder of several patents
9. Professor of physics, Silesian University, Katowice, Poland; editor-in-chief of the *Advances in Physics*, the magazine of the Polish Physical Society.
10. Composer widely known for his symphonic work and film scores (for Coppola’s, Wajda’s and Polański’s movies, for example).

Lidia Smentek (Lidia.Smentek@Vanderbilt.edu) retired after four decades at Nicolaus Copernicus University (Toruń, Poland) and is a Professor at Vanderbilt University.

On the Genesis of the *Sinfonia de motu* (Symphony on Motion)

Jerzy Warczewski

On September 12, 2005, the opening day of the Congress of Polish Physicists, a concert for its participants took place in Warsaw in the National Philharmonic. During this evening performance was the world premier of a symphony by Wojciech Kilar, a famous Polish composer born in 1932. The symphony was written to commemorate the World Year of Physics 2005 and was performed by the Warsaw Philharmonic National Orchestra of Poland, soloists, singers and chorus.

At the end of February 2004 I asked Wojciech Kilar to write a piece of music on the occasion of the World Year of Physics 2005. Before I went to him I realized that I could not go with my hands empty, and I took with me a musical theme based on the notes whose letter symbols are identical with the letter notation of fundamental physical constants and concepts: c – speed of light, h – Planck's constant (represented by B in the English musical scale), G – gravitational constant, e – elementary charge and at the same time the first letter of the name *Einstein*, and finally a – the first letter of the word *atom*. When I gave these five notes, C, B, G, E, A to Kilar, I emphasized that this sequence is not binding. I gave a short definition of these symbols to the Maestro and mentioned that we were celebrating the hundredth anniversary of the publication of the leg-

endary papers in which Einstein laid the foundations for the special theory of relativity, quantum physics and the theory of Brownian Motion. He was fascinated by my explanation of Brownian Motion, the constant motion of particles in the microworld, and inspired by this idea devoted the entire symphony to motion and named it in Latin *Sinfonia de motu* (Symphony on Motion). Finally on March, the 6th, 2005 he told me he had completed the composition and dedicated it “To the Polish Physicists in the World Year of Physics 2005.”

Sinfonia de motu is a four-movement composition lasting one hour. In the fourth movement, the choir and the two soloists, soprano and baritone, join the orchestra. The soloists also sing in the second and third movements. The words are from the *Divine comedy* by Dante Alighieri. The musical theme is a kind of “music of the spheres”. A few months after completing the Symphony, Kilar said to me: “This is my Ninth Symphony.” Of course, the point was that as in Beethoven's Ninth Symphony, there is a *Finale* with the choir and the soloists. In Beethoven's Symphony words are by Friedrich Schiller, *Ode an die Freude*, whereas in Kilar's, the title words of Dante, paraphrased in German are *Ode an die Liebe*. Kilar was able to express from

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Professor Warczewski congratulates Wojciech Kilar (right) after a concert of his music compositions in Katowice, Poland
(Photo by Arkadiusz Ławrywianiec, www.areklawrywianiec.com)

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Dante's text, "*La gloria di colui che tutto move...*" the fascination with motion.

The Symphony on Motion premiered on the evening of the first day of the Polish Physical Society meeting in 2005. The composer said that "his idea of the symphony is to combine two perceptions of the World and to confront in music a purely physical concept of motion with that based on Dante's understanding of divine motions and their Creator."

Dante writes about love, which moves the Sun and other stars, and there is also *luce eterna*, eternal light. Kilar considers this symphony as the most religious musical piece among his compositions. It is extremely interesting that he has gone this way, although in our first meeting in which I proposed writing a symphony to him, he announced, that I had come at a propitious

time on his creative path, because he was fed up with composing religious and patriotic music, while the idea of writing this symphony immediately inspired him. He expressed this thought many times during the entire creative process, as well as after completing the composition and after its first performances. However, it is now clear that his genius led him, contrary to his initial feelings and intentions, once again into the fields of philosophy, theology and religion. Indeed, the depth of this composition seems to be related to the composer's philosophical and theological vision of his work, as well as of the whole world.

Professor Jerzy Warczewski (warcz@us.edu.pl) is on the faculty of the Institute of Physics, University of Silesia Katowice, Poland and editor-in-chief of Advances in Physics, the bimonthly journal of The Polish Physical Society.

University of Minnesota Undergrads Visit Middle East Universities and Laboratories *Marvin L. Marshak*

In late May and early June 2010, the first University of Minnesota class ever allowed by the University to travel to the Middle East visited companies, universities, laboratories and other sites in Israel and Jordan. The class "Physics 4993: Science and Technology in the Middle East" was led by University of Minnesota Professor Marvin L. Marshak. The goals of the class, which included 14 science and engineering majors, were to increase students' understanding of how science and technology may be able to address challenges faced by Israel and Jordan and how science and technology are pursued in those countries. In addition, the students learned about the culture and politics of Israel and Jordan and they were able to inform their preconceptions about these countries with first-hand observations. Because Israel is on the U.S. State Department Travel Warning list, the University required a special review of the itinerary and travel arrangements for the class.

Physics 4993 began with a series of on-campus classes during the Spring 2010 Semester. These classes oriented students to the details of the scheduled visits in the Middle East and provided context for those visits. Students were assigned a specific site to research and they were asked to provide a short orientation talk on

that site to the rest of the class. The University Study Abroad Office also provided an orientation session on travel safety and the University's expectation for students studying abroad. Students were asked to read New York Times' columnist Tom Friedman's book *From Beirut to Jerusalem*, as a general orientation to the complexities of the Middle East. Since Mr. Friedman grew up in Minnesota, his perspectives are particularly relevant to University of Minnesota students, who are mostly from the Upper Midwest.

The Physics 4993 class arrived in Israel on May 21, minutes before the beginning at sunset of the Jewish holiday of *Sukkot*. The class spent its first days in Israel in Jerusalem, followed by Haifa and then Tel Aviv. The class then left Tel Aviv for the South, stopping in Be'er Sheva, a Bedouin camp near Arad and Eilat. The group then crossed the land border into Jordan, stopping in Aqaba, Petra, Amman, Allan, Jerash and Irbid. The class returned to the U.S. on June 4 via a non-stop flight from Amman to New York. The general arrangement of the itinerary was for the class to visit scientific and technical sites during the work week (Sunday through Thursday in Israel) and to tour historic and cultural sites on weekends and holidays.

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In total, the Physics 4993 class visited sites and interacted with faculty and staff members from more than 40 different universities, companies and organizations. Specific sites and interactions included all seven research universities in Israel (Hebrew, Haifa, Technion, Tel Aviv, Weizmann, Bar Ilan and Ben Gurion), one Palestinian university (Al Quds) and three universities in Jordan (University of Jordan, University of Jordan—Aqaba and Jordan University of Science and Technology); global companies such as IBM and Intel; Israeli companies such as Via Maris Desalination, SuperDimension (biomedical devices), Hadasit (technology transfer) and Check Point Software; an Israeli Defense Forces drone base, the Aqaba Special Economic Zone Authority and the U.S. Agency for International Development in Amman. A special highlight for the class was a visit to the SESAME Laboratory in Amman, Jordan. SESAME is a synchrotron radiation facility, currently under construction by a consortium of Middle Eastern countries. The Physics 4993 students toured the completed building and observed the synchrotron con-

struction activities.

The University of Minnesota Physics 4993 students were generally very enthusiastic about their experiences in the Middle East. Many of the students said they travelled to the Middle East with several preconceptions, most of which were wrong. Many of the students expected to see obvious signs of political conflict, to experience some anti-Americanism and to observe countries that were clearly technologically less advanced than the United States. What they found instead was mostly normal life, fantastic hospitality and science and technology that were, in some cases, more advanced than that found in the United States. A majority of the students reported that the Physics 4993 class significantly changed their perception of the world and that they now looked forward to more visits to diverse places.

Marvin L. Marshak is a Professor of Physics and Director of Undergraduate Research at the University of Minnesota.





Physics in The Republic of Armenia

Ani Aprahamian

The republic of Armenia is located in the mountainous region of the Caucasus. In 1991, the people of Armenia were amongst the first to take advantage of the Gorbachev's reform movements to become an independent entity separate from the Soviet Union. The country is home to approximately 3 million Armenians with 99% literacy. Scientists in Armenia had distinguished themselves worldwide in their scientific accomplishments. Some of the most noteworthy facilities and institutions include the Observatory at Byurakan, the cosmic ray observatory on Mount Aragats (9000 ft. above sea level), the Yerevan Physics Institute, and the Armenian National Academy of Sciences.

Victor Ambartsumian who was also one of the founding members of the Armenian National Academies founded the Byurakan Astrophysical Observatory. Ambartsumian was the first to propose the existence of active galactic nuclei (AGN)¹. He was an elected or honorary member of 28 science academies around the world including the US, France, USSR, and others. Observations at Byurakan Observatory led to the identification of Markarian galaxies: a type of galaxy with unusually strong emissions at near-ultraviolet wavelengths. Astronomer Benjamin Eghishe Markarian first observed these in the 1960s.

The president of the Republic of Armenia established the **Victor Ambartsumian Prize** in 2009 to be awarded to outstanding scientists from any country and nationality having significant contributions in science. The Prize totals USD 500,000 and was awarded for the first time in 2010 to Prof. Michel Mayor (Observatory of Geneva, Switzerland) and his two team members for their important contributions to the study of the relationship between planetary systems and their host stars.

The Yerevan Physics Institute (YerPhi) is home to divisions of Accelerator physics, Experimental Physics, Theoretical Physics, Applied Physics, and Cosmic Ray physics. Armenia had the highest energy electron synchrotron (6 GeV) in the Soviet Union. With the construction of the CEBAF accelerator at 6 GeV at Thomas Jefferson National Laboratory in Newport News,

the team of physicists from Armenia became one of the most important external collaborating groups at that laboratory. Particle physicists from Armenia designed, tested and performed the commissioning of the TOF system for the OLYMPUS spectrometer at DESY and continue with the data analysis from the HERMES and H1 experiments. There are also robust groups from YerPhi on the CMS, ALICE, and ATLAS experiments located at the LHC. The groups from Armenia work on the construction, performance optimization, and calibration of various ATLAS and CMS systems.

In addition to JLAB, DESY, and CERN, the accelerator physicists from Armenia have also been collaborating in accelerator developments at various Russian Federation Institutes including SRIERA (St. Petersburg), JINR (DUBNA), MRTI, ANSALOO-VEI (Moscow).

The last few years, there was a global shortage of ⁹⁹Mo isotope for diagnostic and therapeutic procedures followed by a race to restoring a stable supply of this isotope by getting away from production of this radioisotope via highly enriched Uranium in reactors to using (gamma, n) reactions. Today, physicists at YerPhi are engaged in research and development efforts associated with better isotope production techniques. YerPhi has just completed negotiations with IBA of Belgium towards the purchase of a cyclotron, Cyclone 18/18. This is a first step to developing a center of radioisotope production, and research in nuclear medicine. Simultaneously, It is expected that two of the 18 MeV proton beams of this new accelerator can be used to jump start a research program in radioactive ion beams.

The Cosmic Ray Division (CRD)² of YerPhi is perhaps one of the most visible and active groups at YerPhi partly due to its energetic director (Ashot Chiligrarian). Cosmic Ray research in Armenia has a long and accomplished history beginning from the early 1940's. It is certainly one of the largest cosmic ray institutions in the world. The original aim of the CRD

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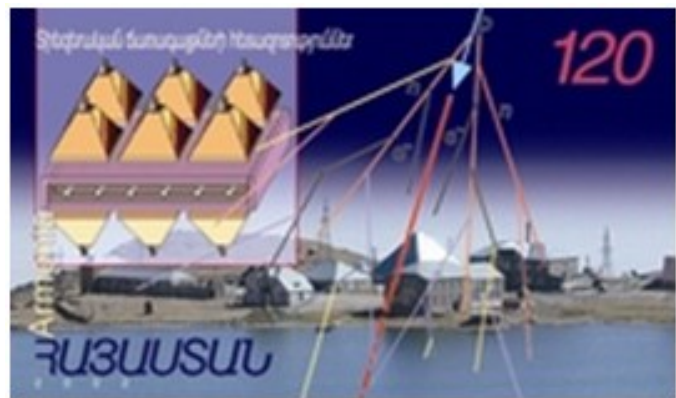
was in particle astrophysics, specifically, in studying the high-energy cosmic rays that bombard the earth. The construction of two research station sites at Nor Amberd (CRD-sites) on the slopes of Mount Aragats were amongst the first permanent high-mountain research stations built some 65 years ago³. There were early direct observations of cosmic rays made in Armenia that could not be made by satellites or balloons. Discoveries from Armenia were crucial to directly studying the particle fluxes of cosmic rays in the TeV-PeV energy region. Some of the significant past discoveries³ from the CRD include the measurements of the energy spectrum and charge ration of the horizontal muon flux and the measurements of cosmic ray spectra in the “knee” region (10^{14} - 10^{16} eV) of the cosmic ray spectrum using the MAKET-ANI, and GAMMA detectors in the 1980’s. The observatory on Mount Aragats was known for studying the origin and acceleration of high-energy cosmic rays but after 1991, the scarcity of resources with respect to detectors caused a shift of interest⁴.



Lightning storm detected from Mt. Aragats along with the direct observation of the secondary cosmic ray fluxes.

In 1994, the BATSE spectrometer flying on the Compton Gamma-Ray Observatory discovered terrestrial gamma-ray flashes (TGFs) - microsecond flashes of gamma rays. TGFs have been associated with lightning storms and potentially the creation of antimatter^{5,6}. At Mt. Aragats, the particle detectors were located just under thunderclouds allowing the measurement of the energy spectra of the electrons and gamma rays reaching the earth’s surface that resulted from particle avalanches produced in lightning storms. Recent research at Aragats established the symmetry between the meas-

ured thunderstorm ground enhancement events (TGEs) and the TGFs. This area of study has global implications since space weather and atmospheric high-energy phenomena are crucial to the operations of both space and earth-based technologies and climate studies. Ground based detectors observe space weather by predicting space storms tens of minutes before the arrival of energetic protons from the Sun and hours before the arrival of huge clouds of plasma ejected by the sun. The “Space Environment Viewing and Analysis Network” (SEVAN) of detectors have been deployed on Mount Aragats in Armenia, in Croatia, Bulgaria and most recently in New Delhi, India².



A 2003 Armenian postage stamp featured the role of this network of detectors to signal potential disruptions to space technologies.

After 1991, many of the scientific institutions in Armenia have experienced difficulties in re-establishing themselves and the ability to maintain or develop appropriate research infrastructure to continue doing forefront research at home in Armenia with reduced levels of financial support. Difficulties were maintaining the accelerator facilities, memberships in the international Astronomical union, the member fees at the LHC, as well as the update of the local research infrastructure and personnel.

In 2009, Professor Yuri Oganessian of the Flerov Laboratory of Nuclear Reactions in Dubna, Russia organized at the encouragement of the then minister of economy, Nerses Yeritsyan, an international committee of experts (InComEx) from the US, the UK, Germany, France, Bulgaria, Switzerland, and Russia to evaluate the scientific activities of YerPhi and to make recommendations to the government of Armenia regarding the future of the Yerevan Physics Institute. The InComEx group encouraged the government to support

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YerPhi and recognize it as a great national resource.



The photograph shows the meeting of Dr. Oganessian of Dubna with the President of Armenia Serzh Sargsyan. The outcome was the founding of a new national laboratory of Armenia! The name of the laboratory is Alikhanyan National Laboratory to recognize the original founders of YerPhi, Abraham Alikhanov and Artem Alikhanian. The budget of the laboratory has been doubled and enthusiastic activities continue.

In conclusion, the government of Armenia has realized the importance of science and new discoveries in creating an innovative economy and supports the new national laboratory of Armenia as a way to get there.

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Ani Aprahamian is the Frank M. Freimann Professor of Physics at the University of Notre Dame



News from the Canadian Association of Physicists August 2009 to December 2010

Robert Mann

The Canadian Association of Physicists, or CAP, is dedicated to the promotion of excellence in research and teaching of physics in Canada. Our office, which is located within the Physics Department at the University of Ottawa, is operating efficiently under the excellent leadership of our Executive Director, Francine Ford, along with the outstanding assistance of Office Manager, Lisa Ladouceur, and our part-time website coordinator and programmer, Shane Smith. The Executive and Membership of the CAP are most grateful for their continued efforts.

The past 18 months have very exciting for the CAP, with new milestones being reached in both physics research and teaching. The CAP submitted its first brief to the House of Commons Finance Committee (HCFC) under the leadership of its Science Policy Director, Paul Vincett, in August 2009. Our then-President, Robert Mann, appeared before the HCFC two months later to present the brief and answer questions. The 2010 Federal budget that was issued in March indicated that these lobbying efforts were successful. Research for basic science went up by \$22M, the first time in four budgets that money was allocated for untargetted research. TRIUMF's funding was renewed at \$44M, and several large-scale projects received infrastructure funding.

Important challenges still remain, perhaps the foremost of which is Canada's nuclear program. With Canada's existing multipurpose research reactor – the National Research Universal (NRU) reactor in Chalk River -- set to permanently close in 2016, Canada is at a crossroads as to the future of nuclear physics research and related disciplines. The NRU reactor is the source of neutron beams for materials research experiments conducted at the Canadian Neutron Beam Centre by about 200 researchers. It also produces the most commonly used medical isotope, Mo-99, for approximately 14 million medical diagnostic procedures annually worldwide. It is a platform for the irradiation of materials in “in-core” conditions to support Canada's fleet of nuclear power reactors. Our Division of Nuclear Physics, along with the Canadian Institute for Neutron Scattering, has been actively involved in working with the government to set both new policy and new funding for Canada's nuclear program. These efforts appear to be paying off: on November 24, 2010, the House of Commons

Standing Committee on Natural Resources published a report in Parliament recommending “That the Government of Canada study the feasibility of a new multipurpose research reactor in order to accurately estimate construction and operating costs as well as potential sources of income and report the results to Parliament”.

In terms of Physics Education, we successfully implemented a new Award for Excellence in High School Physics teaching (CEGEPs in Québec). Sponsored by six different companies and institutes, this award annually recognizes five excellent teachers (one in each of five regions in Canada) for their work in encouraging and developing tomorrow's physicists. Our first five awards for 2010 had a strong impact on both teachers and pupils alike. In the words of Robyn McKenzie, the winner from Atlantic Canada “I just wanted to thank you and CAP for the wonderful celebration we had today at Yarmouth High...it is something I will remember with pride for the rest of my life.”

The CAP became the first scientific society to become a founding member of Canada's new Science Media Centre, whose goal is to increase public engagement with science issues through media coverage of science that is more informed, more accurate and more incisive. Its users are expected to be non-specialized journalists, general assignment reporters, feature writers, editors, producers, and journalists specializing in science. We look forward to new and better opportunities to communicate the importance and the results of physics to the public at large.

We are also in the process of working with the Professional Engineers of Ontario (PEO) and 6 other Natural Science Societies to clarify the relationship between the practice of Natural Science and of Engineering, the intent being to exempt those natural scientists that are clearly not practicing professional engineering from the revised Professional Engineering Act in Ontario. A joint 15-member Task Force will report recommendations to PEO Council at its February 2011 meeting.

Our annual Congress, held in Toronto in June of 2010, was the largest in our history. Under the capable leadership of our Vice-President and Program Chair, Henry

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van Driel, participants were treated to plenary talks by outstanding scientists (including Nobel Laureate Charles Townes), dozens of parallel sessions, science policy sessions, student award competitions, and more. Planning is already well underway for our next Congress to be held at Memorial University in St. John's Newfoundland, in June 2011, under the direction of our current Vice-President and Program Chair, Mike Roney.

All indications are that the 2011 calendar year will bring its own exciting challenges and opportunities as we continue to advance the interests of Canadian physicists at all levels of their careers and in all fields. We look forward to this year with optimism and enthusiasm.

Robert Mann, Professional Physicist (P. Phys.) is a Professor at the University of Waterloo in Waterloo, Ontario and is Past-President of the Canadian Association of Physicists

Training European Scientists and Engineers to Manage Research Enterprises

William A. Barletta

In 2009 as part of my collaboration with Sincrotrone Trieste (ST) in its FERMI free electron laser project, I had an extended discussion with Professor Carlo Rizzuto, the President of ST, about training the young scientists at Trieste for future leadership roles at the laboratory. At the time Prof. Rizzuto was also Chairman of European Strategy Forum on Research Infrastructures (ESFRI). He confided that there was a great need throughout Europe for such systematic training for the forty-four research projects and enterprises on the ESFRI roadmap.

In response I shared with him the detailed outline of a three-credit course, "Managing Science in Research Laboratories," that I had recently presented at the US Particle Accelerator School session hosted by for a Master of Business Administration degree program aimed at European research managers. Coincidentally, during the same period and only an hour's drive away, the Faculty of Economics of Ljubljana Univ., which operates a European (EQUIS) and American (AACSB) accredited business school, was considering how to apply its abilities and resources to Slovenia's efforts to build its science and technology infrastructure.

Connections were made and later that year the Consortium of partners led by Ljubljana University was awarded European Union Funds to establish COBIK, the Centre of Excellence for Biosensors, Instrumentation and Process Control. An integral part of the COBIK program was to establish within the university framework a Masters of Business Administration in Research (MBAR). The MBAR *mission* is to provide European research managers, scientists, and engineers with top-notch business knowledge and skills specific to the research industry. The *vision* of the COBIK man-

agement and both partners in the program high technology company Instrumentation Technologies and the Faculty of Economics is by 2015 to establish MBAR as an internationally recognized business educational and training center for European research managers and scientists. The audience for MBAR are research managers from European public research institutes and private high technology companies (typical profile: technical experts with great managerial responsibilities but lacking in business training).

As a first step toward offering an accredited MBA in Research in 2012, COBIK offered the first mini-MBAR in February 2011. Mini-MBAR was established as an intensive (20 contact hours), one-module program offered to developers and researchers acting as or aspiring to become managers in their knowledge-intensive organizations. Mini-MBAR presented an enterprise view of research management that connects the strategic functions of the executive with the operational duties of line management. A similar session is planned for late spring in Trieste in collaboration with Sincrotrone Trieste and other Italian research organizations.

Also in the planning stage is the next management course to be offered by USPAS, this time with the possible collaboration of colleagues from Ljubljana. The winds of scientific exchange blow in both directions.

The author is Chair-elect of FIP, Director of the US Particle Accelerator School, and Visiting Professor in the Faculty of Economics of the University of Ljubljana.

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Thanks to Lidia Smentek for this nice collage of stamps honoring Madame Curie

