



Spring 2013 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

Sergio E. Ulloa

It is an honor and pleasure to welcome you to the spring 2013 Newsletter, as this year's Chair of the Forum on International Physics. Our Editor, Ernie Malamud, has prepared a great issue with articles from many a contributor and diverse points of view.

International Developments

FIP continues to promote and support the [International Travel Grant Award Program](#). With support from many units in APS and the invaluable leadership of the Office of International Affairs, the ITGAP program increased the number of awards in the most recent cycle last year from 3 to 5, thanks to additional financial contributions from FIP and APS. The number of meritorious proposals is high and more awards are certainly warranted. We are glad that this program continues strong and with excellent outcomes.

As you may know, APS is also in the midst of an expansion in the number of [International Councilors](#). The current two (of the planned four) are **Annick Suzor-Weiner** (French Embassy in Washington DC) and **Marcia Barbosa** (Universidade Federal do Rio Grande do Sul, UFRGS, in Brazil). We have extended invitations for them to join our FIP meetings whenever possible and offered our help in communicating with the FIP membership. We are very excited by these developments, as they strengthen the international mission of the APS. I urge you to heed the yearly call for nominations of new officers, including the election of a new International Councilor. It is important that we nominate excellent candidates to join those already elected and enhance the voice of international concerns within the APS Council.

Thank You and Welcome!

The start of the year brings new faces to the FIP Executive Committee. We welcome to the Chair-line, **Ed Berger** from Argonne National Laboratory, who is Vice-Chair in 2013 (and will continue on to be Chair-Elect, Chair and Past-chair in subsequent years). We are also glad to welcome two new Members-at-Large,

Christine Darve from the European Spallation Source, and **Alejandro de Lozanne** from the University of Texas at Austin; they will serve until December 2015. We look forward to their enthusiastic input in the Executive Committee.



FIP is also fortunate to have **Noemi Mirkin**, University of Michigan, re-elected as Secretary/Treasurer for another 3-year period. We are thankful for her years of excellent service carrying out the tasks performed in this position as well as overseeing the Forum's finances. We are glad she has agreed to continue providing this service.

I also want to thank the departing members of the Executive Committee for their efforts with FIP: Past Chair **Harvey Newman**, Caltech, and Members-at-Large **Giulia Pancheri**, INFN-Frascati, Italy, and **Alberto Santoro**, UERJ, Brazil. **Harvey Newman** has provided strong leadership and his enthusiastic efforts will be felt in the community for some time: He has spearheaded a fantastic effort to support travel of international students to meetings of the APS. The FIP membership will be hearing about this great pilot program in the near future.

Congratulations!

We are proud that **Sultana Nahar**, Ohio State University, has been recognized for her outstanding outreach efforts to scientists in third world countries, especially Muslim women. She is the 2013 recipient of the [John Wheatley Award](#) and will receive her recognition at the April Meeting in Denver. She will also present at that time a talk describing her work. We are glad that she is recognized for her strong efforts, which continue in the future as a Member-at-Large of FIP.

This Year

FIP has been active in organizing sessions for the 2013

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March and April Meetings. We have put together several interesting sessions on different aspects, all with a strong international flavor. Please find a description of these sessions elsewhere in the Newsletter. We hope to see you at these symposia and invite you to bring up proposals for sessions at future meetings. A short email to FIP Chair-Elect (and Program Chair) **Ercan Alp** (eea@aps.anl.gov) with your suggestions would be most welcome.

I look forward to a year of new efforts at FIP. I believe it is important that we listen to your ideas and concerns. A great opportunity to meet is at the upcoming FIP reception, which will take place during the 2013 March Meeting in Baltimore. Apart from meeting many FIP members, and the opportunity to congratulate some of the newly elected APS Fellows nominated by FIP, the reception gives us the opportunity to gather

with colleagues from several overseas physics groups who share many of our interests. Please see the announcement in this newsletter. We look forward to seeing you there!

For those not attending the March Meeting, I invite you to drop an email to me (ulloa@ohio.edu) or any of the Executive Committee members. We want to hear your ideas for initiatives, newsletter articles, or anything else in your mind. We look forward to hearing from you!

Sergio Ulloa is a Professor in condensed matter theory at Ohio University. His interests, apart from international affairs, include electronic transport and spintronics in nanometer scale structures. He is currently enjoying a sabbatical leave at the Dahlem Center for Complex Quantum Systems at the Freie Universität in Berlin.

APS Office of International Affairs

Amy Flatten

2012 brought exciting opportunities for the Society to expand its partnerships and develop new collaborations. I will take this opportunity to talk about a few of the highlights of our international activities over the past several months.

In September 2012, a delegation of APS leaders traveled to China for visits with universities, researchers, and institutes throughout China, Hong Kong, and Taiwan. Joining the trip were representatives from APS Headquarters, the APS Editorial office and members of the Committee on International Scientific Affairs (CISA). The Chinese Physical Society's (CPS) Annual Meeting in Guangzhou served as a cornerstone of the trip, with the APS Vice-President speaking at the first-

ever CPS-APS joint scientific session. (<http://www.aps.org/programs/international/conferences/cps2012.cfm>).

Throughout the trip, the participants endeavored to: 1) identify common areas of interest with Chinese counterparts; 2) establish key contacts; 3) discuss ways APS might beneficially partner with Chinese organizations and insti-



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tutions; and 4) explore activities to connect and serve our collective physics communities. The group met with representatives from the Institute of Physics, Chinese Academy of Sciences, the Kavli Institute for Theoretical Physics China (KITCP) and visited physics departments of major universities¹. The APS leaders will review and refine some of the common interests discussed during the meetings with the intention of developing new collaborations and strengthened connections with the Chinese physics community.

This past year, the APS continued its partnerships with the Indo-U.S. Science and Technology Forum (IUSSTF) and the Sociedade Brasileira de Física (SBF) to offer the Brazil and India Physics Student and Professor Exchange Programs. These Physics Student Exchange Programs offered graduate students opportunities to attend a short-course or summer institute in another country, or work overseas with a professor in his/her field of study. The Professorship/Lectureship Exchange Programs funded physicists wishing to teach a short course or deliver a lecture series in the other country. We thank the Forum on International Physics for helping to advertise these opportunities!

In partnership with the UK Institute of Physics (IoP) and the Abdu Salam International Centre for Theoretical Physics (ICTP), the Society continues to co-sponsor workshops designed for physicists and engineers from developing countries who are interested in learning entrepreneurial skills, as such an educational program is missing in many of the developing countries. This past year, we co-sponsored workshops in Ethiopia and at the International Centre for Theoretical Physics.

The APS renewed its partnership with the European Physical Society (EPS), the UK Institute of Physics (IoP), and the German Physical Society (DPG) to continue the SESAME Travel Award Program that supports training opportunities for scientists in the Middle East. The SESAME project--the synchrotron light source in Amman, Jordan, brings together physicists from Arab countries and Israel for international scientific collaboration.

The Society continues to bring international physicists to speak at APS meetings through both the Marshak and Beller Lectureships, which support distinguished physicists from the developed and developing countries respectively. The Society also continued its ongoing commitment to developing country physicists through its International Travel Grant Award Program (ITGAP), which supports developing scientists' travel to visit collaborators in developed countries. The Forum on International Physics launched this program and it now enjoys the financial support from nearly every scientific Division of the APS!

The Society continued its collaboration with 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, the APS stressed the need for scientific organizations to advocate for the human rights of scientists in the U.S. and around the world.

The above are just a few highlights of the past year, and as many of you may know, the recently completed APS Strategic Plan identified "expanding the Society's international engagement," as a key priority. Consequently, I am extremely enthusiastic about the upcoming year and especially want to thank the members of FIP, as you have been partners in many of the aforementioned efforts to build new programs that serve APS members, and provide new opportunities for physicists worldwide.

1. Nanjing University, Fudan University, Shanghai Jiao Tong, Hong Kong University of Science & Technology, Chinese University of Hong Kong, and National Taiwan University

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

From the Editor

Ernie Malamud

In this issue are contributions from many different parts of the globe. I thank all of the authors for their contributions as well as our Newsletter Committee for their excellent suggestions

From early in my career my personal philosophy has been to recognize the importance of dialog between scientists in different countries, often between countries in conflict. Of course, the shining examples are CERN and now SESAME. So in this issue, besides links to an interesting article and some BBC coverage on SESAME, I've included a Memoire by a Russian colleague and friend from the early days at Fermilab. In the midst of the cold war Nikitin and I convinced our Director Bob Wilson to approve us for the first experiment done on the new accelerator. Also relating to science history and internationalism is the account by Lidia Smentek of the Judd-Ofelt Theory of f-Elements.

A significant contribution to scientific advances and international connections is the role played by expatriate groups and organizations of physicists working in the United States. This issue features articles by 4 groups – from Korea, China, Iran and Ethiopia.

Forum: Public medium used for debates in which anyone can participate. In Roman times it meant a public place at the center of a market or town where open discussions on judicial, political, and other issues were held. I include this definition with the goal of encouraging discussion among our membership in Letters to the Editor. In this issue a Letter to the Editor from Alan Cooper describes the nuclear reactor program in the UK to compare with that in Sweden described in our last issue by František Janouch.

I encourage FIP members to suggest topics and authors for future issues. The deadline for receipt of materials for the fall 2013 issue is August 15. Please send material in MSword format and graphical material as JPGs. It also helps if you are covering more than one topic in an article to divide the material into several shorter articles.

Ernie Malamud spent three decades at Fermilab participating in high energy physics experiments and accelerator design and construction. He is a Fermilab Scientist Emeritus and is on the adjunct faculty at the University of Nevada, Reno. He is the Editor of the DPB brochure "Accelerators and Beams, Tools of Discovery and Innovation." Copies of the recently completed 4th edition are available by writing to malamud@foothill.net.

FIP RECEPTION TUESDAY, MARCH 19, 2013 6-8 PM Pickersgill Room - Hilton Baltimore

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 the 2012 FIP APS Fellows! Co-sponsors will also 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!

FIP Sessions at APS Spring Meetings

Sergio Ulloa, 2012 FIP Program Chair

March Meeting 2013

**March 18 - 22 • Baltimore Convention Center,
Baltimore, Maryland**

FIP has sponsored and co-sponsored three great symposia.



Session B9 – Monday, March 18 - 11:15AM - Room 308. **FIP Symposium on the Science of Climate.** Chaired by Eugene Chudnovsky, CUNY-Lehman, this symposium brings together experts on different aspects of the science of climate. They will present current developments on our understanding of this fascinating and important field: From the connection of earth climate with solar variability, to climate in other planets, the speakers will also address the role of ozone on the Earth's climate system, and our progress in predicting monsoons. All in all, this symposium will allow us to properly frame the discussion on climate, in great anticipation of the symposia later in the week on related topics organized by the Topical Group on the Physics of Climate (GPC; sessions N4, T16 and U15). Moreover, the Kavli Plenary Session on Wednesday (R0) will also include talks on climate.

Richard Lindzen, "Climate Concerns: Asking the Right Questions"

Joanna Haigh, "Solar Variability and Climate Change"

Bhupendra Nath Goswami, "On Winning the Race for Predicting the Indian Summer Monsoon Rainfall"

L.M. Polvani, "Stratospheric ozone: a major (long neglected) anthropogenic forcing of the climate system"

Francois Forget, "Climate of Mars and Other Planets"

Session N32 – Wednesday, March 20 - 11:15AM - Room 340. **International Physics Programs and History of Physics.** Jointly sponsored by FIP and the Forum on the History of Physics (FHP), this session will be chaired by Gloria Lubkin, Physics Today Editor. The symposium will feature Fulbright opportunities in the physical sciences, as well as a fascinating collection of historical talks from Bohr's Atom 100th anniversary to the discovery and development of X-ray diffraction, to the marvelous year 1932, when Urey discovered deuterium and Chadwick the neutron, as well as several other important advances that same year!

Katrin DeWindt, "Fulbright Opportunities in the Physical Sciences"

Ernst Wall, "Revisiting the Bohr Atom 100 Years Later"

Charles W. Clark, Joseph Reader, "A transformational year in physics: 1932"

Yeuncheol Jeong, Ming Yin, Timir Datta, "Discovery and development of x-ray diffraction"

Amy Young, "Latest developments on documentary film - The State of the Unit: The Kilogram"

Session R9 - Wednesday March 20 - 2:30PM - Room 308. **Advances in Condensed Matter Physics in Latin America.** Chaired by Eugenio Vogel, Universidad de La Frontera, Chile, this symposium features prominent speakers from Latin American countries with strong programs in condensed matter physics. The expert speakers will discuss progress, investments and future plans in Argentina, Brazil, and Mexico. Moreover, the session will include a discussion of the important role that the Center of Latin American Physics (CLAF) has played in the region in its 50 years of existence, and examine the progress and status of women in Latin American Physics.

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Elisa Maria Baggio Saitovitch, "CLAF: 50 Years of Promotion and Coordination of Physics in Latin America"

Lilia Meza-Montes, "Marshak Lectureship: Women in Physics: Increasing in Number, and What Else?"

Antonio Jose Roque da Silva, "Brazilian Synchrotron Light Source: current results and future perspectives"

Carlos A. Balseiro, "Physics in Argentina: The Case of Nanoscience and Nanotechnology"

Romeo de Coss, "Condensed Matter Physics in Mexico"

April Meeting 2013

April 13 - 16 • Sheraton Denver Downtown Hotel, Denver, CO

FIP has co-organized two symposia on different aspects of Science Diplomacy.

Session H7 – Sunday, April 14 - 10:45AM - Governor's Square 16. **Science Diplomacy.** The session has been co-organized with the Forum on Graduate Student Affairs (FGSA). Chaired by FIP Past Chair Harvey Newman, Caltech, the symposium will give a high perspective glimpse of what science diplomacy can achieve from within state institutions: the Science Ministry in Brazil and the US State Department.

Marco A. Raupp, "Science in Brazil"

Nicholas Suntzeff, "Science Foreign Policy at the State Department: Why Would They Need a Cosmologist?"

E. William Colglazier, "Science and Diplomacy"

Session R6 – Monday, April 15 - 1:30PM - Governor's Square 16. **Session on Grassroots Science.** This symposium, chaired by William Barletta, Massachusetts Institute of Technology, features the presentation by this year's John Wheatley Award recipient, Sultana Nahar, on her work promoting underrepresented scientists in Asian and Arab countries. Other speakers will discuss the important international aspects of large facilities, such as particle accelerators and especially SESAME, the synchrotron light source in Jordan.

Sultana Nahar, "John Wheatley Award Talk: Promoting Under-Represented Physicists in Asian and Arab Countries and Muslim Women in Science"

Andrew Sessler, "International Aspects of Particle Accelerators"

Hamed Tarawneh, "Status of SESAME Synchrotron Light Source"



International Engagement, Retreat and Task Force

From Kate Kirby, APS Executive Officer

"International engagement and serving our international members more effectively are high priority objectives in the APS Strategic Plan. In order to gain first-hand knowledge of some of the issues and interests of APS members living outside the United States, Amy Flatten and I traveled to China this past September to have round-table discussions with Chinese physicists at a number of universities and institutes. It is clear that APS journals and meetings are greatly valued by the Chinese community of physicists, and we took away many ideas to help guide our future activities in support of greater contact and collaboration between the Chinese and American physics communities. The topic of international engagement will be a focus of the APS Executive Board Retreat in June, and in the fall of 2013 we will be forming a Task Force on International Engagement to identify opportunities and make recommendations for increasing APS's profile and involvement in the global physics community."

Newly Elected to the FIP Executive Committee

Compiled by E. Malamud from excerpts from the candidate bios and statements



Ed Berger, Christine Darve,
Alex de Lozanne, Noemi Mirkin

Edmond L Berger, Distinguished Fellow at Argonne National Laboratory was elected to Vice – Chair and the 4-year Chair Line term beginning in January 1 of this year.

Ed Berger is an elementary particle theorist in the High Energy Physics Division of Argonne National Laboratory. He earned an undergraduate degree in Physics from MIT and a PhD from Princeton University. Berger has served as a member of the High Energy Physics Advisory Panel and on several DOE review committees, on the Fermilab Physics Advisory Committee, and on the Brookhaven High Energy and Nuclear Physics Advisory Committee. He was elected twice to the Executive Committee of the APS Division of Particles and Fields, serving as Chair of the Executive Committee in 1990. He has been very active in the organization of major international meetings.

Berger eloquently states. “As members of the Forum on International Physics of the American Physical Society, we are self-selected individuals brought together by our special interest and experience in international relations among physicists. Born and educated in diverse nations, we have worked and traveled elsewhere and may well make our contributions in societies far from our original homelands. We are bound by our appreciation of the open culture of the scientific enterprise, and we want to “give back” by facilitating scientific opportunities for aspiring students in regions not yet fully represented in the field.”

Berger is concerned with access and sharing of unique physics facilities, and also feels that FIP can be proactive in the transfer of more facilities to developing nations, and in the organization of appropriate workshops and summer schools, partnering with educational and philanthropic organizations who share the goal of fostering the growth of science and technology in under-represented regions.

The two new Members-at-Large on the 13-person FIP Executive Committee are Christine Darve and Alex de Lozanne. Their 3-year terms began on January 1 of this year.

Christine Darve is an Engineering Scientist at the European Spallation Source in Lund, Sweden. She specializes in accelerator physics. Darve graduated from the *Institut Polytechnique de Sevenans* (France) in 1996 and after a decade of experience in the field of cold temperatures she obtained her Ph.D. at Northwestern University (Illinois) on the topic of the superfluidity of helium. Darve has been involved in schools and workshops to promote science without barriers, academic freedom and human rights. She has been the main organizer of the *African School on Fundamental Physics and its Applications* (ASP). The mission of this bi-annual 3-weeks school is to build expertise in the least developed countries and to increase proficiency in applied science and technology. Darve has developed

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strong connections with international physics institutes and African Universities to continue her efforts in bringing science and technology to the reach of African students and young scientists.

As a Member-at-Large Darve will organize events which foster international science. Since early in her career Darve has been an advocate of improving international collaborations. She was the executive secretary of Physics Without Borders and supported the establishment of a summer school in Sarajevo, where 100 students from the Balkan area discovered the use of the World Wide Web. Her future goals are to encourage programs with diversity and promote science and society without barriers.

Alejandro (Alex) de Lozanne is a professor in the Department of Physics at the University of Texas at Austin, where he has been a faculty member since 1985. Previously he held a junior faculty position in the Department of Applied Physics at Stanford University after receiving a Ph.D. degree in Physics from that institution in 1982.

De Lozanne studies magnetism, superconductivity and nanostructures, using low temperature scanning probe techniques that he has developed. He has published two patents and 130 papers or book chapters on these topics. His research has been recognized with several fellowships and a 1986 Presidential Young Investigator Award. He was born in Sonora, Mexico, and grew up in Mexico City.

De Lozanne is concerned with dwindling resources and his perception that interest in physics among young people seems to be waning. As a Member-at-Large he wants to explore new ways to carry out the objective of the FIP to promote “the advancement and diffusion of the knowledge of physics by fostering communication and mutual understanding among physicists of all countries.” He would like to explore the possibility of fostering exchanges via the internet. Some subfields, like experimental high energy physics, have plenty of experience in communicating with large groups of collaborators across the globe. Perhaps FIP can host and promote similar collaborations in other subfields.

Noemi Mirkin continues for another 3-year term as our Secretary-Treasurer.

The Secretary-Treasurer in APS units is the person most responsible for the smooth running of the unit, and provides continuity as the Chair changes annually. FIP has benefitted enormously from having Mirkin as our Secretary-Treasurer and we are indeed fortunate that she is willing to continue in that role.

Noemi Mirkin was born in Buenos Aires, Argentina and received her Licenciado degree in Physics from the National University of Tucuman in 1973 and her Ph.D. in Physics from the University of Michigan in 1989. Mirkin's research has been in the general area of vibrational spectroscopic studies of peptide and protein structure and have included a variety of topics in experimental infrared and Raman spectroscopy; vibrational analysis; surface enhanced Raman spectroscopy; quantum chemical studies of structures, energies and force fields of macromolecules; the development of physically reliable molecular mechanics energy functions to be used in the modeling of biomolecules.

She has been deeply involved with multiple organizations in activities geared to increasing the participation of women and minorities in science and engineering. She was awarded the University of Michigan's Sarah Goddard Power Award for scholarship, leadership and sustained service on behalf of women. She served as member and then Chair of the APS Committee on the International Freedom of Scientists.

Mirkin feels that FIP's greatest opportunity and challenge is to increase our membership base. “To remain a healthy organization we not only need to recruit more members, but also to increase member participation at all levels. In addition, we need to strengthen the communication between the FIP Executive Committee and the FIP members; our members need to know what our organization is doing and how it affects them. It is important for the FIP to maintain a strong presence in matters of international issues. We must represent and bring to the forefront the interests of the foreign members of the APS. In this ever-changing world environment, the FIP has the opportunity to play a unique lead-

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ership role towards enhancing international cooperation in scientific research and technological development. Critical issues at this time are the barriers to the free flow of information and communication with international scientists. We must be aware, vigilant and proac-

tive in maintaining these freedoms.” Mirkin will continue to work for the FIP in its efforts to provide a forum that supports and encourages scientific interactions in the international community.

Stanford Symposium Highlights Herman Winick’s Many Achievements in International Physics *Summary by Ernie Malamud*

I had the good fortune to be able to attend the all-day symposium honoring Herman Winick’s 80th birthday. <http://ssrl.slac.stanford.edu/conferences/workshops/herman-winick-80/> Distinguished speakers highlighted different aspects of Winick’s career and detailed his many pivotal contributions in accelerator physics and specifically in electron storage rings and synchrotron radiation light sources, not only at SLAC but in installations worldwide.

Equally important as Winick’s advances in accelerator physics are his notable accomplishments in International Physics and human rights. Following is a brief outline of three talks devoted to these aspects of Winick’s career. I invite FIP members to look at these talks themselves:

Andrew M. Sessler “Herman Winick Celebration Human Rights and International Activities” <http://ssrl.slac.stanford.edu/conferences/workshops/herman-winick-80/documents/andrewsessler.pdf>

Efim Gluskin “Russian and Midwestern Connections” <http://ssrl.slac.stanford.edu/conferences/workshops/herman-winick-80/documents/efimgluskin.pdf>

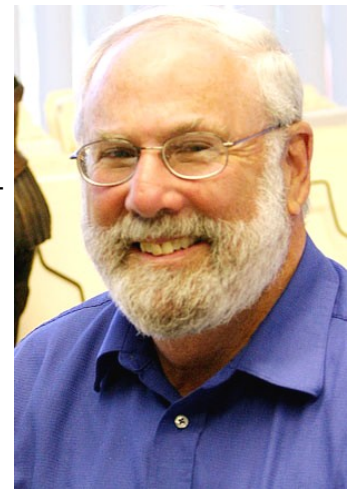
Soichi Wakatsuki “Asian Connections” <http://ssrl.slac.stanford.edu/conferences/workshops/herman-winick-80/documents/soichiwakatsuki.pptx>

Sessler described Winick’s contributions and leadership in four organizations: the APS Forum on International Physics (FIP), the APS Committee on the International Freedom of Scientists (CIFS), Scholars at Risk, and the Institute of International Education. Her-

man was FIP Chair in 2007 and currently is Councillor for FIP on the APS Council. He chaired CIFS in 1992 and continues to this day to actively involve himself in critical human rights cases in many different countries.

The creation of SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East) by Herman and Gus Voss in 1997 is a major triumph in international physics. Note the remarkable membership list: Bahrain, Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, the Palestinian Authority and Turkey. This advanced synchrotron will serve a wide spectrum of disciplines, ranging from biology and medical sciences through materials science, physics and chemistry to archeology. This research facility in the Middle East is modeled on CERN, is under the umbrella of UNESCO, and uses science to promote understanding and peace between different countries with different religions and ethnicities.

Gluskin and both showed us wonderful slide shows of photographs of Winick’s worldwide travels as he helped scientists in many countries create synchrotron light sources in many parts of the world as well as be instrumental in the development of proposals for new facilities: Novosibirsk, Armenia, Russia, Taiwan, Japan, China, Thailand, Australia and Africa.



Sultana Nahar, FIP Executive Committee Member, Winner of the John Wheatley Award

Citation: *"For efforts to promote physics research and teaching through collaboration, mentoring, and philanthropy in several third-world countries, and in particular for her promotion, as both an advocate and role model, of Muslim women scientists."*

Sultana, a faculty member at Ohio State University, contributes frequently to this newsletter. See her article on this issue "**Recent Visit to Bangladesh Universities and Physics Prizes**, and in recent past issues: **Egypt Connection** (Fall 2012) and **Highlights of a trip to the UAE and India** (Spring 2012)



The Wheatley award was established in 1991 with the support of the Forum on International Physics and is endowed by gifts from Biomagnetic Technologies and IBM, and by individual donations in memory of John Wheatley. The award is given to a physicist, generally from a developed country, who, at personal or professional cost, goes to a less developed country and promotes significant physics there, as John Wheatley did in Argentina.

FIP Members Recognized as APS Fellows

It is a pleasure to recognize and congratulate eleven of our members who have recently been elected to APS Fellowship upon nomination by the FIP for their significant contributions to physics and the advancement of physics throughout the world.



Maria Allegrini, University of Pisa

Citation: For contributions to laser interactions with atoms and small molecules: energy pooling collisions, high resolution spectroscopy, laser cooling of diatomic molecules, and contributions to international physics through collaborations and professional service

Emanuela Barzi, Fermilab

Citation: For her innovations in the development of advanced superconductors, her continuous efforts in promoting International scientific collaborations, and her unwavering mentoring of US and Italian students

Bhanu Das, Indian Institute of Science

Citation: For his seminal contributions to the theory of parity and time-reversal violations in atoms in the context of probing the Standard Model of particle physics, and for his leadership in promoting international collaborations in frontier areas of atomic, molecular and optical physics

Dino Fiorani, Consiglio Nazionale delle Ricerche - Istituto di Struttura della Materia, Rome

Citation: For his contribution to the physics of nanostructured materials and his contribution to the international aspect of physics through organization of international science meetings

Kui-juan Jin, Institute of Physics, Chinese Academy of Sciences

Professor Jin was cited for her significant contributions in the overlapping areas of optics and condensed matter physics, and for her important role as a leading example for women in physics.

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Derun Li, Lawrence Berkeley National Laboratory

Citation: For his tireless efforts to promote collaboration and cooperation on accelerator science and technology between the US and China and for his work towards the experimental demonstration of muon ionization cooling

Li Lu, Chinese Academy of Science

Citation: For contributions to experimental studies of mesoscopic and nanoscale electronic materials, and for leadership in promoting international scientific collaborations

Jie Meng, Peking University

Citation: For his many important and continuing contributions in developing the Relativistic Mean Field theory into a predictive tool for nuclear structure research and for creating an active international hub at Beijing in this field

Steve Myers, CERN

Citation: For his important contributions to the physics of beams and his exceptional efforts to shape international collaborations enabling successful physics programs at the ISR, LEP and LHC

Sergey Saveliev, Loughborough University

Citation: For distinguished contributions to the theory of classical and quantum transport, particularly for the application of stochastic methods to solid state physics, including superconducting Terahertz electronics, vortex dynamics and nanoparticle transport

Mu Wang, Nanjing University

Citation: For his original contributions in understanding nonlinear phenomena in crystallization, exploration of opto-electric properties of self-organized metallic microstructures, and his tireless efforts in promoting international scientific exchange and collaboration.



Letter to the Editor

The Future of Reactors in Britain *Alan Cooper*

It was interesting to read the article by František Janouch on the recent revitalization of the Swedish reactor program, “**The Time of Green Delusion in Sweden is Over**” (Forum on International Physics Newsletter, Fall 2012) and then compare it with the current situation in Britain where incidentally the (National) Meteorological Office recently admitted that there had been no detectable temperature rise in the UK over the last 15 years. In the late 1950s Britain was a leader in the development of reactors. At the peak in 1997 British reactors supplied 26 % of electrical power. This has declined since then as aging reactors were shut down and new ones not constructed. The difference between the government’s handling of nuclear energy and its handling of wind energy could not be starker. Wind turbines are underwritten and heavily subsidized. EDF (Électricité de France) began to press for government guarantees, something which the British government will not even discuss. EDF is one of the last companies to retain an interest in investing in nuclear energy in Britain; several others have already pulled out. Projecting 5 years into the future, it seems almost impossible for Britain to have an adequate and reliable generation of electricity.

The general public do not have a good understanding of nuclear energy, hardly surprising since the features are complex. They naturally fear what they do not understand. However, whichever comparisons you make, nuclear energy is relatively safe. And yet the British government allows irrational public fears to derail its energy policy. A proper campaign of education should perhaps start with the axiom that what a country needs is a steady and reliable source of energy, which is best done with a lot of modest size power stations near cities. That can be done with relatively small nuclear power stations but not with coal fired stations nor wind turbines. This ideal solution is not considered because “the public would not like it”. So through failure to educate the public on a simple point we get seriously wrong decisions.

Looking further in the future, new concepts are needed, especially considering that uranium ores will begin to run out. Most technically developed countries now realize that fast reactors will be essential. When Fermi controlled the first reactors in Chicago with control rods on ropes the idea of fast reactors was frightening. Now it is not. Fast reactors use all the neutrons produced in fission. The faster neutrons can use a wider range of reactions, and there are more neutrons available so that neutron absorbing fission products are less of a problem - they can be burnt up. The neutron surplus also means that the vast stocks of depleted uranium or nuclear waste are possible fuels.

A longer term solution is called an “energy multiplier.” A subcritical assembly fuelled with relatively plentiful thorium or nuclear waste is driven by injecting fast neutrons from accelerated protons striking a heavy metal target. Typical design values are a few hundred MeV with a current of several milliamps. 20 MW input from such an accelerator could produce 500 MW from a thorium assembly. The average UK total electrical power requirement is about 12,000 MW.

Choices will be difficult. Who will make them? Simple democratic methods are obviously useless; no popular vote could possibly be well enough informed. Politicians with a science background are rare. Energy policy has been aimless and rudderless for several decades in Britain. It is time for the British government to lead the process to create a clear and logical policy for the energy future.

Dr Alan Cooper did nuclear physics research at Harwell, CERN, and Argonne National Laboratory. He joined the Physics Department of the Open University in Milton Keynes, UK in 1971 and is now retired.

SESAME Update: Recent Article and Media Coverage

The following will be of interest to our members:

November 16, 2012. Chris Llewellyn Smith “Synchrotron Light and the Middle East, Bringing the Region’s Scientific Communities Together through SESAME”

<http://www.sciencediplomacy.org/perspective/2012/synchrotron-light-and-middle-east>

November 26, 2012. BBC News article “Inside the world’s most ‘impossible’ science project

<http://www.bbc.co.uk/news/science-environment-20446971>

Nov. 26, 2012. BBC VIDEO. “Middle East scientists on new Sesame particle accelerator”

(individual scientists from different member countries)

<http://www.bbc.co.uk/news/science-environment-20465431>

Nov. 26, 2012. BBC VIDEO. “A Look at the Middle East “CERN”

(views of the installation at that time)

<http://www.bbc.co.uk/news/science-environment-20465428>

The AAAS Science and Human Rights Coalition

Juan Gallardo and Michele Irwin

In 2009, the Science and Human Rights Coalition was established under the auspices of the American Association for the Advancement of Science (AAAS). The Science and Human Rights Coalition is a network of scientific and engineering organizations in the United States that share the belief that science and scientists have an important role to play in the realization of human rights for all people. (<http://shr.aaas.org/coalition>)

The Coalition strives to promote communication and knowledge about human rights among scientific organizations as well as between the human rights and scientific communities. Scientific societies and associations as well as individual scientists come together to learn about human rights in general, and more specifically, learn how human rights influence their science and what fellow scientists are doing to advance those rights. Coalition members also discover what science—what scientific knowledge and scientists’ voices—can offer to human rights practitioners and the human rights community.

To facilitate this communication and knowledge, the Coalition is comprised of five working groups that

carry out activities related to 1) the Welfare of Scientists, 2) Science Ethics and Human Rights, 3) Service to the STEM Community, 4) Service to the Human Rights Community, and 5) Education and Information Resources—that promote collaboration between the science and human rights practitioners. It is within this framework where the bulk of the Coalition’s work is done. Here, scientists organize workshops on the intersection of human rights and science, they compile syllabi for teaching modules on science and human rights, and they develop resources to train scientific associations about their role in addressing human rights. The list of activities undertaken by these working groups is impressive and demonstrates the breadth and significance of the relationship between human rights and science.

The Coalition also engages in an over-arching initiative that reinforces the efforts of these working groups. In 2007, the United Nations began a process to define Article 15 of the International Covenant on Economic, Social and Cultural Rights (ICESCR)

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(<http://www2.ohchr.org/english/law/cescr.htm#art15>), which states, in part, that everyone has the right to “enjoy the benefits of scientific progress and its applications.” The Coalition initiative promotes awareness of and knowledge about this right, but it also is actively seeking to shape how this right is defined. When the UN began its process of defining this right, it did so without significant input from the scientific community. Thus, the Coalition has committed itself to ensure that the voices of the scientific community are heard and represented.

As part of this effort, the Coalition’s Service to the STEM Community Working Group organized focus group discussions with Coalition member organizations to ask scientists from a broad cross-section of scientific disciplines about their views on the definition this right. *What, precisely, does this right mean to you as a scientist? Does it mean something different to physicists, ecologists, chemists and psychologists? What specific knowledge can scientists bring to the definition of the right?* Information from those focus groups will be used to inform the UN process to define the right and guarantee that the voices of scientists from a wide range of disciplines are represented. (Readers who are interested in the UN process can learn more by reading a May 2012 report to the UN Human Rights Council from the Special Rapporteur in the field of cultural rights: http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session20/A-HRC-20-26_en.pdf.)

In addition to these activities, the Coalition meets twice a year, with each meeting focusing on a specific theme that demonstrates the connections between human rights and science. In July 2012, (<http://shr.aaas.org/coalition/Meetings/2012/July/index.shtml/>), the theme was about how human rights intersect with the technological applications of science and engineering such as the use of modern equipments for detection and monitoring of physical and biological properties, computer and information science, and innovative techniques that have positive impact on facilitating access to medicine, clean water, pollution control, and education.

These opportunities for the use of technologies to address grave human rights concerns is interconnected with an issue that the Coalition works to address as well, i.e., the professional responsibility of scientists and engineers toward our fellow human beings and human rights.

More recently, on January 31 – February 1, the Coalition meeting focused on the intersections among children’s rights, science and technology. Participants learned about the rights of children as set out in international declarations and treaties as well as issues on which science and technology could impact important children’s rights concerns.

The American Physical Society has been an active member of the Coalition since its inception and was also active in the efforts that went into the establishment of the Coalition. As most FIP members know, human rights have played a prominent role in the Society, whether through the APS Committee on International Freedom of Scientists (CIFS), the APS Andrei Sakharov Prize, or the various statements that APS has made that have addressed specific rights concerns. Maybe more importantly, on November 15, 1998, the APS Council adopted a statement declaring “...its support for the rights and freedoms in the Universal Declaration of Human Rights for all people, everywhere.” This solidified the Society’s commitment to human rights and emphasized the awareness that science—physics—and human rights are interconnected.

Given the Society’s historical commitment to human rights, specifically with respect to the defense of the rights of individual scientists by CIFS, APS has been active in the Coalition’s Working Group on the Welfare of Scientists. The mission of this working group is to demonstrate to the scientific community the value of and necessity for scientific organizations to defend the rights of their members and fellow scientists and to advocate for them when needed. The working group aims to increase the effectiveness of organizations in the defense of the rights of scientists.

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In support of the Article 15 initiative, APS joined other scientific societies and associations by hosting a focus group of APS members to help define the right to benefit from scientific progress and its applications. In November 2012, several APS members participated in this event to obtain physicists' views on the definition of Article 15. Information from that focus group will feed into the Coalition's report to the United Nations Committee on Economic, Social and Cultural Rights this year that will bring the voices of the scientific community to bear on the UN's effort to define this right.

Human rights are fundamental entitlements of all human beings. These rights are guaranteed by law as spelled out in the **Universal Declaration of Human Rights**, which was adopted by the United Nations as a non-binding resolution in 1948 (<http://www.un.org/en/documents/udhr/>) and subsequently affirmed by two binding covenants in 1966, i.e., **the International Covenant on Economic, Social and Cultural Rights**, and **the International Covenant on Civil and Political Rights**. The AAAS Science and Human Rights Coalition recognizes that the scientific community has

an important and unique role to play in the realization of these rights. APS is proud to be a part of this effort.

We invite all FIP members interested in learning more about the intersection of human rights and science to attend the next Coalition meeting in Washington D.C. on July 11-12, 2013. Come meet with fellow scientists from a wide spectrum of disciplines and learn about how your research and work contribute (or can contribute) to the realization of human rights. For more information contact one of us.

Juan Gallardo, gallardo@bnl.gov, is retired from the Advanced Accelerator Group, Brookhaven National Laboratory. He has served on the APS Committee on International Freedom of Scientists (CIFS), including as Chair in 2007. In addition, he has been a member of the APS Andrei Sakharov Prize Selection Committee. Michele Irwin, irwin@aps.org, is the International Programs Administrator at APS where she works closely with CIFS. Both represent APS at the AAAS Science and Human Rights Coalition and serve on the

Association of Korean Physicists in America (AKPA) *Eun-Suk Seo*

The Association of Korean Physicists in America (AKPA) has been serving both Korean and American communities by promoting technical excellence, US-Korea cooperation, and professional networking since its birth in 1979. I have been privileged to serve as the 29th President of AKPA for the last two years. During my term, we organized numerous meetings including the US-Korea workshop as part of the Korean Physical Society (KPS) 60th anniversary celebration, and physics sessions with record-setting attendance at the US-Korea Conference on Science, Technology and Entrepreneurship (UKC 2012). The "US-Korea Workshop: International Cooperation on Particle, Nuclear and Astrophysics Research" was held in Daejeon, Korea, April 24-25, 2012. This workshop was organized jointly by AKPA and the Korean Physical Society (KPS) in commemoration of the 60th anniversary of the KPS.

We hope our strong collaboration between AKPA and KPS will lead to many productive collaborative projects between Korea and the US. Distinguished US speakers representing their research fields included Professors B. Barish, H. Gao, V. Jones, W. Lynch, M. Peskin, R. Tribble, and P. Yoon. In addition, two former Presidents of AKPA, Professors C. R. Ji and K. H. Kim, President Elect and VP Professor J. Yu, Treasurer Dr. T. Shin, and Chair of the Publicity and Editorial Committee, Professor S. W. Lee, former Auditor, Dr. P. N. Seo, and young researchers Drs. S. Park, N. Hong, and H. Na made presentations either at the workshop or at the KPS General Meeting. We are most grateful for the travel support provided by the National Science Foundation (NSF). I would like to thank the KPS led by President S. C. Shin for being a gracious host and for providing warm hospitality during our stay.

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The Memorandum of Understanding (MOU) between the KPS and the American Physical Society (APS) to strengthen the collaboration and communication between the two organizations was a highlight of the KPS 60th anniversary celebration. AKPA helped facilitate this MOU, which promotes scientific exchanges between physicists from Korea and the US. The APS Office of International Affairs, along with the Committee on International Scientific Affairs (CISA), will collaborate closely with AKPA to facilitate other suitable joint activities.

We also organized Korean physicist symposia at American Physical Society (APS) meetings, including the March and April meetings, and Annual meeting of the Division of Plasma Physics. We successfully launched a pilot program, the National High School Physics Contest, during the National Mathematics and Science Competition (NMSC 2012) in North Texas and North Carolina. We published newsletters quarterly, with a new design to improve the appearance. Recognizing the importance of a presence on the web, our web page was also upgraded and maintained (<http://akpa.org>). We had two Outstanding Young Researcher

Award (OYRA) winners, Prof. Y. Y. Ahn of Indiana University and Dr. N. Y. Kim of Stanford University, who is the first woman awardee.

The OYRA has been awarded annually by AKPA since 1994, in order to recognize and promote excellence in research by outstanding young ethnic Korean physicists in North America. The AKPA Award Committee has recommended two winners from its OYRA 2013 review, and I have accepted that recommendation. Join me in congratulating Dr. S. B. Chung of the University of California, Los Angeles, and Dr. G. B. Jo of the University of California, Berkeley. The award ceremony will be held during the upcoming APS March Meeting at the Forum on International Physics (FIP) reception to be held at the Baltimore Convention Center. The AKPA annual meeting will be held after the FIP reception for the transition and inauguration of the 30th administration. As last year, there will be a Korean Physicists Symposium at the APS March meeting followed by the Traditional Wednesday Dinner, which will serve as a banquet. I hope to see all Korean participants to the APS March meeting at the FIP reception, Korean Symposium, and the banquet.

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A Physics Symposium consisting of at least eight sessions is currently being organized for the upcoming UKC 2013 to be held in East Rutherford, New Jersey from August 7 to 11, 2013. This symposium would bring together leading scientists and young researchers in various fields of physics from across the US and Korea. It will serve as a timely event for establishment of the Institute for Basic Science (IBS) and construction of the Korea Rare Isotope Accelerator (KoRIA) as part of the International Science & Business Belt (ISBB). Topics include but are not limited to High Energy Physics, Nuclear Physics, Laser-Matter Interaction Physics, Astronomy and Astrophysics, Nonlinear and Quantum Optics, Biophysics, Condensed Matter and Semiconductor Physics. More details can be found on the conference web site: <http://ukc.ksea.org/ukc2013>.

AKPA is energized and excited about what the future will bring to us. I hope it will continue to grow and benefit the broader community. I also hope our strong collaboration with APS will continue to promote scientific exchange between physicists from Korea and the United States. I would like to thank the KPS for friendship and for sponsoring one of the two OYRA winners three years in a row. I would also like to thank the Korean-American Scientists and Engineers Association (KSEA), and the Korea-US Science Cooperation Center (KUSCO) for their close cooperation and sponsorship.

Professor Eun-Suk Seo is the 29th President of AKPA and is at the University of Maryland.

The Overseas Chinese Physics Association (OCPA)

Ngee-Pong Chang, Haiyan Gao, Chi-Sing Lam, Cheuk-Yin Wong, Bin-Ling Young

The need for networking had been in the minds of many ethnic Chinese physicists working overseas since the 1960s. The number of ethnic Chinese physicists in North America and elsewhere had greatly increased in the 1980s with the arrival of many young physicists from Mainland China, in almost all physics graduate schools through the CUSPEA program or other means, and as faculty members or visiting scholars in many physics departments. Many of us in North America felt the need to establish an organization in the Chinese physics community, not only for the networking among us in North America, but also with our colleagues in Mainland China, Taiwan, Hong Kong and elsewhere. Starting in mid 1989, many interested colleagues, who later became founding members, held intensive discussions through emails and a number of face-to-face meetings. A not-for-profit corporation was registered in the State of New York in June of 1990 under the name "Overseas Chinese Physics Association Inc". With half a year of preparation, to draft its Charter and Bylaws, to plan its organizational structure, and to select the initial officers, OCPA was formally established in early 1991 with Ngee-Pong Chang as the first President. Web page: <http://www.ocpaweb.org/new/>

The establishment of OCPA has allowed us to interact more effectively among colleagues in the States, and in Mainland China, Taiwan, and elsewhere. In this early period, an annual meeting was held for several years in conjunction with the APS Spring meetings in Washington, DC, and later in Atlanta and other places. A special topics session entitled "Physics without Borders" had been organized by OCPA and hosted by the Forum on International Physics at the APS meeting, featuring general talks by well-known physicists, including several Nobel laureates. OCPA promoted the interests of Chinese-American scientists and highlighted their contributions to science and development in forums on scientific freedom and national security at meetings of the APS and the American Association for the Advancement of Science in 1999-2000. Many of these events received generous support and help from APS, particularly the APS officers in charge of International Affairs. To maintain the opportunity of face-to-face interactions among members, a special event has also been organized later by OCPA in the annual March meeting, and it has been continued to date.

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OCPA past Presidents from L to R: CHANG, Ngee-Pong (1991-1992, 1997-1998); CHANG, Tu-Nan (2001-2002); LIU, Keh-Fei (2003-2004); WENG, Wu-Tsung (2007-2008); GAO, Haiyan (2011-2012); YUAN, Chien-Peng (2009-2010); YOUNG, Bing-Lin (1993-1994); PENG, Jen-Chieh (2005-2006). Not in the picture: Chi-Sing Lam (1995-1996), and Wong, Cheuk-Yin (1999-2000).

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In order to recognize outstanding achievements of young Chinese researchers in all areas of physics, the Outstanding Young Researcher Award (OYRA) prize was established in 1992 and the Asia Achievement Award (AAA) prize in 1993. These prizes have also been continued to date. These prizes have become high profile activities of OCPA for close to two decades. Winners of these awards are all now well-established scientists in North America, Mainland China, Taiwan, Hong Kong, and Singapore. With the generous donation from Tu-Nan Chang and his family, the AAA prize was renamed as the Asia Achievement Award (Robert T. Poe Prize) in 2004. Thanks to a generous donation from the Macronix Educational Foundation, the OYRA prize was renamed as the Outstanding Young Researcher Award (Macronix Prize) in 2012. In the earlier days, OCPA held the OYRA and the AAA award ceremony at the APS meetings. In recent years, we contin-

ued this tradition at the APS March meeting FIP receptions in years when OCPA conferences did not take place.

With the increased interactions among Chinese physicists world-wide and the rapid expansion of research activities in the Asian regions, it is felt that a conference series with the OCPA perspective should be organized. After almost two years preparation involving many OCPA members in North America, Mainland China, Hong Kong, Taiwan, and Singapore, the first of the OCPA conference series, entitled First International Conference of Frontier of Physics: Looking to the 21th Century, was held in Shantou, Mainland China, in Aug 5-9, 1995 hosted by Shantou University. It is appropriate to quote part of the statement of the conference goal that appeared in the conference poster: "The conference encourages participation of all physicists, ... to meet

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and network, and to look towards new research strengths and directions for the coming century". The subsequent OCPA conferences, the latest one OCPA7 in August 1-5, 2011 held in Kaohsiung, show that the statement still rings true today. It should be noted that over the years, the number of participants of the OCPA conference has been increasing with over 800 participating in OCPA7. And all the conferences are highly successful owing to the dedicated OCPA organizers and the enthusiastic local host institutions and their capable local organizing teams. The OCPA8 conference will take place June 23-27, 2014 in Singapore. We are particularly proud of OCPA conference series where frontier physics research and physics education meet, and where more and young researchers are participating, and we also reach out to high school students and their teachers.

The establishment of an organization has its historical background, and OCPA is of no exception. It is a product of the needs of the time and the interactions among the relevant people. We clearly remember the energy and enthusiasm of all colleagues involved leading to its gestation and formation. We have received encouragement from several senior colleagues. There are too many colleagues who have contributed to the creation of OCPA to be named here. But we feel we should

make some exceptions. We have received strong support from Prof. T.D. Lee and Prof. C.N. Yang, to whom we have also sought counsel many times, and some of the meetings mentioned above were held in Prof. Lee's Columbia physics office. Another senior colleague who had been involved very closely during all stages of the formation of OCPA, and to whom we had also consulted frequently, but he declined to be named as a key officer is Prof. Leroy Chang. Professors Lee and Yang, and Leroy had given their full-hearted support to OCPA after its formation, of course. Unfortunately, Leroy passed away several years ago.

After 20 years, OCPA is under a new generation of leadership and is in the process of adopting a new name "International Organization of Chinese Physicists and Astronomer (OCPA) to reflect more appropriately its international outlook. OCPA is expected to enter a new phase by responding to the reality of the world today.

This article was prepared in January 2013 by Ngee-Pong Chang, Haiyan Gao, Chi-Sing Lam, Cheuk-Yin Wong, Bin-Ling Young, members and officers of OCPA.

Iranian-American Physicists (IrAP) Network Group *Hamid Javadi*

In January of 2007, the newly established network group of Iranian-American Physicists (IrAP) invited APS members of Iranian heritage to gather under a non-religious, non-political umbrella with well-organized bylaws to govern its activities. Over the years, the IrAP network group has strived to be a unifying voice among its members and has maintained contacts with similar professional organizations in the US (such as the Iranian Chemists Association of the American Chemical Society, and Association of Professors and Scholars of Iranian Heritage). Even-though Iranian-Americans are not a legally-recognized minority, IrAP network group represents the professional needs and aspirations of a small group (almost 500 registered members) of APS. We encourage our members to join the APS Forum on International Physics. We try to maintain regular contacts with the APS/FIP Executive Committee. In recent years, we have participated in each of the APS/FIP receptions that have taken place during the APS March meetings.



In 2012, we established a Graduate Student Research Award in honor of the renowned Iranian scientist “Biruni” who lived in 11th century and was well versed in Physics as well as other fields (for more information about Biruni please visit <http://en.wikipedia.org/wiki/Biruni> or the BBC documentary: Science and Islam 2/3). We are now in the process of reviewing candidates for the Biruni 2013 graduate student research

IrAP Network Group

award. This award has encouraged us to commit more of our energy and resources to academic excellence of US physics students of Iranian decent. This in turn prompted us to make some transitional changes to our bylaws (for review please visit:

www.irapnetwork.org). We are no longer being governed by a Board of Directors but instead by a Council of volunteers with equal governing power. We hope that in the future, this change will remove all barriers for participation of interested and qualified individuals in IrAP network group. We hope to do more by concentrating on the academic excellence of the next generation of US scientists who can build a better future for all with promises of peace, justice, and tolerance among the two nations.

If you are interested to support Biruni graduate student research award, please contact IrAP award coordinator: Farbod Shafiei, Ph.D, Department of Physics, University of Texas at Austin
 2511 Speedway RLM 5.208, Austin TX 78712. Email: farbod@physics.utexas.edu

We welcome your questions and comments. For general comments and to become a member of IrAP network group, please contact: Hamid Javadi, Ph. D. IrAP network group council member. Email: hamidjavadi@sbcglobal.net Our aspiration is to transform our network group to an Association of Iranian-American Physicists with stronger ties to APS and APS/FIP.

Hamid Javadi is President of the Iranian-American Physicists (IrAP) Network

The Ethiopian Physics Society in North America (EPS-NA)

Tessema Guebre Xabiher

The EPS-NA is a non-profit organization registered in the State of Connecticut. The society was established on August 2, 2008, at a general meeting attended by Ethiopian physicists from across the USA. The meeting was held at the American Physics Society (APS) headquarters, in College Park, with support and encouragement from Dr. Judy Franz, APS Executive Officer. Dr. Mulugeta Bekele, a founding member and current president of the Ethiopian Physics Society (EPS) in Ethiopia, was a keynote speaker and participated in the discussions. The meeting was also attended by other faculty from Addis Ababa University. The participants discussed and approved the bylaws of EPS-NA and elected the officials of the Executive Committee (EC) of EPS-NA. A general meeting planned for August 2013 will assess the fifth year of activity and elect new EC members.

The mission and goals of the society are to promote and support the education and training of Ethiopian physicists in Ethiopia, and in the US by:

- Donating educational materials, equipment, computers, etc.
- Providing scholarships, financial aid and mentoring assistance to students and educators in Ethiopia
- Disseminating information about career and scholarship opportunities
- Organizing conferences and workshops in Ethiopia
- Sponsoring educational programs and coordinated research in Ethiopia
- Providing a platform for networking for Ethiopian physics professionals
- Acting as a liaison between members of the organization and other science organizations
- Facilitating collaboration among universities in Ethiopia and in North America

The idea of an EPS-NA has been around since the late 1980s with a handful of dedicated individuals who met regularly at APS March Meetings. Since the late 1990s the activities grew strongly coupled to the growth of

the Ethiopian physics community in Ethiopia. In 1998 Dr Mulugeta Bekele, announced the following to all physicists residing abroad: *"I am sending this email to you to first inform you that the Ethiopian Physical Society (EPS) has been formed with its founding Conference held on 10 October 1998. It was a long (very!) awaited event and I am glad about it as much as you will be. I, therefore, request you to be a member of the Society."* This message marked the beginning of 10 years of gestation where Ethiopian physicists explored different forms of organization while being very active in the US-African community. The community grew in number and maturity in sync with the EPS, culminating with the 2008 formation of EPS-NA.

Currently, the society has about 100 registered members. About 40% reside in the US and work in academia, industry, and government labs. The remaining 60% reside in Ethiopia; most are students or faculty at fledgling physics departments around the country. Women make up 1 to 2% of the membership, a number that needs to improve.

The limited budget comes from individual contributions and membership fees. The activities are focused on laying the foundation of the society while addressing some of the missions and goals. Accomplishments over the last 4 years include:

- 1- Established the legal and non-profit status of EPS-NA.
- 2- Established and sustained a website to: <http://epsna.org>

- Inform, educate and communicate with the community.
- Start and sustain a "Who's Who" page featuring notable Ethiopian physicists who are role models to the younger African generation. Eight Ethiopian physicists have been featured and their stories depict the difficult working environment of African physicists, and the his-

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tory of the birth and development of physics in Ethiopia. These include the fascinating autobiography of Professor Mulugeta Bekele, a co-recipient of the 2012 Andrei Sakharov prize.

- Publicize achievements by Ethiopian physicists, research awards (NSF, Army), national or international recognitions such as Dr. Mulugeta's Andrei Sakharov prize, and Dr. Solomon Bililign's Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.
- 3- Sent 400 books to support the graduate library at Addis Ababa University.
 - 4- Launched an *EPS-NA Award and Scholarship* program to recognize the best physics, junior students, senior students, and graduate students in Ethiopia, and to raise the profile of physics in Ethiopia. The ambition is to grow this in partnership with major physics societies in the US and abroad.
 - 5- Worked with other societies to contribute to Science Research, Education and training in Africa.

In summary, EPS-NA is in its infancy; the major accomplishment is that Ethiopian physicists are emerging as a self organized sustained group. The foundations are solid for the society to grow into adolescence. The society is poised to become a stronger partner to EPS, and to other societies committed to the dissemination of physics world-wide and to broaden participation and diversify the physics community.

Professor Tessema Guebre Xabiher is President of the Ethiopian Physics Society in North America (EPS-NA) and Program Director for the National Facilities Program in the Division for Materials Research (DMR) at the National Science Foundation. His area of specialty is experimental condensed matter and materials physics.

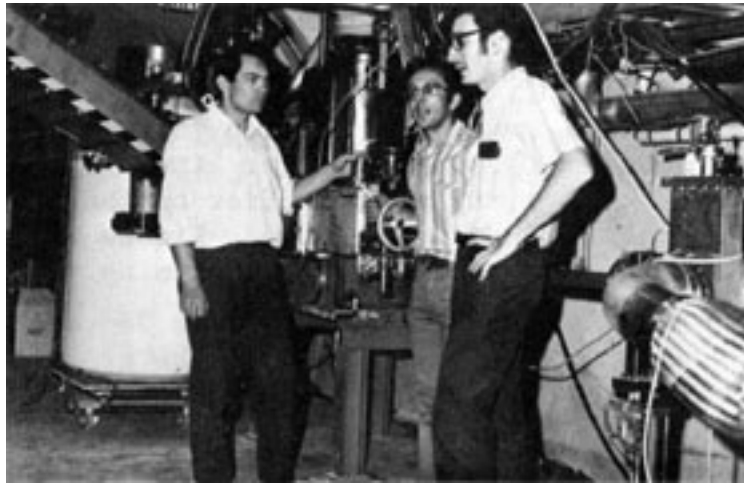
Disclaimer: the views expressed in this article do not necessarily represent the views of the National Science Foundation.



Dr. Mulugeta Bekele and Dr. Tessema G.X. at the Graduate Physics Library Addis Ababa University

Four decades ago an important milestone in international physics was achieved.

The context: in 1972 a fruitful international collaboration began. Scientists from the US and the Soviet Union joined forces to carry out a series of internal target experiments on pp and pHe elastic and inelastic scattering at the new accelerator at the National Accelerator Laboratory (later named Fermilab). The remarkable thing is that Experiment 36 described below was the first experiment carried out on a brand new machine. A significant quantity of equipment was shipped to the US and connected to the US supplied components. All of this was carried out during the cold war. These initial experiments began a long and successful collaboration that continues to this day.



July 1972. Experiment 36 at the C0 location in the Fermilab Main Ring.
L to R: Nikitin, Malamud, Strauss. *From the Fermilab history archives.*

On the Romantic Tevatron Era

Memoire by Vladimir Nikitin

It was a romantic time and there were exciting adventures in high-energy physics at the beginning of the Tevatron era. One of the earliest studies at this new accelerator was carried out just as the proton beam of the world's highest energy accelerator was making its first revolutions.

This was in March of 1972.

A joint team of scientists and engineers from the National Accelerator Laboratory (Batavia) and several US Universities, and the Joint Institute for Nuclear Research (Dubna) started experiment E-36 on proton proton elastic and inelastic scattering. The goal was to learn the properties of the strong interaction at the highest possible energy and study the so called asymptotic behavior. Such a study would make it possible to check the validity of the fundamental axioms of quantum field theory: micro causality, unitarity of the scattering matrix, analyticity of amplitudes and postulates of special relativity.

These experiments, carried out during the first three years of operation of the new machine greatly extended our knowledge of particle properties. We obtained the following results in the laboratory energy range 8 to 400 GeV.

1. The real part of the scattering amplitude rises and crosses zero and becomes positive at an energy ~ 280 GeV. This result was unexpected and required a correction in the asymptotic behavior of the total proton proton cross section.
2. The slope of the diffraction cone rises logarithmically, thus implying that the proton radius increases with energy. From this it was possible to determine the slope of the Pomeron trajectory, an important parameter in the model of the strong interaction.
3. Diffraction dissociation of the proton was measured. This inelastic process is sensitive to another important theoretical parameter, the constant of the triple Pomeron interaction. This was the first time such a measurement was done.

An important and novel element of the experimental technique was the use of a supersonic hydrogen jet target. This device creates localized gas flow in the accelerator vacuum chamber. It was created in JINR and was previously used at the Serpukhov 70 GeV accelerator. Using a pure hydrogen target was crucially important for detecting the inelastic diffraction reaction, where kinematic criteria are not sufficient to reject background.

It is interesting to recollect that the joint proposal for the E-36 experiment was submitted to the NAL Program Advisory Committee in 1971. The committee recommended postponing the project because the novel and not yet thoroughly tested gas jet target risked degrading accelerator performance. The NAL founding director, Robert R. Wilson met with the project initiators Vladimir Nikitin and Ernest Malamud, looked at photographs of the apparatus and made a personal decision to approve the experiment. He took a risk approving this contrary to advice from his Advisory Committee, on a brand new accelerator that at the time was having many difficulties in the commissioning process, and during the height of the cold war. Wilson was influenced by the elegant simplicity and originality of the technique and by his evaluation that the E-36 team would do a thorough professional job. Possibly Wilson was guided by his art intuition. Besides being one of the giants of accelerators, Wilson was also an accomplished professional artist. There is a philosophy in art that says a beautiful idea should be true.

Vladimir Nikitin is Professor of Physics at Moscow University and is a senior research scientist at the Joint Institute for Nuclear Research (J.I.N.R.) in Dubna, Russia.

Recent Visit to Bangladesh Universities and Physics Prizes

Sultana N. Nahar

Bangladesh has very poor representation in physics research, although some well-known physicists originated from there. Meghnad Saha of the Saha equation, used to describe chemical and physical conditions in stars, and Jagadish Chandra Bose, a father of radio science and inventor of wireless telecommunication, were from Bangladesh. Satyen Bose of Bose-Einstein statistics was the head of the Physics Department of Dhaka University, the top most university in Bangladesh, for 25 years before moving to India in 1945. The best students used to be fascinated and would enroll in physics while the current interest is rather in medicine or in engineering. I myself am a graduate with B.Sc.Hons. and M.Sc. degrees from Dhaka University

Bangladesh, a neighbor and surrounded mostly by India, is a country of about 150 million people, but has only about 15 state or public universities that offer masters degrees in physics and other subjects. A number of them, such as Dhaka, Jahangirnagar, Chittagong, and Rajshahi universities, offer a Ph.D. in physics. Jagannath University carries out Ph.D. research in collaboration with Dhaka University. Research is carried out at atomic energy centers and science laboratories as well. However, except by selected individuals, the research publication rate is low. Due to a lack of resources and an unfavorable environment, most physicists, even the most talented ones who did very well in their research in developed countries, are not involved in any cutting-edge or advanced research. Physicists in general in the western world are not familiar with the universities and physics activities in Bangladesh.

I have been involved in promoting physics research and education in Bangladesh to bring it to a par with other advanced countries for a long time. To motivate enhanced excellence in physics research and education I have introduced a sponsored STEM based program which presents awards to teachers in five research universities located at different places in Bangladesh. This article describes my experiences at them and highlights the physics prizes and awards which I founded and which motivate and enhance the physics community in Bangladesh.

The program is geared toward more efficient in-class teaching skills and more interactions between teachers and students on research projects. Bangladeshi students receive very little help outside class lectures and libraries do not have large collections. The internet is accessible to a very limited number of students and browsing on it is costly. Many students suffer frustration at not grasping basic concepts and how to solve problems. Hence efficient in-class teaching can greatly benefit a large number of students. To encourage development of more effective and helpful teaching skills, I have created the **Best Teacher Award**. For this award the students, largely the undergraduates, nominate the faculty member from whom they had learned the most. They cast votes during a class near the end of the academic year and nominations are made based on the votes.

The other award is a **Distinguished Teacher Award** where the teacher has research students. There is not much interaction between the advisor and the research students as they work on their projects. There is need for books, journal access, laboratory equipment and intellectual interaction. The interest of students often decreases and they take a long time to complete a project. So it is of crucial importance to have enthusiastic input from the advisor. The purpose of the award is to encourage more interaction between the students and the advisor and aims at publications that include the students. Here also the students make the nomination for the award based on their interactive research experience and learning. The other criterion for the award is publication with students.

My sponsored program at three of these universities also includes one scholarship for a meritorious student with financial need. The **Best Student Awards** benefit the students, not the general body of the students who come to the university after a lot of effort, at the expense of the hard savings of their parents, and with great hope.

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On January 6th of 2013 there was the wonderful news that Rajshahi University, after one and a half years of waiting, had approved physics awards, one for the best teacher and the other for the distinguished teacher. Rajshahi University is one of the oldest state universities in the country and is located in northwest Bangladesh. This university has an active group of researchers who publish in international journals. The idea of my program, which I adapted from the U.S. educational system, is new in Bangladesh and hence considerable effort is required to convince people of its positive impact. While Chittagong, Jagannath, and Rajshahi Universities have now accepted the program, two universities, Dhaka and Jahangirnagar are not able to implement the program even after 5 years of negotiation and establishment of trust. Their objections come from groups within their physics departments. They do not support the idea that students make the nominations. Teachers are held in high regard in society and enjoy this esteem. They argue that students are biased towards good treatment from a teacher rather than learning. They are also concerned about the negative prestige impact on the teachers who lose.

However, I am the founder and sponsor of similar STEM programs for education in six other educational institutions in Bangladesh: Kabi Nazrul Government College, Central Women's College, Maniza Rahman Girls High School, Panchdona Madrasa and Orphanage, Gandaria Government Primary School, Domdoma Primary School. Here also students vote, not to evaluate, but to nominate teachers based on their learning. All of them except one continue to implement the program and improve in educational excellence. Central Women's College has suspended the awards as it considers awards should be determined by other committees, not by students.

I am the initiator and sponsor of the promotional education and research program in Bangladesh. In negotiation with the institution I determine the policies and run the program through a month-long visit every 2 or 3 years and communicate the rest of the time by email, letters, and phone. I have a few helpers to carry out the

work. I travel with a box of collected physics and astronomy books to donate to the institutions. The month long stay is tightly scheduled with visits to the institutions, meetings with the Physics Chair, and with university officials to make financial arrangements for the programs. During each visit to a university I present a seminar, meet with physics faculty members, as well as physics students, and made a contribution of books to the library. There is great interest in advanced and current research. Most of the physics students know my email address and seek my advice on applying to Ph.D. Programs.

There are also **Razzaq-Shamsun Physics Prizes** open to any Bangladeshi for research publications in accredited physics journals in the previous year. This was my first effort which I initiated 18 years ago, in February 1995, to provide an incentive for research publications and presentations and to make Bangladeshi physicists visible. The prize is named after my father Abdur Razzaq, a prominent lawyer of the Dhaka Supreme Court, and my mother Shamsun Nahar. It is administered by Dhaka University. One Razzaq-Shamsun prize is annual and recognizes one or two physicists for new research publications and the other one, introduced in 2008, is for lifetime contributions in physics. Although initiated in 1995, it was six years before the first Razzaq-Shamsun prize was awarded in 2000. This prize was the first of its kind and required much explanation and many approvals. The awards have inspired increased research publications in Bangladesh and more papers are submitted in the award applications each year. However, due to various system backlogs, awards for 2008-2011 are still in process. The call for 2012 applications will be advertised in newspapers and university circulars soon.

In 2012, Professor Rashid, Vice Chancellor of Dhaka University, conducted the prize ceremony on prime time TV and media coverage. This honored and motivated the Bangladesh physics community. Three prominent physicists of Bangladesh, Professor Haurur-Rashid of high energy and nuclear physics, Professor Jamal Nazrul Islam of astrophysics and cosmology,

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and Professor Lalit Mohan Nath of particle physics were awarded lifetime achievement awards. Two past winners for the annual prizes of 2006 and 2007, Dr. Saleh H. Naqib of Rajshahi University and Dr. A.K.M.M.H. Meaze of Chittagong University also received their certificates and honoraria at the event.

Dr. Sultana N. Nahar, a [Bangladeshi American physicist](#), is a research scientist in the Department of Astronomy at [Ohio State University](#) and an elected member of the FIP Executive Committee.

She has published extensively on radiative and collisional atomic processes in astrophysical and laboratory plasmas, and also worked on dielectric satellite lines, theoretical spectroscopy, and computational nanospectroscopy for biomedical applications. Email: nahar@astronomy.ohio-state.edu Sultana Nahar is the winner of the APS 2013 John Wheatley Award.

Visit to Rajshahi University in July 2011



Entrance to the Physics Department with physics faculty members



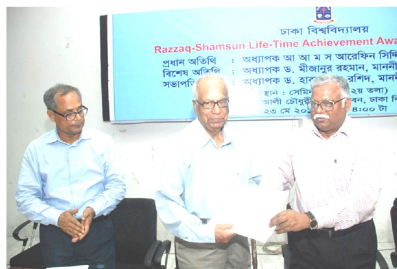
Presentation of a check for the sponsored program



Seminar presentation on nebular abundance



Contributing physics and astronomy books



Professor Harun-ur-Rashid is the recipient of the Razzaq-Shamsun Lifetime Achievement Award for contributions in physics.



Professor Jamal Nazrul Islam is the recipient of Razzaq-Shamsun Lifetime Achievement award for contributions in physics.

Report: Half-a-century of Travel of the Judd-Ofelt Theory

Lidia Smentek

Time: August 26-31, 2012

Place: Udine (Italy)

Venue: ICfE-8, 8th International Conference on f-Elements (<http://icfe8.uniud.it/>)

On August 1, 1962, two important papers were published:

Phys. Rev., 127, 750 (1962) by B. R. Judd
J.C.P., 37, 511 (1962) by G. S. Ofelt

Both publications were devoted to the theoretical description of the amazing spectroscopic properties of tripositive lanthanide (rare earth) ions. These ions, when embedded in various materials, bulk or nanoscale, over the years have revolutionized science, technology, medicine and even had an impact on everyday life.

Indicative of the importance of these elements is the recent announcement of a \$120 million US Department of Energy project to establish in Ames (Iowa) a new research center for developing methods of rare earth production. (<http://www.bbc.co.uk/news/technology-20986437>).

These two papers are the origin of the Judd-Ofelt (J-O) theory that describes the electric dipole transitions between the energy levels of $4f^N$ configurations of the lanthanides. These transitions, forbidden by parity selection rules in zeroth order, are regarded as forced by the crystal field generated by the surrounding ligands. The original theory is based on perturbation theory and is defined within single configuration and free ionic system approximations, with the crystal field potential as a perturbation. The J-O approach to the $f \leftrightarrow f$ electric dipole transitions has turned out to be a very powerful tool, and in fact the only one, for the reproduction of the observed spectroscopic patterns. This is especially true when a semi-empirical procedure is applied for its one particle parameterization scheme of f-spectra.

The late Brian G. Wybourne (one of the founders of

lanthanide spectroscopy), on the occasion of the 40th anniversary of the J-O theory celebrated in 2003 at the Conference in Łądek Zdrój (Poland), wrote:

“The Judd-Ofelt theory marked a turning point in our understanding of the fascinating spectroscopic properties of the rare earths. It has been, in a very real sense, the first step in the journey to an understanding of the rare earths and their much heavier cousins, the actinides, but like many journeys into the unknown, the end is not in sight”

At ICfE-8, organized in Udine at the end of August 2012 the Golden Anniversary of the J-O Theory was celebrated.

The importance of the J-O Theory is illustrated in the figure below by the growing number of citations over the half century since its formulation. (The last bar on the drawing below covers only half of 2012.)



Behind the scientific value of the J-O Theory that cannot be overestimated, is a story that makes the origin of the field more colorful than might be expected from reading the publications. Brian Wybourne (Copernicus University, Toruń, Poland) with the assistance of Brian Judd (Johns Hopkins University, Baltimore) succeeded in finding George Ofelt who had been missing from the lanthanide stage for almost 40 years. Nobody in the field had contact with George, who after completing

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his Ph.D. under the supervision of Wybourne (late fifties and early sixties) left Johns Hopkins to where Brian Judd had moved from Berkeley. Finally in 1998 George was found, and only at that time did he learn from Brian Wybourne that he shares fame with Brian Judd, and that there is in the literature of the field a theory named after him that is based in part on his Ph.D. research. The additional fact that Brian Judd and George Ofelt had never met personally was a challenge in trying to arrange their first meeting. On Sunday June 22, 2003 a historical meeting took place in Łądek Zdrój, Poland, where the traditional school 4th *International Spring Workshop on Spectroscopy, Structure and Synthesis of Rare Earth Systems* was organized.

That Sunday Judd, Ofelt and Wybourne met. Only Brian Wybourne knew the other two, since he was part of the process of the development of the theory in the early sixties.



L to R, Brian Judd, George Ofelt and Brian Wybourne in Łądek Zdrój together for the first time.

Nine years have quickly passed since this historic meeting! The Golden Anniversary of the J-O Theory

was celebrated in Udine in 2012, and both guests of honor, Brian Judd and George Ofelt, were present to share their memories with the audience, among whom some attendees were at least two generations their junior. The idea behind this celebration was to connect those who established the origin of the field half a century ago with the next generation is contributing to the explosion of scientific achievements based on the Judd-Ofelt Theory.

Celebration of the golden anniversary had two parts, a regular conference session devoted to the theory and spectroscopy, and a festive and moving birthday celebration. There were congratulations, and shared memories, photographs from the past, and personal memoirs of those who were unable to be present. As at the 40th anniversary, there was a concert, performed just after the birthday cake with candles for the guests of honor to blow out, and a champagne toast.

Brian Judd played a selection Scott Joplin classics on a grand piano (especially transported to the lecture hall) and George Ofelt's twelve-year old granddaughter Sterling Yco performed on the flute.

I would like to thank Alessandro Trovarelli (Università di Udine, Italy) and Marco Bettinelli (Università di Verona, Italy), the main organizers of the ICfE-8 in Udine, for giving me *carte blanche* for organizing this birthday celebration. My gratitude is addressed also to Oscar Malta (Universidade Federal de Pernambuco, Recife, Brazil) and Gerd Meyer (Universität zu Köln, Germany) for their support and encouragement.

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



George Ofelt (left) and Brian Judd sharing own memories, and then cutting the birthday cake



The Judd-Ofelt concert: Brian Judd at the piano and Sterling Yco playing flute



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