



Spring 2016 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.*

Message from the Chair

Maria Spiropulu



What an awe-inspiring year 2015 was for international science cooperation, policy, deals, agreements and protocols! We have witnessed some historic events indeed. On 7 May 2015 in a White House ceremony led by OSTP Associate Director for Science Jo Handelsman, the United States signed an agreement for renewed cooperation with CERN-- the famous for the Higgs discovery pan-European laboratory, international organization, and center for scientific excellence. Under this historic CERN-US Cooperation Agreement, US Ambassador Hamamoto and CERN Director General Heuer signed a first series of four Protocols, plus one Addendum on Friday 18 December 2015 [1]. I was present in both those historic ceremonies. I can attest that the cooperation spirit is infectious. It inspires confidence in grand upcoming leaps and discoveries that change the way we think about the world.

On 14 July 2015 an international agreement toward nuclear non-proliferation was reached in Vienna (the Joint Comprehensive Plan of Action or “Iran deal” between Iran, China, France, Russia, United Kingdom, United States, Germany and the European Union.) And a new era in US–Cuba relations has opened in 2015 that is bound to boost scientific cooperation between the two countries, given relaxing visa application requirements and shortening the process for scientists wishing to attend scientific meetings in the US or Cuba. These developments inspired some FIP invited sessions and talks at the March and April meetings.

Indeed our own Forum on International Physics grew further in 2015 reaching close to 4000 members! After the recent election we are lucky to capture Jerry Peter-

son (Colorado) as Vice-Chair, along with Surajit Sen (SUNY), and Vladimir Shiltsev (Fermilab) as Members at Large. Noemi Mirkin was re-elected in the position of Secretary/Treasurer and deserves our gratitude for serving FIP tirelessly! Cherrill Spencer rises in the Chair line to Chair-Elect in 2016. We thank Ed Berger (Chair in 2015) and Ercan Alp (Past-Chair in 2015) for their years of dedicated leadership of FIP.

In 2015 we have eight new APS fellows nominated by FIP. Congratulations to Xiao-Gang He (National Taiwan University) W. Mochan (Instituto de Ciencias Físicas) Jorge Morfin (Fermi National Accelerator Laboratory) Choo-Hiap Oh (National University of Singapore) James Proudfoot (Argonne National Laboratory), Javid Sheikh, Eric Suraud (Université Paul Sabatier) and David Vitali (University of Camerino).

Noemi Mirkin together with the APS Office of International Affairs, the Overseas Chinese Physics Association (OCPA), the Association of Korean Physicists in America (AKPA) and the Iranian-American Physicists Group Network (IrAP) have organized the FIP Reception that will take place on March 15 at 6:00 pm (Latrobe Room - Hilton Baltimore). In this reception we honor the 2015 FIP APS Fellows and present them their awards. The FIP reception is an excellent opportunity to interact with speakers, officers of the American Physical Society, members of the co-sponsoring organizations, and your fellow FIP members, so mark your calendars and make sure you attend!

FIP ran in 2015 two cycles of the International Research Travel Grant Program (IRTGP) and I would like to note a continuous increase of applications to the program, signifying its impact and success. In her capacity as Vice-Chair of the Executive Committee in 2016, Cherrill Spenser will be responsible for the review process of the next two cycles with the help of Michele Irvin of APS. Applications for the program (IRTAP) are due April 15. <http://www.aps.org/programs/international/programs/travel-grants.cfm>.

In addition, in 2015 we launched a pilot program (DS3) to support outstanding international students (both graduates and exceptional undergraduates) to travel and participate in the APS annual meetings. Congratulations to the first four students (Arita Gosh,

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Karan Jani, Arpan Sharma and Jasen Domoguen) selected by the DS3 program to give a talk or present posters in the April Meeting in Salt Lake City. FIP is grateful to Christine Darve, Maria Longobardi, Jason Gardner and Noemi Mirkin for their hard and persistent work towards launching this program. I would like to note the efforts of former FIP Chair and colleague of mine Harvey Newman who initiated the program some years ago.

In 2015 we had a successful and rather well attended set of invited sessions in the March and April meetings. This year FIP is offering again several interesting and exciting sessions: In March I have organized with Ilya Nemenman of DBIO “Large Scale Neuroscience Projects” (Session B12), with Aldo Romero of FIP and Barry Klein of DCOMP “International Cooperative efforts for electronic structure methods” (Session P14) and with David Gross and the help and participation of Frances Colón of the State Department “Physics and Physicists in Cuba” (Session Y4).

In April I have organized with Rocky Kolb “Big International Telescopes” (Session Y7), with Marcela Carena of DPF “Big International Neutrino Projects and Collaborations” (Session S7) and taking many of your suggestions the “Physics and Physicists around the world” (Session X7) featuring Iran, China and Russia. In addition FIP is organizing this year the Sakharov Prize session (U7) where we will honor Zafra Lerman, President of the Malta Conferences Foundation who is this year’s recipient of the Sakharov Prize “For life-long devotion to the scientific freedom and human rights of scientists throughout the world and for compelling leadership in using science as a bridge to peace in the Middle East.” In the same session Adam Jermyn will receive his LeRoy Apker Thesis Award “For original contributions to understanding how the atmospheres of pulsar companions are heated and for elucidating the observational consequences.” Perry Link, the translator of the Fang Lizhi auto-biography “The most wanted man in China,” will give a tribute in honor of Feng Lizhi and his recognized human rights work.

On behalf of FIP I wish to congratulate Per Nordblad of Uppsala University, 2015 John Wheatley Award Recipient “For his enormous and sustained efforts of nearly three decades in nurturing physics research and education in several Third World countries, including

Bangladesh, Vietnam, Thailand and Eritrea, leading to the establishment of several prominent groups pursuing internationally competitive physics today.” I also wish to congratulate the recipients of the 2016 Beller Lectureships: Laura Heyderman (ETH Zurich - Paul Scherrer Institute, Switzerland), Götz Neuneck (Institute for Peace Research and Security Policy, University of Hamburg, Germany) & David Wootton (University of York, United Kingdom).

At the time of this writing we are all awaiting the results from LIGO to be announced and there is no physicist in the entire Universe who is not excited about the experimental discovery of gravitational waves. The reach of the human capacity and persistence is awe-inspiring: using quantum precision measurements and devices to establish a cosmic observatory and inaugurate a new field of science. The LIGO Scientific Collaboration (LSC) is comprised of more than 1000 people from over 90 institutions and 15 countries worldwide. The cadence of science is international!

Let me close by encouraging you to attend this year’s FIP sessions at the spring meetings. I invite you to send us your feedback and ideas for next year’s FIP sessions, as well as all the international science programs FIP is running and urge you to engage in the activities of the Forum, bring the mission to the attention of potential new members and think how we can all make science a vehicle for international partnerships at all levels and global engagement the enabler of scientific breakthroughs.

Reference

The “Experiments Protocol II”, on the US participation in ATLAS and CMS, including participation in the HL-LHC upgrades and operation, the “Nuclear Physics Experiments Protocol I”, on the US participation in the heavy ion programmes of ALICE, ATLAS and CMS, the “Accelerator Protocol III”, on the US participation in the LHC high luminosity upgrade and finally the “Neutrino protocol I”, on the participation of CERN in the future Fermilab Long-Baseline Neutrino Programme (LBNP). In addition, both parties signed an Addendum to “Accelerator Protocol III” on the US participation in the Future Circular Collider study.

Maria Spiropulu, our FIP Chair, is an experimental physicist and Professor of Physics at the California Institute of Technology. She is a member of the CMS collaboration at the Large Hadron Collider.

Report from the APS International Affairs Office (INTAF)

Amy Flatten



It is a pleasure to start 2016 by thanking the members of the Forum on International Physics (FIP) for their contributions to the international programs of the APS. The partnership between FIP and the APS and the International Affairs Office (INTAF) has launched programs that have served our fellow APS members and our physics colleagues worldwide. To serve our international members, as well as the international physics community, INTAF partnered with FIP and with organizations across the globe to offer exchanges, travel awards, and training programs.

In looking back over this past year, a few opportunities stood out – these are ongoing, sustainable programs to which FIP members and other physicists may wish to apply in the future. For example, in partnership with the Indo-US Science and Technology Forum (IUSSTF) and the Sociedade Brasileira de Física (SBF), APS offered the Brazil and India Physics Ph.D. Student, Postdoc and Professor Exchange Programs. These exchange programs enabled Ph.D. students and postdocs to work overseas with a professor in his/her field of study, and funded senior physicists to teach a short course or deliver a lecture series in the other country. Watch for our next call for proposals for the Brazil program in the spring. All of these and more are announced on our website: <http://www.aps.org/programs/international/honors/index.cfm>

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. Here, Chairs of APS Units are invited to submit nominations for international speakers during their sessions at the March and April meetings. I would like to take this opportunity to congratulate the Beller and Marshak Lectureship Recipients for 2016:

Beller Lectureships:

Laura Heyderman

ETH Zurich - Paul Scherrer Institute, Switzerland
Nominated by the Topical Group on Magnetism and its Applications (GMAG)
Speaking at the March Meeting in Session L5,
Wednesday, March 16.

Götz Neuneck

Institute for Peace Research and Security Policy,
University of Hamburg, Germany
Nominated by the Forum on Physics and Society (FPS)
Speaking at the March Meeting in Session S14,
Thursday, March 17.

David Wootton

University of York, United Kingdom
Nominated by the Forum on the History of Physics (FHP)
Speaking at the March Meeting in Session C14,
Monday, March 14.

Marshak Lectureship:

Anton Khlopkov

The Center for Energy and Security Studies, Russia
Nominated by the Forum on Physics and Society (FPS)
Speaking at the March Meeting in Session S14,
Thur., Mar. 17.

The FIP newsletters often give FIP members insights regarding international events at the APS annual meetings. Along with the Beller and Marshak Lectureships mentioned above, I also wel-

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come the chance to inform FIP members of an exciting new initiative, led by the APS Office of International Affairs, which will take place in conjunction with the 2016 March Meeting.

As many FIP members are already aware, the APS has been working to provide physicists with international experiences and opportunities to build and strengthen international networks. We believe this is especially important for postdocs and early career physicists. One of the ways that we are serving this group is through the **US-Brazil Young Physicists Forum (YPF)**, that will be held in Baltimore, MD, on March 12-13, 2016--the weekend before the 2016 APS March Meeting. APS is co-sponsoring this event with the Brazilian Physical Society (SBF) and the São Paulo Research Foundation (FAPESP).

This event is specifically dedicated to postdocs, as well as early career-physicists in permanent positions, in the United States and Brazil (i.e., any physicists that have obtained their PhD within the past 10 years). The Forum is focused on helping attendees build international and interdisciplinary networks and will provide participants with:

- Networking, scientific presentations, and social events with leading Brazilian and American physicists working in academia and industry
- Career development sessions on publishing in peer reviewed journals
- Panel discussions on university-industry cooperation
- Scientific parallel sessions and poster sessions with international peers
- Opportunities for building international and interdisciplinary collaborations

During the day and a half meeting, eminent senior physicists will present plenary talks to the early-career physicists, followed by parallel sessions with the participants themselves presenting to each other. Two panel discussions focused upon professional development and career-building will be tailored to both US and Brazilian physicists' interests. These include "University-Industry Collaboration in Research in the US and Brazil" and "Life as a Young Physicist in Brazil and the United States."

Perhaps most exciting, a poster-session/networking-reception will allow early-career physicists to discuss their research with not only their international peers, but also with industry leaders and distinguished VIPs from the São Paulo Research Foundation, APS and SBF. Leaders from both physical societies will address the participants, including, APS President Homer Neal and APS CEO Kate Kirby. APS President-Elect Laura Greene will provide a session on "Publishing in Peer-Reviewed Journals," a session that she has given to international audiences of scientists around the globe. Likewise, both the President and Vice President of the Brazilian Physical Society, Ricardo Galvão, and Belita Koiler, will give plenary talks, along with 2014 APS President Malcolm Beasley, and APS Vice-President, Roger Falcone.

Throughout the YPF, physicists can discuss their work and connect with potential partners and international colleagues in a smaller, more intimate setting than the larger March Meeting will allow. The relationships formed at this conference have the potential to last throughout the participants' professional lives, as they continue to attend APS or SBF annual meetings, and other international conferences in related subfields. Consequently, the US-Brazil Young Physicists Forum has the potential to lead to many fruitful interdisciplinary and/or international networks and collaborations throughout the participants' careers.

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

From the Editor and a Call for a New Editor

Ernie Malamud

Many thanks to the authors for their excellent articles in this issue. They cover a wide range of international physics activities and events in different countries.

With this issue and the next one (**DEADLINE August 15, 2016**), I will have edited 12 issues of the FIP Newsletter (two 3-year terms). It is now time for someone else to take over this important FIP activity in 2017. A point to mention to those interested in the job is that in contrast with many other APS units, the Newsletter Editor is a voting member of the FIP Executive Committee which, with the Editor numbers 13.

The relevant sections of the FIP by-laws are the following:

ARTICLE V – EXECUTIVE COMMITTEE, 2. Composition. The FIP Executive Committee shall consist of the immediate Past Chair, Chair, Chair-Elect, Vice-Chair, Secretary/Treasurer, six Members-at-Large, the Editor of the FIP Newsletter, and the FIP Councillor elected in the manner specified in Article VII of these Bylaws. All current APS International Councillors shall be *ex officio* members of the FIP Executive Committee.

ARTICLE IX – APPOINTED COMMITTEES, 4. The Newsletter Committee: The Executive Committee shall elect an Editor for the Newsletter to a renewable term of three years. The Editor may recruit Newsletter Committee members as required from among FIP members. The Newsletter Committee shall be responsible for collecting and reporting on issues and events in the interests of FIP members, and producing two issues of the Newsletter each year; one of which shall be sent to FIP members and shall include election and balloting information, and the other of which, if the Secretary/Treasurer so approves, shall go to the entire APS membership.

To summarize what from the by-laws has been followed and what has not:

1. We have produced two newsletters/year but for financial reasons, the newsletters have only been distributed electronically. With the approval of our

Secretary-Treasurer I have printed a small number (roughly 100) for distribution to authors, the Executive Committee, the Newsletter Committee and made some available in the registration area at the APS spring meetings.

2. The FIP Newsletter has not been distributed to the entire APS Membership, although it is, of course, available on the APS website. However, there is a column from the APS Office of International Affairs which appears in the monthly APS news.
3. Balloting information has not been included. Sending an “email blast” from the Secretary-Treasurer to the membership is more appropriate to election timing. As for the election, each newsletter spring issue has covered the results of election to the Executive Committee.
4. I have found it very helpful to have a newsletter committee of 5 people.

The Newsletter is an important way to communicate with members, complimentary to sessions at the APS spring meetings. Many of our 3,000 plus members cannot attend the spring meetings; rarely can they attend both the March and April ones, both of which have FIP sessions.

Hopefully a new newsletter Editor can be found and confirmed during our FIP Executive Committee meeting in Salt Lake City on Saturday, April 16. Then I would be very pleased if this new “Editor-Elect” could work with me on my last issue, fall 2016. Our new Editor would solicit articles and announcements, and could change format and layout to give our newsletters a “new look.”

Please contact me or other members of the FIP Executive Committee if you want to discuss this possibility and throw your hat in the ring to become FIP’s new newsletter Editor.

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 on the adjunct faculty at the Univ. of Nevada. During a meeting this year in Grenoble he was elected to the African Light Source (AFLS) Steering Committee.



Session B12: Large Scale Neuroscience Projects Monday, March 14, 2016, 11:15 am

Co-sponsor: DBIO; **Chair:** Maria Spiropulu, California Institute of Technology

- Terry Sejnowski, “Computational Neuroscience Today”
- Miyoung Chun, “The BRAIN Initiative”
- Demis Hassabis, “Deep Mind”
- Hanchuan Peng, “Big neuron”
- David Tank, “The Global Brain (Simons Collaboration)”

Session P14: International Cooperative Efforts for Electronic Structure Methods

Wednesday, March 16, 2016 2:30 pm

Co-sponsor: DCOMP; **Chair:** Aldo Romero, West Virginia University

- Lucia Reining, “The European Theoretical Spectroscopy Facility: an illustration for the power of collective research”
- Gian-Marco Rignanese, “The ABINIT software project”
- Francois Gygi, “The Road to Interoperable Simulation Software: Examples Using the Qbox Code”
- Micael Oliveira, “The CECAM Electronic Structure Library: community-driven development of software libraries for electronic structure simulations”
- Andrea Marini, “The Yambo code: a comprehensive tool to perform ab-initio simulations of equilibrium and out-of-equilibrium properties”

Session Y4: Physics and Physicists in Cuba Friday Mar 18 2016 11:15 am,

Chair: Maria Spiropulu, California Institute of Technology

- David Gross, “The Role of Science Cooperation in World-Wide Social Progress”
- Fidel Castro Díaz-Balart, “Physics & Physicists in Cuba”
- Frances Colon, “Science and Technology Diplomacy with Cuba”

FIP Reception, Tuesday, March 15, 6 – 8 pm. Hilton Baltimore Latrobe room.

Co-sponsors:

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



APRIL
MEETING 2016

April 16 - 19
SALT LAKE CITY, UTAH

Session S7. “Big International Neutrino Projects and Collaborations”

Monday, April 18, 1:30 pm

- David Wark, Global neutrino futures
- Mark Thomson, DUNE: A Large International Collaboration From the Start
- Katsanevas Stavros, The European Neutrino Landscape

U7. Sakharov Prize Session, Monday, April 18, 2 pm.

- Zafra Lerman, Andrei Sakharov Prize: Human Rights and Peace - A Personal Odyssey
- Perry Link, Fang Lizhi Memorial Lecture
- Adam Jermyn, LeRoy Apker Award: The Atmospheric Dynamics of Pulsar Companions

Session X7. “Physics and Physicists around the world” Tuesday, April 19, 10:45 am

- Vladimir Shiltsev, Physics and Physicists in Russia
- Hossein Sadeghpour, Physics and Physicists in Iran
- Wang Yifang, Physics and Physicists in China

Session Y7. Next Generation of Large International Telescopes and Cosmic Experiments, Tuesday, April 19, 1:30 pm

- Wendy L. Freedman, The Next Generation of Optical Telescopes
- Angela Olinto, Evolution and Next Generation of Large Cosmic-Ray Experiments
- Miguel Morales, Current and future radio-astronomy mega-projects

**FIP’s Distinguished Student Seminar Program (DS3)
to support outstanding international students**

Karan Jani, (Georgia Institute of Technology), Contributed paper K15 “Confronting Numerical Relativity With Nature: A model-independent characterization of binary black-hole systems in LIGO” 2:30-2:42 pm, Sunday, April 17, room 251C

Poster papers by

Arita Gosh
Arpan Sharma
Jasen Domoguen

FIP ELECTIONS MATTER – GET INVOLVED!

Edmond Berger

FIP will hold an election in 2016 to renew the Executive Committee, as we do every year. Your input matters!

In 2016 we will be electing a new member of the Chair line and two new Members-at-Large of the Executive Committee. Members-at-Large serve for 3 years. A person in the Chair line serves for 4 years, one year as Vice-Chair, a second as Chair-elect, a third as Chair, and finally a year as Past-Chair.

The election process starts with the organization of a Nominating Committee and suggestions of possible nominees from members of FIP. In his role as Past-Chair in 2016, Ed Berger is charged with forming the Nominating Committee, soliciting input from the membership, and putting together a ballot. The names of the committee will appear on the FIP website shortly, and all FIP members should expect an e-mail about the election process.

Meanwhile, as you think about possible nominees, please do not delay sending your suggestions to Ed Berger (berger@anl.gov). Please provide as much background information as possible on your nominee, including a link to a CV. Most important is your own explanation of why the nominee would be a strong addition to the FIP leadership.

The 2015 election was very competitive for all open positions. On behalf of all of us, I thank all who expressed a willingness to stand for election and a desire to contribute. As you may read elsewhere in this FIP Newsletter, we re-elected our esteemed Noemi Mirkin to another 4-year term as Secretary-Treasurer. The two new Members-at-Large are Vladimir D. Shiltsev and Surajit Sen. The new member of the Chair line is Roy Jerome (Jerry) Peterson. Included below are brief introductions of the new members.

Jerry Peterson is a Professor Emeritus of Physics at the University of Colorado Boulder and a Fellow of the APS. He earned his PhD in 1966 and has been an experimental nuclear physicist ever since, working at facilities around the world. In addition to his affiliation with the Department of Physics at Colorado, he was a Professor of International Affairs from 2004 to 2014, where he is also a Faculty Associate of the interdisciplinary Center for Asian Studies and of the Center for Science and Technology Policy Research. He was a Jefferson Science Fellow at the US Department of State in for several years. He is an elected Foreign Fellow of the Pakistan Academy of Sciences.

Vladimir Shiltsev is the Director of the Accelerator Physics Center at Fermilab and a Fellow of the APS. He received his Ph.D. in physics from the Budker INP (Novosibirsk) in 1994. His research interests include high energy particle colliders, beam dynamics, and accelerator science and technology. Among his international activities, he serves as the President of the international Russian-speaking Academic Scientists Association (RASA) and was instrumental in establishing formal connections between RASA and the APS.

Surajit Sen is a Professor at the State University of New York at Buffalo and a Fellow of both APS and AAAS. Born and raised in Calcutta, he earned his PhD at the University of Georgia. He is a nonlinear dynamical and statistical physicist working on granular materials and related fundamental nonlinear systems. His international activities include service as an Editor of the International Journal of Modern Physics B and of Modern Physics Letters B. and a two-term elected president of the American Chapter of Indian Physics Association.

Edmond L Berger, FIP Past-Chair 2016, is a high energy elementary particle theorist and Distinguished Fellow at Argonne National Laboratory. He is a Fellow of the APS and served previously as Chair of the Division of Particles and Fields (1990); Chair of APS Committee on Constitution and Bylaws (2011); and Chair of the APS Committee on Meetings (1995).

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Noemi Mirkin



Jerry Petersen



Vladimir Shiltsev



Surajit Sen

2016 Andrei Sakharov Prize awarded to Zafra Lerman, Malta Conferences Foundation



Citation: *"For life-long devotion to the scientific freedom and human rights of scientists throughout the world and for compelling leadership in using science as a bridge to peace in the Middle East."*

Zafra is co-author with Morton Hoffman of the article "The Malta Conferences, Frontiers of Science: Research and Education in the Middle East" in this issue.

Andrei Sakharov and Zafra Lerman



Taken in Washington in 1988 by an anonymous photographer during an event organized by the Albert Einstein Peace Prize Foundation.

Reprinted with permission.

Lerman was a member of the Executive Committee of the Albert Einstein Peace Prize Foundation. She explains the background of the foundation and the circumstances in which the picture was taken: "The foundation worked towards normalization between Egypt and Israel after nothing was happening as a result of the 1979 Peace Treaty. One of our projects was to build an agricultural settlement like a Moshav in Israel, called 'Maryut Agroindustrial complex project; a regional project involving Egypt and Israel.'

Our second activity was to give a peace prize every year in a ceremony in Washington. In 1988, we gave it to Sakharov, which is when the picture was taken. Before the ceremony, I had the opportunity to discuss my human rights activities with him through an interpreter. He suggested that I take a crash course in Russian, which I did before going back to the Soviet Union to continue my work with dissidents."

FIP Members Recognized as APS Fellows

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

Xiao-Gang He, National Taiwan University

Citation: For influential contributions to particle phenomenology in CP violation and flavor physics, and in quantum topological phases, and for his leadership in promoting national and international collaborations in theoretical physics.



W. Luis Mochan, Instituto de Ciencias Físicas, UNAM, Mexico

Citation: For pioneering and imaginative work on the theoretical description of optical properties of surfaces and nanostructured materials, as well as for continuing efforts to communicate physics to a broad audience.

Jorge Morfin, Fermi National Accelerator Laboratory

Citation: For uniting theorists and experimentalists, particle and nuclear physicists, and physicists from North, Central and South America in understanding strong interactions in the nucleon, in the nucleus, and in neutrino interactions on nuclei.

Choo-Hiap Oh, National University of Singapore

Citation: For vital contributions to the development of physics teaching and research in Singapore, especially establishing its leading position in research in quantum technology, and for important personal contributions to this field.

James Proudfoot, Argonne National Laboratory

Citation: For mentoring young physicists from around the world, including those in underdeveloped nations, in the advancement of calorimetric techniques in HEP experiments and their application to electroweak and strong interaction measurements.

Javid Sheikh, University of Kashmir, Srinagar, India

Citation: For a pioneering contribution to the study of nuclei beyond the valley of stability and for developing symmetry projected mean field equations.

Eric Suraud, Université Paul Sabatier, Toulouse, France

Citation: For major contributions to cluster physics, including development of a microscopic description of the nonlinear response of irradiated clusters and molecules leading to a wide range of applications, and for developing ties with emerging nations in Eastern Europe and Asia.

David Vitali, University of Camerino, Italy

Citation: For groundbreaking work on cavity opto-mechanics, which proved to provide an ideal and flexible environment for quantum information processing and quantum-limited sensing; for proposing pioneering techniques to control decoherence in quantum systems.

The ESRF: a model of international cooperation

Anya Joly

Observing matter and decoding its secrets are at the heart of humanity's quest to improve the understanding of the world around us. Synchrotron radiation facilities offer unique tools to push back the boundaries of scientific investigations into new materials and living matter. As centres of excellence for fundamental research, light sources also play a key role in stimulating innovation and enhancing competitiveness for industry. In 1988, eleven countries, recognising synchrotron radiation as an essential tool for science, technology and industrial applications, and desiring to intensify scientific co-operation across disciplinary and national boundaries, joined forces to launch the construction of the European Synchrotron Radiation Facility – the ESRF.

Over the years, further countries joined this ambitious project and today the facility, based in Grenoble, France, is supported by 21 partner nations, of which 13 are Members and 8 are Scientific Associates. Not limited to European nations, the ESRF's most recent affiliates include the Russian Federation, which marked its accession to the ESRF Convention in June 2014, and South Africa, which signed a medium-term arrangement with the ESRF in May 2013. Israel also increased its participation in 2013, renewing its associate status for a further five years.

By fulfilling the objectives determined at its creation, the ESRF has established itself as the world's most intense source of synchrotron-generated light and has been at the forefront of scientific research for over 20 years, providing unrivalled opportunities for an international community of scientists in the exploration of materials and living matter in a very wide variety of fields: material physics, chemistry, archaeology and cultural heritage, structural biology and medical applications, environmental sciences, information science and nanotechnologies.

Every year, around 4 000 researchers from more than 50 countries around the world come to the ESRF to access the 43 highly specialised beamlines, each equipped with state-of-the-art instrumentation. The output of the ESRF is similarly impressive, with a record 26,000 refereed publications in top scientific jour-

nals in 20 years and four Nobel prizes awarded to laureates using the ESRF for their work. In 2011, for the first time ever, more than 1000 protein structures were deposited in a single year in the worldwide Protein Data Bank (PDB) from data collection at the ESRF [1].

Since its beginnings the ESRF has played a major role in the international science scene and continues to actively participate in major multinational projects, in particular as part of the European Union's research and innovation programme, Horizon 2020. Examples include the European Cluster of Advanced Laser Light Sources (EUCALL), a €7m project designed to foster closer collaboration between major X-ray sources and advanced laser facilities, and the €12m NFFA-EUROPE project, which seeks to implement a full suite of key research infrastructures for nanoscience for the benefit of a broad community. The ESRF will also play a key role in characterising diamond material for the Green Diamond project [2], which aims to develop high-power diamond electronic devices, to reduce the huge energy losses associated with electrical power transmission and transport.

The ESRF is active in promoting links with international industry, hosting events such as Netherlands@GIANT in June 2013, which provided an opportunity for the representatives of more than 20 Dutch high-technology businesses to meet and exchange ideas with Grenoble-based science and innovation leaders. The facility also has an impressive academic outreach programme, supporting the HERCULES school and establishing the International Student Summer Programme for undergraduates from all over Europe jointly with the Institut Laue-Langevin. In 2016, the Synchrotron@School programme will organise visits from 27 high-school classes to the ESRF, including students from Turkey, Germany and the UK.

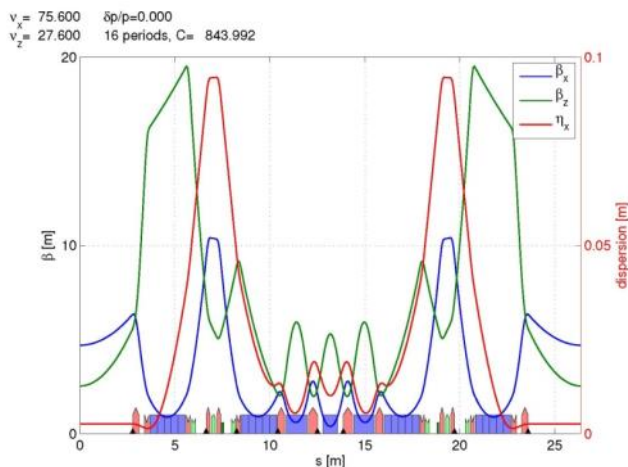
Looking to the future, the facility has just completed its 168 m€ Phase I Upgrade Programme (2009-2015), with the creation of 19 new experimental stations, a new 8,000 sq m experimental hall and the upgrade and renewal of the majority of equipment. New concepts for accelerators have also emerged in recent years [3],

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leading to the possibility of building a new generation of storage rings with an increase in brilliance of two orders of magnitude. Key areas of research would benefit from such a project, including coherent diffraction imaging and microscopy in the mesoscopic scale, spectroscopy with nanometre spatial resolution, and time-resolved studies in the millisecond to sub-nanosecond scale, together with a high power MHz laser pump-probing programme.

The ESRF has been one of the leaders in the development of these new concepts and, in 2015, launched its new and final development phase of the Upgrade Programme: the ESRF Extremely Brilliant Source Programme, or ESRF-EBS. This new programme is centred on the construction of a new storage ring that will adopt an all-new hybrid multi-bend achromat lattice design with an equilibrium emittance of about 135 pm-rad [4] – at least a factor of 10 better than any other synchrotron source of similar energy constructed or presently under construction and a factor 40 better than the present ESRF double-bend achromat lattice.



The new Hybrid Multi Bend Achromat lattice is expected to deliver X-ray beams to the ESRF beamlines with approximately 100 times increase in brilliance and coherence

The European and international ambitions that have been the basis of the ESRF’s success will continue in the realisation of this project, which, according to ESRF Director General Francesco Sette, is central to maintaining the facility in its key position on the international science scene. “I am convinced that the ESRF

is not only an excellent place to carry out science, but it is also an example of international collaboration and cooperation,” he says. “Therefore, we have the duty and responsibility to share our passion for science and technology with the widest possible community, to contribute to the advancement of knowledge across borders, and to inspire the new generations to perpetuate the ESRF’s legacy for many years to come.”



In 2015 the ESRF welcomed 12 female science students from Sweden as part of its Synchrotron@School outreach programme.

Credit: ESRF/C. Jarnias



The industrial exhibition, Netherlands@GIANT, was held to facilitate links between Dutch industry and R&D partners from the GIANT Innovation Campus in Grenoble.

Credit: ESRF/C. Argoud

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Francesco Sette, ESRF Director General, with Sekazi Mtingwa, member of the African Light Source Steering Committee, holding the African calling stick during the opening address of the African Light Source Conference.

Credit: ESRF/C. Argoud

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Indeed, the wheels perpetuating this legacy are already in motion. The spirit of international cooperation and exchange is evident in SESAME synchrotron in the Middle East, which will enter commissioning this year, and at the ESRF-hosted conference in November 2015 to build a roadmap towards the first African Light Source. It demonstrates now more than ever that science is an inescapable driver to peaceful relations among cultures and nations, a force for sustainability and a necessity in confronting the major challenges facing our world today.

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- [2] (www.greendiamond-project.eu)
- [3] Einfeld D., Schaper J., Plesko M., A lattice design to reach the theoretical minimum emittance for a storage ring, Proceedings EPAC 1996, Sitges 1996.
- [4] Farvacque L., et al., A low emittance lattice for the ESRF, International Particle Accelerator Conference, Shanghai, China (2013).

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A Synchrotron Light Source for Africa

Sekazi K. Mtingwa

After many discussions both within Africa and globally over the past fifteen years, momentum is growing for an African advanced light source. The formal movement started with the election of an international Interim Steering Committee for the African Light Source (ISC-AfLS). Organizers announced the newly elected members in August 2014 at the biennial *African School on Fundamental Physics and its Applications*, held at the University of Cheikh Anta Diop in Dakar, Senegal. ISC members, chaired by Simon Connell who was then at the University of Johannesburg, represented a geographically diverse set of countries, including Egypt, Ethiopia, France, Japan, Nigeria, Rwanda, Senegal, South Africa, Sweden, United States, and Zimbabwe. The role of the ISC-AfLS was to initiate a transparent, inclusive and democratic process, culminating in the First African Light Source Conference and Workshop that convened at the European Synchrotron Radiation Facility (ESRF) in Grenoble, France during Nov 2015.

Although organizers will convene most future meetings in Africa, for the first such gathering, the ISC chose the ESRF venue so that participants, such as students and policymakers not familiar with light sources, could tour an operating international flagship facility.

Three major outcomes emanated from the highly successful AfLS Conference and Workshop. First, participants adopted a set of overarching statements, called the *Grenoble Resolutions* that provide the *WHY* for an AfLS. Secondly, they adopted a *Roadmap* to guide future activities. Thirdly, organizers conducted an online election that established a fully mandated Steering Committee (SC), with Connell as Interim Chair, to replace the ISC. The charge to the new SC is to drive the *Roadmap* forward.

Grenoble Resolutions

- *Advanced light sources are the most transformative scientific instruments similar to the invention of conventional lasers and computers.*
- *Advanced light sources are revolutionizing a myriad of fundamental and applied sciences, including agriculture, biology, biomedicine, chemistry, climate and environmental eco-systems science, cultural heritage studies, energy, engineering, geology, materials science, nanotechnology, palaeontol-*

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Several of the researcher and student participants, who numbered close to a hundred. Two attendees hold traditional African ceremonial sticks. The larger stick metaphorically summoned the participants and “allowed” the opening of the Conference and Workshop. During the sessions, each speaker held up the smaller stick, which gave the authority to speak.

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ogy, pharmaceutical discoveries, and physics, with an accompanying impact on sustainable industry.

- *The community of researchers around the world are striving collaboratively to construct ever more intense sources of electromagnetic radiation, specifically derived from synchrotron light sources and X-ray free-electron lasers (XFELs), to address the most challenging questions in living and condensed matter sciences.*
- *The African Light Source is expected to contribute significantly to the African Science Renaissance, the return of the African Science Diaspora, the enhancement of University Education, the training of a new generation of young researchers, the growth of competitive African industries, and the advancement of research that addresses issues, challenges and concerns relevant to Africa.*
- *For African countries to take control of their destinies and become major players in the international community, it is inevitable that a light source must begin construction somewhere on the African continent in the near future, which will promote peace and collaborations among African nations and the wider global community.*



ESRF Director General Francesco Sette, with Sidiki Zongo. Sidiki is from Burkina Faso and is currently studying at the University of South Africa. Professor Sette and his leadership team enthusiastically supported hosting the meeting.

The *Roadmap* consists of activities in the short- (within 3 years), medium- (within 5 years) and long-term (5 years and beyond). Major activities in the short-term include training large numbers of African scientists, engineers, students and technicians in the design, operation and utilization of advanced light sources; establishing formal partnerships with existing international light sources; promoting the involvement of industry; establishing and enhancing Africa's current and needed critical feeder infrastructure that empowers light source science; promoting outreach and communication to policymakers and the public around light source based science; studying the feasibility of constructing African multinational beamlines at existing light sources, perhaps with partners from other regions of the world; developing a *Strategic Plan* for submission to African Ministries; and developing an AfLS non-site specific Pre-Conceptual Design Report, which specifies the scientific case for an AfLS along with its various components, including the accelerator complex, experimental beamlines and ancilliary facilities. Major activities in the medium-term include studying the feasibility of constructing an AfLS, including costs, and appointing a Task Team approved by African governments to develop a detailed Business Plan and Governance Model for an AfLS. Finally, in the long-term, the Roadmap calls for the completion of an AfLS Technical Design Report that includes site selection, and when approved by a sufficient number of African governments, the construction of a fourth generation synchrotron light source with requisite infrastructure.

The first call for a Pan-African light source was by the African Laser Centre (ALC), whose *2002 Strategy and Business Plan* specifies a synchrotron light source as one of its long-term goals. Headquartered in Pretoria, South Africa, the ALC is a nonprofit organization that consists of over thirty laser laboratories from across the African continent. Officially launched in Johannesburg in November 2003 during a Ministerial Segment of the New Partnership for Africa's Development's (NEPAD) *Conference on Science and Technology for Development*, NEPAD declared the ALC to be one of its *Centres of Excellence*. According to its *Strategy and Business Plan*, the goals of the ALC include providing financial resources, technical assistance and equipment loans to laser researchers throughout Africa; promoting

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collaborations among African laser researchers, as well as between African researchers and their international counterparts; providing financial support and training opportunities for students and technicians; facilitating technology transfer to industry of knowledge obtained from laser research and development; stopping the brain drain from Africa by providing competitive research facilities; and establishing flagship facilities, such as a synchrotron light source.



Awarding 87 research and educational grants during 2006-2013, the ALC has provided needed assistance resulting in its participants producing 151 articles in

refereed journals, 210 publications in conference proceedings, 12 book chapters, and 59 student theses. Moreover, between 2003 and 2013, 1249 students were trained in workshops, symposia and various short courses.

As argued by Herman Winick and the author in an article published on the lightsources.org Website entitled, *A Synchrotron Radiation Research Facility for Africa* [1], the time has come for Africa to invest in a light source. This is especially true if it is to solve problems endemic to Africa, such as Ebola and malaria. Africa is the only habitable continent in the world without a light source.

This situation must be remedied soon and there are models of international scientific cooperation that have already partially paved a path for that eventuality. Examples include the ALC, CERN, SESAME and the ESRF, with the latter being a collaboration of 18 European governments, plus South Africa and Israel, and has been in operation since 1992. Finally, UNESCO is the umbrella organization for both SESAME and CERN. Perhaps it could play a similar role for an African light source.

Reference

<http://www.lightsources.org/news/2014/09/05/synchrotron-radiation-research-facility-africa>

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Group photo of the ALC organizers taken in 2003. Second from the right on the first row is Philemon Mjwara, the first ALC Board Chair and currently Director General of South Africa's Department of Science and Technology.

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A session at the Second US-Africa Advanced Studies Institute held at iThemba LABS, outside Cape Town, during November 2007. That Institute, which is held periodically and is co-organized by the ALC, is the brainchild of Alfred Z. Msezane, who is from South Africa and is Professor of Physics at Clark Atlanta University.

Sekazi K. Mtingwa is an accelerator, nuclear and high energy physicist who also pursues nuclear energy policy, for which he received the 2015 Distinguished Service Award from the American Nuclear Society. He is a founding Board Member of the African Laser Centre, having served as Principal Author of its 2002 Strategy and Business Plan. As member of the AfLS Steering Committee, he chaired the writing of the Grenoble Resolutions and Roadmap. He retired from the faculties of MIT and North Carolina A&T State University and currently is Principal Partner at Triangle Science, Education & Economic Development, LLC in the Research Triangle of North Carolina.

Russian-American scientists meet in Washington, honor George Gamow

Vladimir Shiltsev

The Russian-speaking Academic Scientists Association (RASA, <http://www.dumaem-po-russki.org/>) is an international organization representing the Russian scientific diaspora. RASA is a nonprofit organization working to consolidate the Russian-speaking scientific community abroad, to advance the career development and qualifications of its members, and to provide opportunities for social and cultural exchanges. RASA represents over 500 members, including scientists, engineers and hi-tech entrepreneurs in academia, national laboratories and industry. More than half of the membership is in the United States, forming the Russian-American Science Association (RASA-USA <http://www.rasa-usa.org/>); the rest are in the European and Asian branches. The objectives of RASA include the exchange of knowledge and experience, initiation of joint projects, coordination of research programs, organization of conferences, seminars, research schools, sharing knowledge of teaching programs and lecture materials. More on RASA and its goals can be found in the December 2012 issue of “*APS News*” and in the fall 2013 issue of the “*APS FIP Newsletters*”.

We hold annual conferences and the 2015 RASA-USA Conference took place at The George Washington University (GWU, Washington, DC) on November 7 and 8, 2015. More than 160 scientists attended the conference which was sponsored by an “International Friends of APS Activity” grant. The APS sponsorship sent a strong message that RASA’s George Gamow session is very meaningful to both the American, the Russian-proper and the Russian scientific diaspora communities and that these events help to form “diplomatic links” which strengthen communication and collaboration among our physics communities. It is noteworthy that a very nice article “*Russian-American Scientists Honor George Gamow (1904-1968): Conference session celebrates physicist born 111 years ago*” by Emily Conover has been published in the APS News right after the Conference:

<https://www.aps.org/publications/apsnews/updates/gamow.cfm>

and, later, the link to it (with George Gamow’s photo) made it to the front page of the APS main website.

Indeed, the George Gamow session was the key scientific event of the 2015 RASA-USA Conference. Georgy Antonovich (in the US - George) Gamow was an outstanding theoretical physicist. He was born in the Russian Empire in 1904, received his education in the USSR, and became a corresponding member of the Academy of Sciences as one of the brightest representatives of the “new generation” of physicists. Gamow spent several years among a brilliant assemblage of physicists of the in-between-the-wars Europe and after immigration to the US in 1934, established a new school of physics in the United States. His career in the US spans more than three decades, including 22 years at the George Washington University in Washington, DC, and 12 years at the University of Colorado, until his death in 1968. The list of Gamow accomplishments includes several “Nobel-caliber” works - the theory of radioactive decay and nuclear transformations, the Big Bang theory, nuclear fusion and cosmic microwave radiation, proposition of the mechanism of the DNA double helix, and others. But for many contemporaries, and for many attendees of the Gamow’s session, his greatest influence on several generations of students, graduate students and people interested in science was his brilliant popular books. Particularly, a series on a hypothetical Mr. Tompkins, a clerk trying to understand the science behind various phenomena, a stunning book “*One, Two, Three ... Infinity*” explaining “how things work” to laymen and his sci-pop articles in magazines and newspapers. George Gamow’s life and works are fully consonant with the aims and activities of our association, and so it seemed natural that RASA-USA established the award named after Gamow. The award goes to scientists of the Russian diaspora who have made outstanding contributions to science and contributed to the strengthened international reputation of Russian science.

Amy Flatten, APS Director for International Affairs, opened Gamow’s session with a short welcome mes-

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sage about how the United States will remember and appreciate the contribution of Gamow and with gratitude for organizing the memorial RASA Conference. Professor William Briscoe, GWU Physics Department Chair, elaborated on the achievements of George Gamow - which he called the most outstanding scientist who has ever worked in the walls of his university - and on how GWU keeps up Gamow's scientific heritage, from a memorial plaque on the Physics Department building, to the commemorative meetings and support of the Gamow's studies, like, e.g., those conducted by Gamow's major biographer Prof. Eamon Harper of GWU.

The most entertaining part of the session was a presentation by George Gamow's son, Igor. Professor Igor Gamow, who flew to the conference from Colorado, gave a lively and interesting account of his father, showed several video clips about him and told a number of stories and anecdotes about George and his friends. The audience literally bombarded Igor with questions and did not want to let him go.

Scientific reports followed - first, Vladimir Shiltsev of the Fermi National Accelerator Laboratory (Batavia, IL) described several puzzling results of modern fundamental physics (from unexpected peaks in the data of the Large Hadron Collider, to the periodic variations of the measured gravitational constant, to the "Penrose rings" in measurements of cosmic microwave radiation of the universe as possible hints of previous reincarnations of the Universe before the Big Bang). Dr. Igor Moskalenko of Stanford University gave an overview of modern astrophysics including recent studies of high-energy cosmic particles, the Sun, stars and galaxies.

The session ended with the first-ever RASA-USA Gamow Award ceremony. There were two recipients - Professor Igor Efimov, a 1986 graduate of the Moscow Physical and Technical Institute, currently Chair of GWU's Department of Biomedical Engineering, for his work on the physics of the heart and contribution to the development of the Association (he was the first President of RASA-USA); and Professor Vladimir Zelman of the University of Southern California, a 1956 graduate of the Novosibirsk Medical Institute, for his contribution to the development of neurology and organization of medical research centers in Russia.

Ambassador of the Russian Federation to the US, Mr. Sergey Kislyak - himself a physicist, graduated from the Moscow Engineering Physics Institute - reminded the audience that at 28, George Gamow became the youngest member of the USSR Academy of Sciences. Then - after his emigration - was excluded from the Academy, but then in the 1990's was restored in the modern day Russian Academy of Sciences. Ambassador Kislyak remarked that George Gamow is the clearest representative of what he called "thinking in Russian" - the motto of the RASA Association.

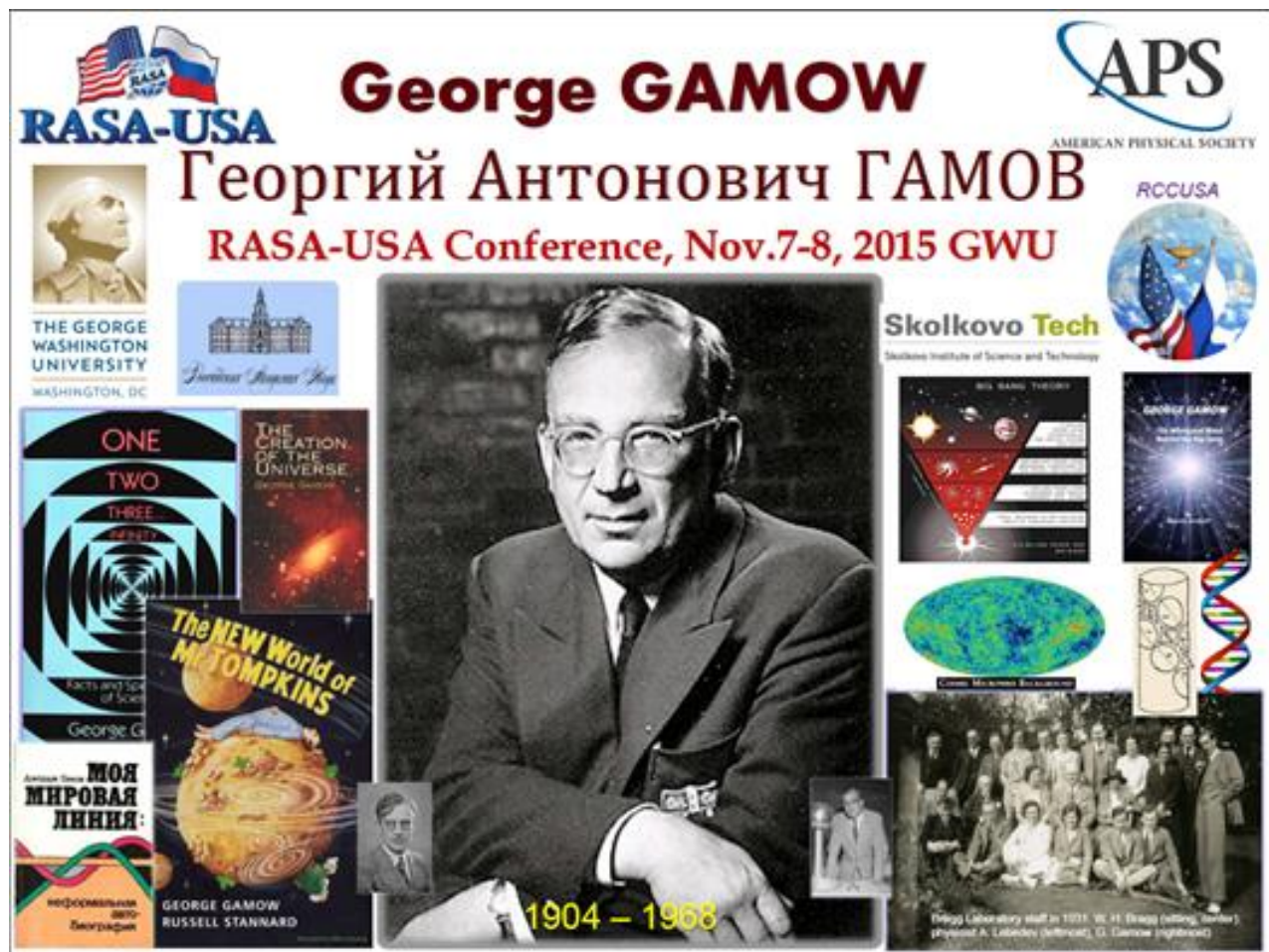
RASA is seeking new members - so, if you want to join, please, email us at mod.rasa.usa@gmail.com.



Prof. Igor Gamow, son of George Gamow (right), and Gamow's biographer, Professor Eamon Harper of GWU at the 2015 RASA-USA conference.

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Conference poster of the 2015 RASA-USA "George Gamow" conference (November 7-8, 2015)



2015 RASA Gamow Award ceremony (left to right): Dr. Vladimir Shiltsev (RASA President, Fermilab), Prof. Roald Sagdeev (UMD, physics), Dr. Nikolay Vasiliev (President RASA-USA, Harvard), Prof. Vladimir Zelman (2015 Gamow Laureate, USC), Prof. Igor Gamow (Colorado), Prof. Igor Efimov (2015 Gamow Laureate, GWU), and Ambassador Sergey Kislyak.

Vladimir Shiltsev is President of the Russian-speaking Academic Scientists Association (RASA) and Director of the Accelerator Physics Center, Fermilab, Batavia, Illinois

Ukrainian Physical Society (UPS) cooperation with the APS

Yaroslav Bazaliy, Mykhaylo Belogolovskii and George Gamota

The UPS and APS have a long record of working together since 1992 when a joint agreement on cooperation was signed by APS's Judy Franz and UPS founding president Viktor Baryakhtar. Most recently, efforts have been initiated to help the displaced physicists and in general to help UPS members become more engaged with their Western colleagues. At the beginning of 2015 a group of Ukrainian and American physicists discussed ways of helping their colleagues from the Donetsk and Luhansk regions that were displaced due to the military conflict in the East of Ukraine. Concurrently, George Gamota brought the dire situation in Ukraine to the attention of APS International Affairs Director Amy Flatten, and a plan of action was agreed upon. This included aid to physicists in Ukraine, and enhancing fruitful collaboration between APS and UPS members. The goal was to team up with each other to jump-start projects that can later become ongoing and self-sufficient. We would like to report on some successes already achieved and outline a few additional efforts being undertaken. Two publications about the difficulties that physicists in Ukraine are currently facing appeared in the April 2015 issue of *APS News* and the August 2015 issue of *Physics Today*. To date, the APS has provided free membership to the Ukrainian physicists relocated from the East of Ukraine and initiated awareness of different services that are available from various APS activities. This is not only highly

appreciated by many displaced physicists but also by the general UPS membership.

Additional support for the Ukrainian displaced scientists came from CRDF (Civilian Research and Development Foundation) Global, a US non-profit organization that promotes international scientific and technical collaboration through grants, technical resources and entrepreneurial training. In 2016, CRDF Global will carry out competitions under its ongoing program of support of Ukrainian and US scientists joint research projects and the S&T entrepreneurship program. CRDF Global will pay special attention to participation of displaced scientists in these programs. Recently, CRDF Global established an Emergency Fund for Ukrainian Scientists for accumulating charitable contributions and other resources with the goal to help scientists relocated from the East of Ukraine. CRDF Global anticipates that through this Fund, US scientists and laboratories will have a possibility to help their Ukrainian colleagues.

On October 12th, 2015 George Gamota met with UPS President Maksym Strikha who also is the current Deputy Minister of Education and Science, Natalia Artiukhovska, CRDF Global Representative in Ukraine as well as a group of displaced scientists to discuss the scope of cooperation. Strikha outlined the steps that the Ukrainian government has taken to help the 12,000 scientific workers from 26 universities and institutes temporarily evacuated from areas outside the control of the Ukrainian government. While the people were displaced and are safe, he emphasized that all laboratory equipment, libraries, and other assets in these institutions remained in the occupied cities and the Ministry is making great efforts to offset these losses. For example, the UPS with the assistance of the Italian Physical Society opened a new computer lab for the physical-technical faculty of the Donetsk National University, temporarily housed in Vinnitsa, a city in central Ukraine.



Meeting on October 12 to discuss joint programs between the UPS and APS. From right to left: Mykhaylo Belogolovskii, Olha Gornostaeva, Maksym Strikha, George Gamota, Natalia Artiukhovska, and Gennadiy Akimov.

We cite two initiatives that are being developed and will be continuing as a result of the APS-UPS collaboration.

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Technology Transfer and Entrepreneurship in Physics

The interest in physics as a career path is currently decreasing in Ukraine. One of the main questions which have become important for the physics community is what can be done to ensure physics education is useful for society. In the post-Soviet countries physics and mathematics graduates traditionally keep seeking purely academic basic research careers, while the world has rapidly changed and has moved towards commercial applications of physics in fields such as alternative energy sources, nano-technology, quantum information, biophysics and medical devices. The future of our discipline depends not only on providing a first-rate basic understanding of physical principles, but also training in what is increasingly the largest employment base for the physicists worldwide - the private sector, particularly high-tech start-ups. This means that physics-based entrepreneurship courses should find their way into university programs, and established scientists should be encouraged to turn towards the needs of industry. Entrepreneurial skills provide an alternate career choice for young physicists.

Through APS we have learned about the joint initiative of the APS, the Institute of Physics, and the Abdus Salam International Centre for Theoretical Physics in conducting such workshops on Entrepreneurship for Physicists and Engineers from Developing Countries. The workshop takes place at ICTP, Trieste every other year. The same team of experts has conducted similar regional workshops in about fifteen developing countries all over the world. The objectives of this one-week intensive meeting are to introduce to the scientists the key concepts of intellectual property, technology transfer and commercialization of inventions. Our plan is to initiate and conduct a similar workshop in Ukraine. At the moment, together with the organizers of the Trieste workshop we are looking for sponsors and are formulating its policy, program and aims. The long-range plan would be to extend this into a set of seminars and workshops for scientists working in academic institutions and universities in order to familiarize them with the tools necessary to take an idea from research to commercialization, the process of innovation, genera-

tion and protection of intellectual property, etc.

Internet-seminars (Webinars) for Physicists in



Organizers of the first joint webinar on November 12. From left to right: Yaroslav Bazaliy, Mykhaylo Belogolovskii and Olena Zhitlukhina.

Ukraine

Another important project that has been started is to promote integration of young Ukrainian researchers into the Western scientific community. Besides the obvious intellectual value, better integration has a clear potential for improving support prospects. In 2015 Ukraine became a full member of the European Commission grant program, Horizon 2020. While technically Ukrainian scientists, physicists in particular, can now utilize the same grant opportunities as any one of their European colleagues, in reality they are still hindered by many obstacles. A big one is the lack of experience and reputation within the European Commission grant system or, more broadly, lack of day-to-day collaborations with physicists from abroad. An average young researcher or graduate student in Ukraine can download and study any paper from the leading physics journals. However, the odds of him or her being present at a live talk given by a foreign physicist are slim. Visits and scientific exchanges occasionally happen, and some exceptional Ukrainian groups are well represented worldwide. But on average, scientific contacts have not reached a critical intensity. All this creates a very palpable cultural disconnect between Ukrainian scientists and the Western scientific community, a situation that should be changed as soon as possible.

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Bridging this gap is a complex task to be approached in many ways. One of them is taken by a UPS pilot program offering internet-seminars with speakers from everywhere in the world presenting fresh results to Ukrainian audiences. Internet seminars (or webinars) are a natural inexpensive alternative to physical travel of the speaker. Of course, the question is how good such an alternative can be, and whether it can actually ensure enough scientific discussion and stimulate people-to-people interactions. On the technical side, APS generously offered its own webinar platform for the program. Working with Amy Flatten from the APS office on International Affairs and Sara Conners from the web management we were able to start using a very good webinar software suite right away. The UPS seminar coordinators could then concentrate on speaker invitations, advertising, and seminar organization. Notably, a very interesting aspect of a webinar is the way in which the attendees are encouraged to participate and devote their full attention to the talk. The first few seminars of the series have shown that some tricks employed by us seem to work and produce better interactivity. UPS now plans to continue the series to popularize it and increase participation. It seems that similar attempts are made throughout the world, by informal organizations, such as Latin American Webinars on Physics (<http://www.sbfisica.org.br/noticias/anuncios/msg.php?id=4243>), and by established institutions, such as the Perimeter Institute (<http://pirsa.org>).

Eventually the goal of the program is to trigger a proliferation of on-line seminars in Ukraine. With the technical details worked out during the pilot program, it will become easy to start a local seminar series and concentrate on inviting the best speakers in the world working in a given field. Such seminars will certainly make Ukrainian physicists one step closer to their western colleagues. How decisive will this step be? Quoting a wonderful theorist, M. I. Dyakonov, “the key aspect of the future is that it is unpredictable.” (<http://arxiv.org/abs/cond-mat/0401369>)

A description of the program can be found at <http://boson.physics.sc.edu/~yar/UFT/>

Perspectives

In our opinion, now it's a time to forge and deepen relations between existing research groups of Ukrainian

physicists and their foreign colleagues, including Ukrainian Diaspora. How to arrange the team-to-team cooperation is the problem the UPS is discussing now. We will highly appreciate new ideas and suggestions on that matter from the FIP members. For example, one can think about three-way international collaborations between physicists from the US, Ukraine, and developing countries in Asia or Africa. We believe that in the integrated global world Ukrainian physicists, despite their present plight, could act as effective and wanted partners for their colleagues abroad.

For further information please contact us.

Yaroslav Bazaliy is an Associate Professor at the Department of Physics and Astronomy at the University of South Carolina. His research work is in the area of spintronics, and he actively explores new methods for remote collaboration and internet-based instruction. Yaroslav received his Ph.D. from Stanford University. yar@physics.sc.edu

Mykhaylo Belogolovskii is the head of the Joint Laboratory of Dynamics of Electronic Processes in Hybrid Structures established by the G. V. Kurdyumov Institute for Metal Physics, National Academy of Sciences of Ukraine in Kyiv and the Donetsk National University relocated to Viinnytsia due to the military conflict in eastern Ukraine. He is a coordinator of the Ukrainian-American working group on aid to physicists relocated from the Donetsk and Luhansk regions that was initiated by the UPS in 2015. belogolovskii@ukr.net

George Gamota is a Senior Fellow of the APS and a Foreign Member of the Ukrainian Academy of Sciences. He was a former member of the Bell Labs technical staff, founding Director for Research at the Department of Defense and professor of physics at the University of Michigan. He specializes in benchmarking foreign S&T and entrepreneurship. He is the founder and current president of Science and Technology Management Associates, STMA LLC. ggamota@STMA-LLC.com

The Malta Conferences

Frontiers of Science: Research and Education in the Middle East

Morton Hoffman and Zafra Lerman

With the terrorist massacres in Beirut and Paris, the ongoing killings in Israel and the West Bank, and the encroachment of ISIS into the area as the immediate backdrop, the seventh biennial Malta Conference (Malta VII) on research and education in the Middle East was held at the Sofitel Hotel in Rabat, Morocco, on November 15-20, 2015.

The six previous Malta Conferences were held in Valletta, Malta (2003, 2005, 2013), Istanbul, Turkey (2007), Amman, Jordan (2009), and Paris, France (2011 at UNESCO headquarters as part of the celebration of the International Year of Chemistry). The Malta Conferences Foundation (MCF), a 501(c)(3) charitable organization incorporated in Washington, DC, organizes the Conferences and raises money for support.

The continuing horrifying events within the Middle East and around the world provoked an increased determination to the more than 90 participants at Malta VII to unite with one another to build collaborations as a bridge to peace. With scientists and science educators from universities and national institutes, including students and early-career scientists, from 15 Middle East and North Africa (MENA) countries (Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Morocco, Palestinian Authority, Qatar, Saudi Arabia, Syria, Turkey, and the United Arab Emirates), as well as speakers and conference organizers from U.S. and Europe, the Conference featured plenary lectures by four Nobel Laureates, workshops on topics of importance to the participants from the region, oral and poster presentations, and ample time for everyone to make personal and professional connections.

Amazingly, given the declared and undeclared states of war and political animosities among the MENA countries, only one person, a representative from Libya, was denied a visa to enter Morocco. Even the Syrians and Iraqis, who received their visas on the day before the Conference was to begin, managed to come and tell us first-hand about the hardships they encounter on a daily basis in order to maintain their scientific research as well as the obstacles they faced in order to travel to Morocco.

The plenary lectures were given by the following Nobel Laureates: Ada Yonath (Israel, 2009), *Borderless Science*; Dan Shechtman (Israel, 2011), *Technological Entrepreneurship, Key to World Peace and Prosperity*; Roald Hoffmann (U.S., 1981), *Two New Games for Carbon*; Martin Karplus (U.S., 2013), *Motion: Hallmark of Life From Marsupials to Molecules*.

Presentations were also made by Yvonne Pope (Chemical Abstracts Services, U.K.), *SciFinder – The Choice for Chemistry Research*; Olli Vuola (Aalto University, Finland), *Entrepreneurship and Innovation*; Nicholas Anthis (U.S. Agency for International Development), *The Middle East Regional Cooperation (MERC) Program*; Leiv Sydnnes (University of Bergen, Norway), *Chemical Safety and Security*; Jonathan Forman (Organization for the Prohibition of Chemical Weapons, The Netherlands), *Educational Resources From OPCW*; Fadila Boughanemi (European Commission on Research and Innovation, E.U.), *Builds Bridges Through Science Diplomacy*; Mohamed Ismail (Ain Shams University, Egypt), *Software Demonstration of Molecular Modeling and Computer Aided Drug Design*; Donna Nelson (President-Elect, American Chemical Society), *The Science Behind “Breaking Bad.”*

Greetings were offered at the opening ceremony by Zafra Lerman (President, MCF), Rachid Benmokhtar Benabdellah (Minister of National Education, Morocco), Dwight Bush, Sr. (U.S. Ambassador to Morocco), Karen Betts (U.K. Ambassador to Morocco), Anne Vasara (Finland Ambassador to Morocco), Are-Jostein Norheim (Norway Ambassador to Morocco), Lahcen Haddad (Minister of Tourism, Morocco), Fadila Boughanemi, and Donna Nelson. Evening receptions were held during the week at the residences of Ambassadors Bush, Vasara, and Norheim. The Moroccan Ministry of National Education, the Academy of the Kingdom, and the Hassan II Academy of Science and Technology hosted a farewell cocktail dinner.

The following multi-session workshops, which were chaired by the listed organizers, were held:

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Organic, Organo-metallic, and Medicinal Chemistry:
Cathy Costello (U.S.), Masoud Mehrgardi (Iran),
Mohammed El-Khateeb (Jordan)

Energy, Materials, and Nanotechnology for Resource Sustainability: Marwan Mousa (Jordan), Ron Naaman (Israel), Pierre Karam (Lebanon)

Environment: Air and Water Quality: Chuck Kolb (U.S.), Abdelrahman Alamarah Tamimi (Palestinian Authority), Abdallah Husein Malkawi (Jordan), Yossi Guttman (Israel)

Science and Technology Education: Rachel Mamluk-Naaman (Israel), Morton Hoffman (U.S.)

A total of 54 oral presentations were made during the workshop sessions; 21 posters were on display throughout the entire meeting. At the end of the conference, the workshop organizers provided summaries of the talks and discussions in their sessions. Proposals were presented for future actions, including the continuation of existing collaborations on water and education, and the development of new ones, the dissemination of the information from the workshops to a broader audience, and the search for funding to provide research and international exchange opportunities for students and faculty. In the closing session, the participants, many of whom had attended previous Malta Conferences, enthusiastically endorsed the motion that Malta VIII be held in 2017.

The members of the MCF Board of Directors who attended Malta VII were Zafra Lerman (President, U.S.), Ann Nalley, (Vice President, U.S.), Iona Black (Secretary, U.S.), Morton Hoffman (Treasurer, U.S.), Cathy Costello (U.S.), Chuck Kolb (U.S.), Leiv Sydnes (Norway), and Hassan Bazzi (Qatar).

The following were co-sponsors of Malta VII:

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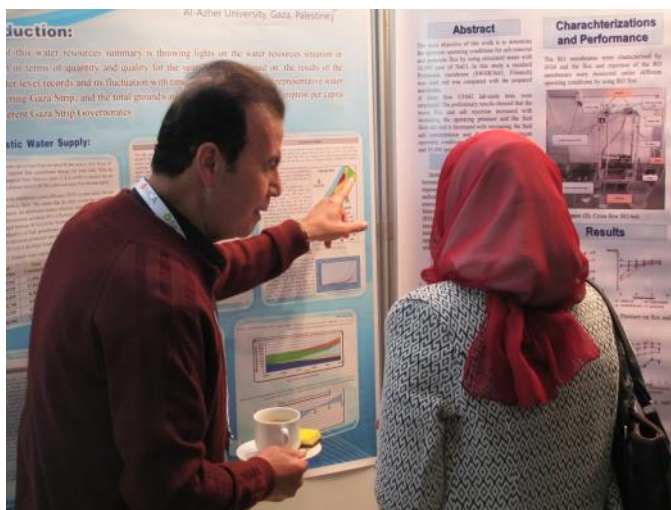
American Chemical Society (ACS)

ACS Division of Chemical Education (CHED)

American Association for the Advancement of Science (AAAS)
Terrific Science
Alexander von Humboldt Foundation



Distinguished guests: (from the right) Rachid Benmokhtar Benabdellah, Minister of National Education and Vocational Training, Morocco; Dwight L. Bush, Sr., U.S. Ambassador to Morocco; Karen Betts, U.K. Ambassador to Morocco; Anne Vasara, Finland Ambassador to Morocco; Are-Jostein Norheim, Norway Ambassador to Morocco; Fadila Boughanemi, European Commission of the E.U. Not in the picture: Donna Nelson, ACS President-elect.



Yousef Abu Mayla (Al-Azhar University, Gaza, Palestinian Authority) explaining his poster on "Water Situation in the Gaza Strip 2015."

More information about MCF and the Malta Conferences is at <http://maltaconferencesfoundation.org/>.

Zafra Lerman is President and Morton Hoffman is Treasurer of the Malta Conferences Foundation. Lerman is the winner of the APS Sakharov Prize for 2016.

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Deadline for contributions to the Fall 2016 Newsletter is August 15, 2016

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