



Letter from the Editor



Dear FIP Members,

Welcome to this spring/summer 2018 issue of the Forum on International Physics!

Here you can find detailed reports on our sessions at the March and April meetings 2018 and on other FIP's activities.

This year, the FIP Nominating Committee, chaired by Past Chair Cherrill Spencer, has received a good number of nominations for the positions on the FIP Executive Committee that will be filled by an election this coming September. They are evaluating the nominees to choose whom to put on the election ballot for Vice-chair, Secretary/Treasurer and Member-at-large (two positions). Please cast your votes when you receive the election ballot by email in late September; The future direction and effectiveness of this

forum depends on you voting for the candidates you prefer!

I would like to thank the many FIP members who support our Unit, either by serving on FIP committees and our Annual Meeting or in countless other ways. Their efforts are essential for the continued vibrancy of our international community. Thank you again!

Don't forget to send me your contributions and suggestions for the next issue of the FIP newsletter!

I hope to see you all at our next APS meetings!

My warmest best wishes to you all,

The Newsletter Editor
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Message from FIP Chair Jerry Peterson



International tensions are rising again, with talk of trade wars, perceived threats from immigration, and restrictions on human movements among nations. This is a change from the atmosphere in which we have carried out our thriving global physics programs in recent decades.

We physicists are not a major voting bloc nor an obvious component of any economies, and so cannot expect much

direct influence on decision makers. But we can set a continuing good example of how cooperation and collaboration among humans leads to win-win intellectual successes, for the participants and for the national societies in which they live.

Consider the recent neutron star merger, first identified by the detection of gravitational waves. The third detector, VIRGO in Italy, did not see the gravitational wave. This was vital since the non-observation was due to a dead spot in the VIRGO angular sensitivity. Spherical trigonometry, just as practiced by sailing masters with their sextants, could thus give quite accurate directions in which to look. Quickly, remarkably quickly, a wide range of electromagnetic sensors around the globe were able to see the photons that emerged from that merger.

We, all members of our species, learned much from this wide bandwidth of observations, which offers a good analogy for FIP. Humanity evolved among a wide range of social environments, which must have influenced how individuals see and think. This is a wide bandwidth of seeing and thinking, and as physicists, we can use

this for new insights, or even methods of gaining insights. Only by establishing connections, best as face-to-face, can physics gain the benefits of thinking bandwidths.

Also of course, the costs of carrying out our studies have become obvious to these decision makers, who should also see the financial advantages of collaboration. Trade wars and restrictions on sharing technologies will certainly have a great impact on the way we carry out many physics projects. We must make clear the many advantages to all of us in our intellectual collaborations.

How can FIP help physics and physicists navigate the new times? We have our invited sessions at APS meetings, which can serve as splendid examples of successes based upon the talents of all of us. We can even have good metrics, of papers with wide-ranging co-authorships, and even occasional headlines such as gravitational waves. The examples of such invited sessions is covered elsewhere in this newsletter, so can may judge for yourself if we are making any gains. FIP also sponsors and organizes international travel for young people via our Distinguished Student Program, and IRTAP, which provides at least seed money for international collaborations. These programs could grow, in volume and in impact, if we can access wider financial support from among other APS units.

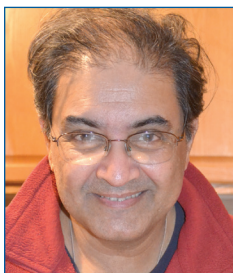
Our craft of physics has a huge advantage over even other scientific endeavors, since we have attained a superconducting state in recent years. Data, questions, tentative answers and such now propagate at c , using the bandwidths of modern technology. And, most of this traffic is even in English! FIP has many advantages, and must continue with all of our established programs, and to seek new ways of aiding the global quest for understanding of our universe, on all scales of length and time, using all available talent.



FIP executive committee (partial) and Amy Flatten & Kate Kirby at the ExComm 2018

Physics Teaching in Gateway Classes: A Global Perspective

Surajit Sen, State University of New York at Buffalo



This Forum on International Physics (FIP) invited session was on Wednesday, March 7, 8-11am, at the Los Angeles Convention Center. The session focused on challenges associated with teaching freshmen and sophomores as they go through the gateway courses in physics. Being at a FIP session, there was particular emphasis on the challenges faced in the US institutions, and in those outside the US. The session was

slated to have 5 invited speakers. However, Professor S. Minhaz Hossain of the Department of Physics, Indian Institute of Engineering, Science and Technology was unable to come due to visa related delays. The 4 talks that were presented considered a broad array of issues that we face locally and globally in teaching gateway physics courses.

The first lecture was presented by Professor David J. Helfand of the Department of Astronomy and Astrophysics at Columbia University and a past president of the American Astronomical Society. Professor Helfand has made significant contributions to developing effective and engaging methods in undergraduate education at Columbia and as a professor, vice chancellor and President of Quest University in Canada. His talk, contextualized via “Deriving Kepler’s Laws as Kepler Did—From (simulated) Noisy Data” brought up the issue of how limited learning in a traditional classroom can typically be and what may be the ways in which students can learn through active engagement, collaboration, field experience and practice, a style he was deeply involved in realizing while at Quest (see D. J. Helfand, “Mucking about in the mess: research-based education at Quest University Canada,” Council on Undergraduate Education, Vol. 36, No. 2, pp 28-34 (Spring, 2016)).

Dr. Daniel Siegel is the executive director of the Mindsight Institute and a clinical professor of psychiatry at the UCLA Medical School. His training is in pediatrics and in child, adolescent and adult psychiatry. An expert on mindfulness, Dr. Siegel is a celebrated author and psychiatrist. His writings include three *New York Times* best-sellers, “Brainstorm: The Power and Purpose of the Teenage Brain,” and with Tina Payne Bryson, “The Whole-Brain Child: 12 Revolutionary Strategies to Nurture Your Child’s Developing Brain” and “No-Drama Discipline: The Whole-Brain Way to Calm the Chaos and Nurture Your Child’s Developing Mind.” His lecture touched upon the essence of adolescence as one with the emotional spark, different abilities than adults for social engagement, a phase when one is novelty seeking and also with tremendous ability for creative exploration. Dr. Siegel’s talk was all the more relevant because adolescence is a phase most beginning college students are in when they find themselves in the physics classrooms. His talk emphasized how important it is to be able to supercharge the creativity and ingenuity of the adolescent brain and how readily one can temper this energy. His words shed light on the importance of being creative and engaging in teaching these young students. This lecture was followed by a lively discussion on mindfulness, creative energy and consciousness. Dr. Siegel reminded the audience that humans may not have survived all these years if it were not for the creative energy of the adolescent brain!

Professor Jason Hafner of Rice University gave a detailed overview of his experiences in teaching gateway level physics to a global audience as a massive open online course (MOOC) offered on the well-known edX (<https://www.edx.org>) platform. In addition, he also taught the class as a regular lecture course at Rice University. His talk was titled, “International student experiences in Introductory Physics MOOCs.” He used a physics textbook from the openstax.org site which has been pioneered at Rice University. The homework was done online. While the Rice course was a regular course like in most universities, the MOOC was not in real-time and was continuously used on the edX platform even after the course was completed at Rice. The online site had some 180,000 sign ups worldwide from almost all the countries of the world, though the majority were from the US, India, Canada and the UK. Of these, some 3,300 students completed his online course and some 1400 responded to his surveys. The majority of the students indicated that they took the MOOC for fun! A great many also indicated that they benefited from the online lectures even though they were pre-recorded. Many students felt it would have been desirable to have had interactive lectures. According to Professor Hafner’s surveys, a great many students continued with their intended curriculum after having completed the introductory MOOC. The surveys indicated that the student body appreciated the free resources that were made available as part of the MOOC. The students indicated a desire to see more difficult problems, more practical problems and also problems with video solutions. They also expressed a desire for a schedule for completion of the course. Professor Hafner concluded that it may be beneficial for student learning if the teachers incorporated its contents as a resource into their courses.

The final presentation was done by Professor Mulugeta Bekele from Addis Ababa University in Ethiopia who focused on the past and current challenges of teaching physics to Ethiopian students. The talk ended with a broader discussion on the state of physics education in Ethiopia and in much of the African continent. The issue of focusing on physics in Africa as a topic of regular consideration in the March Meeting was suggested during the broader discussion.

The discussions in Professor Bekele’s talk centered on how Ethiopia has seen its share of political change through the twentieth century. After some 1700 years of traditional elitist education under the influence of the orthodox church, secular higher education took its roots in Ethiopia in the 1950s (see for example, A. Bishaw and S. Melesse, “Historical analysis of the challenges and opportunities of higher education in Ethiopia,” *Higher Education for the Future*, Vol. 4, Issue 1, pp 31-43 (2017)). The several colleges and universities in existence in Ethiopia were mostly organized under the Haile Selassie I University in 1961. However, the enrollments remained very low (e.g., enrollment in institutions of higher education were some 4500 in 1970 out of a population of 34 million, among the lowest in the world). The socialist military coup of 1974 led to the rise of the Derge regime and the name change of Haile Selassie I University to what is now known as the Addis Ababa University. This was a tumultuous time in Ethiopia’s modern history. In spite of it all, the higher education system expanded, graduate programs were developed and the number of women in higher education increased from around 10% in 1986 to some 16% by 2000. Ethiopia

has tried to increase the number of teachers by arranging to train them in the Indian Institutes of Technology (IITs), the University of Delhi and other institutions in India. Regardless problems remain with low enrollments and brain drain to developed nations. In all, it has been a challenging journey for Ethiopian science to the twenty first century and a great deal needs to be urgently done for Ethiopian science and physics to be robust enough to serve the nation's needs.

This FIP session hence turned out to be rather unique. Professor Helfand's talk touched upon how to effectively engage and educate the typical adolescent student in gateway physics courses in a way that they can associate with what they are learning and discover it for themselves. Dr. Siegel's talk gave a peek into the workings of the adolescent brain and how important it is to connect with the

creative energy at this period of the student's lives. Professor Hafner's lecture brought up the intriguing possibilities associated with offering physics courses on a global scale whether it is for credit or as a learning resource to enhance the material that the student needs to take as a part of some curriculum. And finally, Professor Bekele's lecture took the audience to the realities and challenges of physics and science education when nations face poverty and large scale and rapid socio-political change. We came off humbled by the challenges of teaching gateway classes. We became more aware of the difficult situations students face in learning physics in many parts of the world. In closing we hope that this session's discussions on being aware of the student's preparedness and maturity, our individual ability to communicate, and almost everyone's ability to use the internet can make physics education accessible to all.

Some Highlights from the April Invited Session: Progress and Challenges for Women Physicists in Africa, Asia and the Middle East

Cherrill Spencer, Past Chair of FIP



FIP invited three senior women physicists to come to Columbus, Ohio to tell us about the progress and challenges for women physicists in parts of the world distant from the USA where you might have thought there were no women working in physics, or not enough to generate any statistics. This article reports some of the many interesting facts we learned during this invited session X06 at the APS April 2018 meet-

ing. All three slide presentations are posted on the APS website and their URLs are given below.

The first speaker was Professor Ibiyinka Fuwape, Vice Chancellor of Michael and Cecilia Ibru University, Delta State, Nigeria. The Vice Chancellor (=the University's CEO) is the winner of this year's APS Marshak Lectureship. She is also a theoretical physicist specializing in nonlinear dynamics and has been Nigeria's Team Leader for the International Union of Pure and Applied Physics (IUPAP) Working Group of Women in Physics (WIGWIP) since 2002. She has attended all six International Women in Physics Conferences where she presented Nigerian efforts to encourage more women to stay with careers in physics.

Fuwape's talk was titled "Women in Physics in Nigeria and other sub-Saharan African countries: Progress and Challenges". She pointed out there are 46 countries in sub-Saharan Africa and she presented information on women physicists in the following: Nigeria, Ghana, Kenya, Tanzania, Uganda, Zambia, Zimbabwe and South Africa. Many African governments have realized the need to harness the contribution of their women population in scientific fields and therefore are putting in place mechanisms to encourage and retain more women in science in general. Fuwape mentioned several programs for interesting girls in physics and keeping women in physics, for example younger women physicists are being mentored by older women using "Whatsapp", a popular social media platform. Nigeria has held three "Women in Physics" conferences

since 2011. Their "modest" efforts have yielded some results including three Nigerian women physicists winning Elsevier Foundation Awards for Women Scientists in the Developing World in 2015. To see some statistical data and descriptions of other programs look at Fuwape's slide presentation here: <https://absuploads.aps.org/presentation.cfm?pid=14321>

A problem with the education systems in most African countries is that large fractions of the girls' population do not go to school, at least not past 10-11 years old. To deal with this Ghana has set up science clinics for girls where they do hands-on activities, meet women role models and take excursions to places of scientific interest. Kenya now has free primary education and subsidized secondary education which has led to higher enrollment of girls in both primary and secondary schools. Kenya has set up the Kiriri Women's University of Science and Technology, which is the only Female University in East, Central and Southern Africa. The number of women physicists in Tanzania has been very low; the lack of job opportunities reduces the interest of students in studying physics. Nevertheless the female physicists at the University of Dar es Salaam have organized outreach activities such as : high school visiting, giving invited talks at prize giving day ceremonies, inviting students to attend a research week at the University, and science camps for A-level science students with their teachers. In Uganda It is hoped that with the introduction of scholarships that include women after the child bearing age, more women can pursue higher degrees in physics. The lack of job opportunities in Zambia and Zimbabwe keeps down the number of women studying physics, they are afraid of unemployment. Of the 13 universities in South Africa with departments of physics all but one have at least one woman on the faculty; the promotion of women physicists along the career ladder proceeds slowly and a Women in Physics in South Africa Association was set up in 2006 to improve the climate for women.

The second speaker in session X06 was Professor Rohini Godbole, she is a theoretical particle physicist and a professor at the Centre for High Energy Physics at the Indian Institute of Science in Banga-

lore, India. Her talk was on “Women Physicists in India and other Asian Countries”. She has been very active in the topic of women in science, especially since the first IUPAP international conference on women in physics in 2002 where she was an invited speaker. Subsequent to her participation in that conference she founded the Women in Science Panel of the Indian Academy of Sciences (Bangalore), and brought out a study report on Women in Science in India on behalf of the Indian National Science Academy. Her presentation (her slides can be reached here: <https://absuploads.aps.org/presentation.cfm?pid=14234>) covered the status of women in physics in India, Australia, Japan, Korea and Taiwan. She noted there are cultural and economic differences among these countries and that those differences affect the participation of women in physics and the efforts to improve the numbers.

In India the participation of women in *studying science* or for that matter in *teaching science*, at all levels, is not low at all. However, the number of women doing science is much smaller than the other two cases. Further it is even less when one considers decision making positions in this context or even presence in the more elite Indian institutes. In 2016 40% of all the Ph.D’s (all subjects) were women!

In India the pot starts leaking AFTER the Ph.D. Women have 20-25% of the tenured jobs and grants in physics but the fraction in elite institutions is less than 5-10%. The number of women in the Indian Academy of Sciences is gradually increasing, it is now 12 out of 209; the number of women principal investigators is also increasing.

Godbole considered the two types of remedies to improve this situation: policies and societal attitudes.

One set of policies has dealt with helping women come back into the physics workforce after a break, or using role models to show that they didn’t need to leave in the first place. In order to gather data so as to design solutions to the problem of trained women leaving science the Women in Science Panel (WISP) of the Indian Academy of Sciences carried out a survey of many Indian women scientists. The conclusions were: a large fraction (about 50%) perceive family responsibilities (child care/elder care) as the major reason for not continuing in Science, but a substantial fraction (20%) also pointed to disabling organizational factors (lack of women mentors/colleagues, lack of women friendly policies at work place etc.) as a reason. The survey’s report can be read here: www.ias.ac.in/womeninscience/surveyreport_web.pdf. In 2004 the WISP asked 100 successful women scientists who worked in modern India to write what helped and hindered them: “Lilavati’s Daughters” is the title of the resulting book, it has been translated into many Indian languages. Godbole and others have also edited a book for young girls called “The Girl’s Guide to A Life in Science”. Descriptions of other Indian programmes and efforts to change policies can be found in Godbole’s slides.

The statistics of faculty women in natural and physical sciences in Australia show the same decreasing percentages of women as observed in all countries as one looks at junior lecturers through full professors. There was no increase in these percentages from 2001 to 2012 and recently Australian universities have started a new program called SAGE: Science Australia Gender Equity, which is a more concerted approach to increasing the participation of women in science.

Using the percentage of women who are members of the Japanese Physics Society (JPS) as an indication of their general participation in physics in Japan we see much lower numbers than in other Asian countries: 2% in 1985 increasing to 5% in 2009. A new program called ATHENA: Acceleration of Theoretical and Experimental Research Networking for Career Advancement of Women in Physics, has set up special symposia and mentoring workshops to improve this participation.

In Korea 38% of the science Ph.Ds are awarded to women, but the percentage in physics is much smaller. The Korean government has several proactive schemes to change this situation, starting with encouraging high school girls to study physics. Although about 19% of the scientific workforce is women, they occupy 33% of the non regular positions. The Korean culture plays a big role in the employment of women: considering all the sciences 84% of unmarried women continue in the scientific workforce after their higher education, but only 50% of married women continue working. The Korean government has some special schemes and incentives in place, hoping to reach 30% women in the scientific workforce by 2020. In Taiwan there is the usual reduction in the fraction of faculty women in higher-up positions, but the fraction in lower positions has been increasing over the years. The Taiwanese Government has taken special measures such as extending the tenure clock for women, and special grants. Godbole’s overall conclusions are, the Asian countries she investigated have populations of women physicists and astrophysicists ranging from less than 5% in Japan to 20-25% in India. The fractions at higher level academic positions are much smaller than the junior positions but in all countries there is a rising trend; needed changes in societal attitudes and policies are happening too.

The 3rd presentation was on “The Status of Women Physicists in Egypt and the Middle East” which was prepared by Emerita Professor Mona Mohsen of the Physics Department in the Ain Shams University, Cairo, Egypt. Professor Mohsen has engaged in a wide range of physics subjects since she earned her Ph.D in experimental nuclear physics at the Technical University in Dresden, East Germany in 1976. For example she has measured the radioactivity dose around ancient monuments and prepared flame retardant polymers for cable insulation applications. She has been recognized with various prizes from her university. She has been the team leader for the IUPAP’s Women in Physics of Egypt since 2014. Unfortunately Professor Mohsen was unable to travel to Columbus on account of having had cataract surgery a few days earlier, but she uploaded her slides to the presentation management system and I, Cherrill Spencer, chair of the session, presented them for her.

There are 18 countries in the so-called Middle East and Mohsen presented data and facts on women physicists in Egypt, Tunisia and Morocco. She presented information about Egypt first. It has a population of 91 million (2016 numbers) of which 51% are males and 49% are females. The share of women in the labor force in 2015 was 22.5% (by comparison Spencer mentioned women’s share in the USA workforce is 47%). The percentage of females enrolled in higher education in 2014/5 was 47.7%. There are 20 public universities with about 2 million students and she presented data on four of them: Alexandria (established in 1942), Ain Shams (1960), Sohag (1975) and Kafr El Sheikh (2009). At Ain Shams there were 5073 bachelors students enrolled in science in 2015/6, of which 64% were women, in computer science, 2318 students of which 36% were women and in engineering, 9858 students of which 27%

were women. The percentages of women enrolled in languages, arts, commerce, pharmacy and medicine were all over 50% and law was 44%. Some of these percentages exceed the same numbers in the USA. The percentages of female students pursuing a bachelor's degree in physics in 2015-2016 were 57% (Ain Shams), 37% (Alexandria), 49% (Sohag) and 71% (Kafr El Sheikh). The actual numbers are small, e.g. at Sohag : 69 men and 67 women, nevertheless, these percentages far exceed the USA figure of 19.5% of B.Sc in Physics earned by women in 2016. The female percentages remain similarly high for master's degrees earned in physics at three of the universities over the 3 past academic years. Again the actual numbers are small, e.g. at Ain Shams in 2015-2016 12 males and 8 females earned master's degrees in physics. The data can be seen in detail in Mohsen's slides at <https://absuploads.aps.org/presentation.cfm?pid=14358>. During the same 3 years the female representation in doctoral physics degrees continued to be balanced with the males, aggregating 3 universities over 3 years: 25 men and 22 women got Ph.Ds in physics. (For comparison Spencer mentioned that in the USA 20% of physics Ph.Ds were earned by women in ~2016.) The data for female representation at various staff/faculty levels starts off well at the teaching assistant level, with ~50% at the 4 universities, but then it drops (using Ain Shams data) to 41% (lecturer), 26% (associate professor) and 21% (full professor). This falling off is the same effect as reported by the other two speakers in many other countries in the world (and the USA). Mohsen commented on this striking gender imbalance at the full professor level thus: it emphasizes the challenges faced by women – the need to reconcile work and family responsibilities; in general the poor availability of research funds with the women not getting their fair share; the low income of scientists; the cultural considerations in Egyptian society, for example, men do not accept work positions that are under the leadership of a woman and there is a well-established idea that women must choose between being a woman and mother or being a successful physicist.

Labor laws have been developed to help women in the workforce, e.g.

- Article 91: A working woman who has spent ten months in the service of the employer shall have the right to take a three month paid vacation upon delivering. Maternity Leave: Women are entitled a maternity leave up to three times during their period of service.
- The working woman who breastfeeds has the right to two breaks of not less than half an hour and has the right to combine these two periods during the period of 24 months following the date of the situation.
- Kindergarten: The employer must establish a nursery if there are 100 workers or more in one place of work. The conditions of the nursery are determined by a decision of the competent minister (article 94).

But these laws are not strictly followed, especially the one concerning nurseries at workplaces, so they have not helped (yet) women physicists in Egypt.

Tunisia's population is 11.5 million, of which 50.5% are female and 25.6% of the workforce are women. The data on Tunisian women physicists came from the Carthage University in Tunis. Again, surprising percentages, compared to USA data: 43% of students studying for their 1st degree in physics are women, this drops to 31% of the Ph.D students. All the other fields of science have over 50% women Ph.D students. But when one looks at the female Grade A staff their percentage representations are all significantly less than the Ph.D percentages. These reduced percentages are reflective of the country's struggles with unemployment: 19% of male graduates are unemployed and 41% of female graduates are without a job.

Morocco's population is 34 million of which 51% are female and 30% of the workforce are female. The data about women scientists



Five winners of the Elsevier Foundation Awards for Women Scientists in the Developing World, 2015: left to right: Rabia Sa'ïd of Bayero University, Kano, Nigeria, Dr Mojisola Usikalu of Covenant University, Ota, Nigeria, Dr Nashwa Eassa, Sudan, Dr Mojisola Adeniyi of the University of Ibadan , Nigeria, Dang Thi Oanh, Vietnam

in Morocco came from Hassan II Casablanca University. In Morocco, the female population in science and physics has been growing in the last decade. However, the research population is dominated by men and the percentage of women researchers in higher education is declining. Looking at various decision-making positions in all the sciences there are very small percentages of women in those positions, e.g. 10% as head of laboratory and 11% as research project leader. Some universities in Egypt, Tunisia and Morocco are becoming aware of these inequalities and are getting involved in gender projects and programs such as the SHEMERA and TARGET projects. The SHEMERA project aims to support Euro-Mediterranean cooperation in a joint effort to strengthen the role of women in science and indeed in all spheres of life, more information can be found at www.shemera.eu. The TARGET project promotes gender equality in particular by supporting structural change in the organization of research institutions and in the content and design of research activities, more information can be found at https://cordis.europa.eu/project/rcn/210054_en.html.

Mohsen's conclusions and recommendations are:

Women in general are an untapped resource in the Middle East; although the percentages of female physicists in the Middle East continues to increase at the undergraduate and postgraduate levels, as well as in the early stages of academic careers, the gender imbalance at the full professor and decision making positions levels is striking.

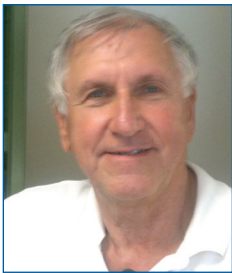
It is recommended to:

- Identify and implement ways to aid women in balancing their career and family life, such as through strict application of the mentioned labor laws.
- Eliminate gender stereotyping in schools, which implies that physics is not a suitable subject for girls.
- Present more female role models in physics to encourage girls into physics because studying physics is for a powerful way to develop critical thinking and analytical ability.

Spencer notes that these recommendations, written for the Middle East, are applicable to all countries because none have achieved true gender parity at all levels of a physics career.

Report on the FIP's Activities and Executive Committee Meeting 2018

Jerry Peterson, Chair of FIP 2018



During the April 2018 APS meeting in Columbus OH, we also held our annual meeting of the FIP Executive Committee (ExComm). For those of you who are not familiar with FIP operations, this body is responsible for the overall well-being and detailed operations of our Forum. Members include the five elected officers, the FIP Councilor (a member of the APS council), the Editor of the FIP Newsletter, and six members-at-large. These members of the ExComm were all elected by the FIP members.

We had 9 of the 13 ExComm members present in person participating to the meeting.

Our first step was to congratulate the new FIP officers:

- Chair-elect for 2018, Luisa Cifarelli, University of Bologna. Luisa will chair the FIP Program Committee in 2019, preparing for invited talks in 2020.
- Councilor (our representative to the overall APS Council), Emanuela Barzi, Ohio State University and Fermilab
- Members at-Large: Dmitri Denisov, Fermilab and Abhishkek Kumar, University of Maryland and NIST

Our FIP operates through several committees for our yearly tasks. For 2018, preparing for 2019, our committees are:

- **Program Committee**, chair Elena Aprile (age@astro.columbia.edu) This group is responsible for three sessions of five speakers each for the APS meeting in Boston March 4-8, 2019, and for three sessions of three speakers each for the April 13-16, 2019 meeting in Denver.
- **Nominating Committee**, chaired by Cherrill Spencer, FIP Past Chair, to prepare the slate of candidates for the 2018 FIP elec-

tion of officers, who will begin their terms January 1, 2019. This newsletter will be read too late to ask for nominations, but please begin to think about candidates for next time. Please contact the 2019 chair-in-waiting, Jerry.Peterson@colorado.edu, with self-nominations or the names of those who should be officers. It is not too early to begin thinking of the future.

- **Wheatley Award Committee**. FIP is charged with the selection for this award every two years (APS.org/programs/honors/prizes/wheatley.cfm), with the deadline being June 1, 2018. Jerry Peterson is the chair of this committee. The awardee will give an invited talk at either the March or April general APS meeting in 2019.
- **Fellowship Committee**. FIP is allowed five nominations from our membership for APS Fellowship. We are allotted one Fellowship nomination per 500 Forum members, so get your colleagues to join our Forum! There is no longer any extra cost. The APS standards for Fellowship are found at APS.org/programs/honors/fellowships/nominations.cfm, largely based on the nominee's impact on physics. In addition, the FIP standard for our nomination includes significant impacts on the international side of physics, demonstrated also by at least one year of membership in FIP. Jerry Peterson is the chair of this committee.

For the 2017, the new APS Fellows selected from FIP nominations, and awarded at the APS meetings, are:

Ahmed Ali/ Deutsches Elektronen-Synchrotron DESY

Sushanta Mitra/ York University - Ontario

Chilakamarri Rangacharyulu / University of Saskatchewan, Saskatoon, Canada

Surjalal Sharma/ University of Maryland

Bernardo Spagnolo/ University of Palermo

Shining Zhu/ Nanjing University

Sushanta Mitra and Chilakamarri Rangacharyulu were both receives certificate and the pin from Jerry Peterson and the APS CEO, Kate Kirby during FIP executive committee meeting (see photo).

Our Forum was responsible for the creation of the International Research Travel Award Program (IRTAP), which provides up to \$2000 for travel to visit an international collaborator, either way between a developing and a developed nation. Our ExComm is part of the review process to consider IRTAP proposals. See the details at <https://www.aps.org/programs/international/programs/travel-grants.cfm>

This program is running out of funds, which are currently provided year-by-year from other APS units, enabling their members to benefit from the travel support. Efforts are underway to make this a sustainable program, not relying on begging. We heard that the first round of the 2018 IRTAP had 36 proposals, reviewed by 12 reviewers from 8 units of the APS, with 10 winners, each of \$2000 for travel support. The second round now has 30 proposals.



New FIP Fellow Chilakamarri Rangacharyulu receives certificate and the pin from Jerry Peterson and the APS CEO, Kate Kirby (during FIP executive committee meeting, 15 April 2018)

Distinguished Student Program awards provide travel support for overseas students to attend APS meetings, where they present a talk or a poster. In 2018 we supported seven such students for March and four for April, as selected from the 2017 DSP applications; details on that past competition are found at aps.org/units/fip/awards/student-seminar.cfm

Surajit Sen and Jason Gardner have led this effort. Jason's term on the ExComm has ended in mid 2018, and Surajit's term is ending after 2018. This program will need another champion. In April, our Executive Committee approved \$5000 to support this program. We also decided to ask the APS for a more secure basis of funding for this program.

The ExComm was asked by the APS to amend our FIP bylaws to accord with those of the APS. The resulting amended Bylaws will be voted upon by the FIP membership as part of our fall 2018 election, if all goes well.



New FIP Fellow A. Surjalal Sharma receives certificate and the pin from Jerry Peterson and the APS CEO, Kate Kirby (during FIP executive committee meeting, 15 April 2018)



Toyoko Orimoto, Sheakha Aldaihan (DS winner Student), Jason Gardner, Riccardo Barbieri (DS winner student), Cherrill Spencer at the April Meeting 2018

Involving Physicists in Human Rights

Shelly Lesher, University of Wisconsin LaCrosse



At the APS April meeting in Columbus, Ohio, the Andrei Sakharov Prize was awarded to two individuals who embody the values of the man after whom the prize is named. Ravi Kuchimanchi used his physics knowledge to help those in need with the Association for India's Development (AID). Narges Mohammadi sacrificed her scientific career and liberty speaking up for the rights of others in Iran.

In addition to recognizing scientists who uphold human rights with the Sakharov prize, the APS has a standing committee to monitor human rights concerns for scientists throughout the world, the Committee on International Freedom of Scientists (CIFS). The Sakharov Prize session was sponsored jointly by the Forums on International Physics (FIP) and Early Career Scientists (FECS). I spoke about current human rights cases and presented physicists a way to involve themselves in these concerns.

There are many ways you can become involved in human rights activities. The first thing is to *stay informed*. There are a few organizations dedicated to helping academics from all fields, such as Scholars at Risk, and several that focus on scientists, such as APS-CIFS, the AAAS Science & Human Rights Coalition, and End National Security Scapegoating. They are all good sources of information, in addition to your favorite daily news source. If interested in a more in-depth discussion about the intersection between science and world affairs attend a Pugwash Conference.

You can *educate others* about human rights activities. This can be as simple as discussing these issues with colleagues or friends. If you are involved in teaching, incorporate these issues into your classes. This can be accomplished in multiple ways. Teach science through the lens of human rights by taking human rights problems that are of concern to your students and teaching them ways in which science can help to solve those problems. When discussing Albert Einstein

in Introductory Physics, mention his Nobel Prize, but also his views on peace, nuclear disarmament, and civil rights. Einstein was not only a world-renowned physicist but a great defender of human rights. Students will begin to see scientists in multiple societal roles and, one hopes, themselves as well. If you are ambitious, develop a course around these issues. I teach “Navigating Global Nuclear Issues,” which looks at the development of nuclear weapons and the impact they have had on the countries and people of the world. Tap into university resources and invite a science ethics seminar speaker or add a peace and human rights seminar to your physics REU program.

Finally, *take action*. CIFS need your help. Report any human rights violations, in any part of the world, via email on our website. In addition, CIFS relies on a network of discrete contacts to gather and verify information. Please consider signing up for our network of scientists noting any physics specialty or foreign language proficiency. Even more specialized is the AAAS on-call scientists program, a global network of scientists who volunteer as technical experts for NGOs, UN agencies, and human rights organizations. Skills of particular interest are data analysis and general scientific literacy. Approach your institution to host a Scholar at Risk. These threatened scholars seek temporary placement to advance their academic careers until they can return to their home country, [1] or permanently re-establish themselves in a new location

Surveying the history of science and human rights, physicists have always been involved in activism and the call for peace. As a physicist, you do not have to choose between science and human rights. Be involved in both, as much as you can.

Shelly R. Lesher is an Associate Professor of Physics at University of Wisconsin – La Crosse specializing in Nuclear Physics and the current Chair of CIFS.

[1] Toni Feder, *Physics Today* **71**, 24 (2018)



Shelly Lesher (left) and Cherrill Spencer (right) during the FIP/FECS Sakharov Prize session at the April Meeting 2018

FIP Sessions at the APS March and April 2018 Meetings

Jerry Peterson, Chair of FIP 2018

Our Forum was allotted 3 sessions at each of the two 2018 APS meetings, which we parlayed into 3.5 sessions for March in Los Angeles, and four for April in Columbus. Most sessions were chaired by the member of the FIP Program Committee who suggested the theme and invited the speakers. Maria Longobardi, FIP Newsletter Editor and chair of the FECS, created special reprints of our Newsletter which were used to advertise our sessions for March and April meetings. We also passed around forms to sign up for FIP membership, with very good responses at both meetings.

Welcome to our new FIP members!

The March meeting, as usual, emphasized broad areas of condensed matter physics, and set a new meeting record with 11,263 registered attendees, and much going on.

FIP sessions and titles were:

Physics Teaching in Gateway Classes: Global Perspective – Session H16

Chair - Surajit Sen, Member at large of FIP

This session presented experiments in the education of physicists, across a wide range of teaching methods and scales. One speaker was unable to attend. The final talk by a noted psychiatrist may even be a start on a unified theory of such education. “Teaching Introductory Physics Courses to Freshmen and Sophomores at Addis Ababa University”

- “International Student Experiences in Introductory Physics MOOCs”
- “Deriving Kepler’s Laws as Kepler Did—From (simulated) Noisy Data”
- “Awareness and Optimizing the ‘Yes Brain’ During Adolescent Neural Remodeling: A Teaching Opportunity”

Major Physics Organizations and their Role in the Future of Physics – Session L16

Chair - R. J. (Jerry) Peterson, Chair of FIP

This session was a summit of leaderships of major international physics organizations. The speakers agreed on the importance of international collaborations, in scientific and other arenas.

- “Physics and the Clinton Whitehouse Office of Science and Technology Policy”
- “The APS Task Force on Expanding International Engagement”
- “Light Sources for Africa, the Americas and Middle East Project (LAAMP): An IUPAP and IUCr-funded Project”
- “ICTP: A Successful Model of International Scientific Collaboration”
- “EPS: Promoting Scientific Cooperation in Europe in a Global Context”

We also hosted an invited luncheon for these five speakers, plus our own Noemi Mirkin (FIP Secretary/Treasurer), Roger Falcone (2018 APS President), and Joe Niemela from the ICTP. These five speakers and others at the luncheon amplified their remarks, with remarkable agreement on where and how international physics projects will be proceeding.

Condensed Matter Experiments on the International Space Station (Co-sponsored by the FECS) – Session Y32

Chair—Maria Longobardi, FIP Newsletter Editor and Chair of the FECS

In this session, the speakers presented recent experiments performed on the ISS, matching the meeting theme and (by definition) broadly international.

- “Kinetic Bottlenecks of Colloidal Self-Assembly”
- “Smectic Bubbles in Space: Fluid Physics in Two Dimensions”
- “Complex Plasma Research under Microgravity Conditions on the ISS”
- “Coolest Spot in the Universe: Facility for Ultracold Atom Experiments aboard the ISS”
- “Colloid Physics Experiments on the ISS”.

We also shared a session **Materials and Fuels for the New Energy Economy**, with the Group on Energy Research and Applications (GERA), with FIP providing a speaker on the nuclear reactor production of hydrogen, as feed stock for many processes and as input for new fuel cell technologies. Other speakers covered new battery, fuel cell and photovoltaic materials.



Ravi Kuchimanchi gives his Sakharov Prize winner speech during session



Nayereh Tohidi gives speech written by her friend Narges Mohammadi (while in jail in Tehran) at the Sakharov Prize winner session

At the March meeting we hosted a crowded reception, co-sponsored with the FECS and with the support from several international associations of physicists working in the US. These associations were the International Association of Chinese Physicists and Astronomers, the Association of Korean Physicists in America, the Iranian-American Physicists Network Group and the Turkish-American physicists, with a contribution from a Turkish firm VAKSIS. Also helping to support this reception were the APS Office of International Affairs and the Forum on Early Career Scientists. All of FIP thanks these supporters of our mission.

At the April meeting in Columbus OH, FIP arranged four sessions, each of three speakers.

Opportunities in Global Nuclear Science Industries – Session B06

Chair—Jerry Peterson, Chair of FIP

This April meeting is attended by many young people studying nuclear and particle physicists, so this session was designed to show the many job opportunities available, such as in the FIP session “Applications of Accelerators in Nuclear Science”

- “Radiation Testing Electronics with Heavy Ions—The Best Way to Hit a Target Moving Ever Exponentially Faster”

“Advancements in the Global Use of Isotopes for Medicine, Industry and Environmental Science”

Other FIP sessions are reported in the following.

Physics Experiments in Antarctica, What They Tell Us about the South Pole and the Changing Climate – Session U03

Chair- Noemi Mirkin, Secretary/ Treasurer of FIP

This session showed that simple physics concepts, applied to complex problems, can yield good understanding of nature, especially changes that will influence the future of us all.

- “The Microphysics of Antarctic Clouds: What We Know and What We’re Trying to Discover”
- “Observing Antarctic Ice-sheet Conditions Using Ice Penetrating Radar”
- “Breaking the Ice: An Exploration of Material Behavior, Boundary Conditions, and (Ice) Failure in Antarctica”

Progress and Challenges for Women Physicists in Africa, Asia and the Middle East – Session X06

Chair- Cherril Spencer- Past Chair of FIP

This session demonstrated (again) that grit and determination can create successes in tough environments, such as faced by women trying to do physics in some regions of the world.

- “Women in Physics in Nigeria and other Sub-Saharan African Countries; Progress and Challenges”, Ibiyinka Fuwape/Michael and Cecilia Ibru University/ Nigeria. Winner of the APS Marshak Lectureship.
- “Women Physicists in India and Other Asian Countries”, Rohini Godbole/Centre for High Energy Physics, Indian Inst. of Science.
- “The Status of Women Physicists in Egypt and the Middle East”, Mona Mohamed abd Latif Mohsen/Ain Shams U/Egypt, winner of the APS Beller lectureship. Professor Mohsen was unable to attend and speak, so her text was read by Cherrill Spencer, 2018 Past chair of FIP.

Sakharov Prize Session (Co-sponsored by the FECS) - Session E17

Substitute Chair- Cherrill Spencer, Past Chair of FIP

- Ravi Kuchimanchi, Sakharov Prize winner---“Parity in our world and in physics”
- Shelly Leshner, University of Wisconsin LaCrosse---“The impact of science on human rights in the 21st century”
- Nayereh Tohidi (family friend of Sakharov Prize winner Narges Mohammadi)—Professor of Gender and Women’s Studies, Director of Middle Eastern and Islamic Studies, Cal State U, Northridge. Professor Tohidi read the acceptance speech of winner Mohammadi, which she had written from her jail cell in Tehran: “Prisoners of Conscience in Iran”. This was a deeply moving talk. The full text can be read here: <https://www.iran-humanrights.org/2018/04/imprisoned-rights-defender-narges-mohammadi-gives-message-of-hope-and-strength-in-accepting-2018-andrei-sakharov-prize/>

For 2019, FIP anticipates again three sessions of five speakers each for the March meeting in Boston, and three sessions of three speakers each for April in Denver. Our FIP Program Committee, chaired by Elena Aprile, is awaiting your suggestions for themes and speakers for these meetings.

Several of the speakers at your FIP invited sessions for March and April 2018 have posted their slide shows on the APS web site. Go to aps.org, select ‘Meetings’, then select ‘View Meeting Presentations’.

2018 Executive Committee of the Forum on International Physics



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University of Colorado - Boulder



Newsletter Editor
Maria Longobardi
University of Geneva
Switzerland



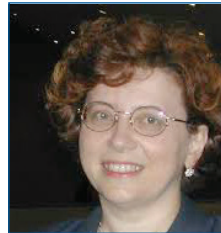
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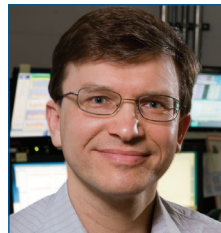
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State University of New York - Buffalo