

PHYSICS OUTREACH & ENGAGEMENT

Letter from the Chair

Dear FOEP Members,

Now more than ever it is vital that we redouble our commitment towards outreach and engaging the public. In an era where distrust of science seems to be growing, effective communication and illustrating why we are so excited about our science will be crucial. Luckily we have many terrific examples of such outreach to draw on both within the APS community and from the broader public itself. With these ideas in mind I would like to draw your attention to a number of exciting events, from the recent past and the near future, that FOEP has organized.

The **invited Session at the APS April Meeting** went well. We had a terrific line up of speakers at our April Meeting including David Kaplan (JHU), Rachel Wolf (UPenn), and Marjorie Bardeen (Fermilab). For more about the April Meeting events **please see page 14**.

FOEP is sponsoring the **APS March Meeting workshop: Finding your Scientific Voice**. Two workshops will be given on Sunday March 12. **Please see page 15** for more about this workshop.

FOEP Invited Session at the APS March Meeting: From Physics Girl to the Physics Bus, Creating an Effective Voice for Physics in a Diverse Society. Our **Please see page 16** for more information about what FOEP has planned.

The Physics Bus will be in New Orleans for March Meeting! See **page 16** for more information about their weeklong outreach activities.

Continued on page 2

JOIN US

To join FOEP at no cost prior to renewing your APS membership, send an email to membership@aps.org with your request to add FOEP to your membership. Please note that if you currently belong to two or more forums, FOEP will be added at no charge for the remainder of your membership term. On your next membership renewal notice, you will see a Forum subtotal that will include \$10 for every Forum membership over two.

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*A publication of The Forum on Outreach and Engaging the Public - FOEP -
A forum of the American Physical Society*

Welcome to our new members

I would like to extend a warm welcome to our new FOEP Members from the entire Executive Committee. We are looking forward to hearing from you about the kind of events you would like to see more of at our meetings and events.

Give a non-technical talk in addition to your technical talk at APS meetings

I would like to remind the community and the FOEP members in particular that they can give a non-technical talk in addition to their technical science presentation at the APS meetings. I encourage you to do so since we need to have a thoughtful and creative exchange of ideas moving forward.

Thanks to the FOEP executive committee for working tirelessly on our behalf

Finally, I would like to take this opportunity to thank the FOEP Executive Committee for their efforts and commitment to improving FOEP and APS more broadly. It has been a pleasure serving with all of them as we have set out to represent you not only through the meeting programs but also through engagement with APS.

The current FOEP Executive Committee members are:

Past Chair: Yvan Bruynseraede

Chair: Itai Cohen

Chair-Elect: Larry Gladney

Vice Chair: Don Lincoln

Secretary/Treasurer: E. Dan Dahlberg

Members at Large: Alice Bean, Amber Stuver, Heide Doss, Rachel Henderson

APS Staff member: Rebecca Thompson

Assigned Council Representative: Gay Stewart

Editor of Newsletter: Heide Doss

Itai Cohen, Chair



Letter from
the Chair,
continued

continued
the Chair
continued

Forum on Outreach and Engaging the Public

FOEP's goal is to increase the public's awareness of physics by providing a forum within APS for the large number of physicists currently involved in a diverse array of outreach and public engagement activities. FOEP fosters the development and dissemination of outreach activities such as blogging, multimedia, video, pop culture, popularizations, press relations, politics, "amateur" and distributed science, science cafes, and public shows and lectures. The Forum organizes and sponsors sessions at the March and April APS meetings and will issue a semiannual newsletter.

Spotlights on Outreach and Engaging the Public

FOEP's 2016

Dwight Nicholson Awards for Outreach

Questions and Answers with FOEP's two 2016 Nicholson awardees, John M. Dudley and Joseph J. Niemela. Answers are edited for clarity as needed.

John M. Dudley, FEMTO-ST Institute and the University of Franche-Comté & Joseph J. Niemela, International Center for Theoretical Physics shared the Dwight Nicholson Award for Outreach for:

"For outstanding leadership of the International Year of Light (2015) and for optical science and engineering outreach on a global scale."

**John M. Dudley,
FEMTO-ST Institute**

Q. How did you get involved in outreach?

In my case, it goes right back to when I was a student in New Zealand and I ran the student Physics Society. One of the things we did was to organise the departmental Open Days, and I suppose these showed me both the need and the potential for public science communication. In a small country like New Zealand it has always been essential to justify investment in science and doing so by reaching the public is of course a very effective means. After moving to Europe I became involved in the European Physical Society, which allowed me to develop this further.

Q. What do you find most exciting about outreach? Most rewarding? Most difficult?

When things go right, outreach is its own reward - seeing young people being inspired, or watching as the lights go on in students faces as they begin to understand some new concept is something one never tires of. The difficulty - which I faced in the past but which is less of a problem now - is of course convincing skeptical colleagues of its importance and fighting against the elitism that unfortunately still seems to be present among many in physics. However, attitudes are changing albeit slowly, and one of the nicest things about the Year of Light was seeing naysayer colleagues become some of the Year's strongest supporters. And of course there is the difficulty in combining



John M. Dudley
FEMTO-ST Institute

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"I am lucky in France to be well-supported by my university and the CNRS, as well as colleagues in my department and research group otherwise I would never be able to get involved in outreach."

outreach with regular academic duties and grant writing and research and travel etc etc I am lucky in France to be well-supported by my university and the CNRS, as well as colleagues in my department and research group otherwise I would never be able to get involved in outreach.

Q. How did you happen to be put in charge of organizing the UNESCO 2015 Year of Light?

The story of the Year of Light goes back to 2009 when I “volunteered” to represent the European Physical Society at an inter-society meeting in Baltimore to discuss international initiatives promoting optics. At the time, OSA, SPIE, IEEE and APS had joined together to promote Laserfest in 2010, but I had the feeling that there was a missed opportunity in not aiming higher for the status of an International Year (I knew of the International Year of Physics in 2005 and Astronomy in 2009). I still haven’t learned to be quiet and I said as much in the meeting, and was then “encouraged” to try to find out how to organise one (there is no manual!) which involved lots of missteps. But we decided to push ahead and in 2011 we held the “Passion for Light” launch event in Italy where Joe attended represented UNESCO-ICTP and their optics program, and it was as a result of this meeting that we really were able to push ahead. We assembled a Steering Committee with myself as Chair and Joe as Global Coordinator, and together we followed the Year through its various steps at UNESCO and the UN General Assembly to get official proclamation, to the practical implementation and the setting up of a Secretariat team in Joe’s office at ICTP.

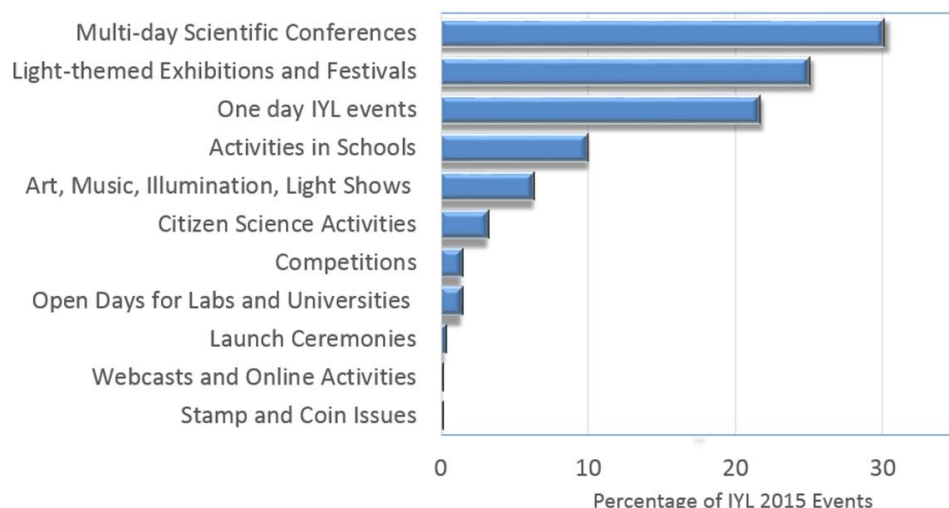
Q. How did such a global endeavor impact you?

It’s a little obvious I suppose, but I was very struck by the many ways that students and teachers from developing countries are so passionate to learn, notwithstanding given their limited opportunities. I was also very impressed to see the new category of “social entrepreneur” developing to spread the results of science and technology to developing countries and other communities in need.

On another level, I became aware of the fact that in today’s climate, outreach is no longer optional, but is a very necessary responsibility of all scientists. And this refers not only towards the public, but also using many of the same strategies to explain what we are doing to decision-makers and politicians. I learned a lot about speaking to politicians during 2015, and it is not such an insurmountable barrier as one might think.

Q. Were there any measures made on the impact of the Year of Light? If so, what were those measures and what can be concluded by them?

I suspect we could have a day long conversation on measuring outreach impact. Joe and I was inundated with requests for metrics, targets and KPIs (Key Performance Indicators) from 2014 onwards, but I knew that these would be completely meaningless in the context of an International Year because they are completely irrelevant to the majority of the countries of the world. One would lose an enormous amount of time trying to explain what these were all about in smaller and developing countries where it was already a huge challenge to even organise one or two events. Making event organisation bureaucratic would have turned people off. Moreover, how on Earth does one quantify the potential inspiration or positive feeling towards science that is felt by a young child ... So rather than trying to invent artificial targets, we decided to simply implement a very efficient system of “global tracking” to keep track of the numbers that did mean something like attendance, fundraising, media hits etc. These numbers are summarised quite well in the Executive Summary (found here: <http://unesdoc.unesco.org/images/0024/002460/246088e.pdf>).



The steering committee and advisory board members represented 25 countries and combined were comprised 35% of women.

There were over 13,168 events over 147 countries, on all continents including Antarctica!

The audiences ranged from preschoolers to politicians

And eighteen countries issued commemorative stamps or coins.

Interactive breakdown of IYL events by category. Credit: J. Dudley
<http://unesdoc.unesco.org/images/0024/002460/246088e.pdf>

That said, we received a million euros to run a large EU-funded project during the International Year of Light, and here we couldn't avoid KPIs and targets. On the other hand, it was much easier to envisage meaningful numbers and categories within the EU, and we developed a questionnaire that we used both during the event as well as afterwards (via an email request to the mailing lists).

Q. What advice would you give to others trying to outreach on a large or small scale?

In my view, it is essential not to "become a manager" but to remain actively involved in the outreach itself through meeting students and talking and engaging personally with the public. There was a huge amount of frustration and hard work with the international nature of the planning, and personally seeing the positive impact of what we were doing was essential to remain focused.

Q. Is there any part of your outreach experience you just think worth telling others about in this spotlight feature?

The International Year of Light would not have worked without scientists freely donating their time and effort. Interestingly, there were many professionals in the organising team who did not believe that there would be such volunteer enthusiasm, but having seen this myself over many years, I had no doubt that the scientific community would step up. But it was essential to be able to bring people together under a unifying banner, and this is something I would stress if anyone wanted to do something similar in the future. It can be hard to work with large international organisations, but the mandate that they give to a project allows one to do things that would not otherwise be possible.

Bureaucracy needs to be minimised to avoid stifling enthusiasm. Of course, with such a large event with many diverse and dispersed activities globally it was important to have a means of following what was going on, and oversight was needed to check events to ensure they were respecting the goals of the Year and in particular to exclude any pseudoscience.

I also noticed something that delighted and concerned me in equal measure. Of the scientists organizing activities during 2015 there were about the same number of men and women, yet data from UNESCO shows that women only make up 28% of science researchers worldwide. This suggests that perhaps a disproportionate number of women were volunteering to work on outreach during the International Year. Why this is, I am unsure, and as wonderful as it is, I wonder how outreach activities are impacting early careers in a scientific community where outreach is still not fully supported. Including outreach contributions into evaluations of career performance and promotion is something that I think is essential.

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**Joseph J. Niemela,
International Center for Theoretical Physics**

Q. How did you get involved in outreach?

Well, if we go all the way back into prehistory, outreach for me had its tenuous beginnings at home as an undergraduate physics student trying to explain what I was doing (and why) to parents, grandparents and other curious relatives—the “taxpayers” helping to fund my education, including occasional laundry service and care packages of take-away meals. That is a particularly tough audience that won’t accept buzz words or mathematical descriptions (unless you perhaps grew up in a family of Ph.D.s and frankly, I am sure I failed miserably at least on the first few rounds. Later, as a postdoc, this became easier and I had the good fortune of being offered an opportunity to teach a university course for non-science majors-- from philosophy majors to student-athletes. This was not a popular course for the faculty, as I vaguely recall, and I had the strange feeling that they were drawing straws... something that I never quite understood because it was not only tremendously fun but also a type of honor; for me, it opened up the joys of communicating science to a wider group of people who were not intending to make a career out of physics but were anyway very curious about it. It was a new challenge that was met with many classroom demonstrations, a substantial amount of patience, and a lot of care in



Joseph J. Niemela
International Center for
Theoretical Physics

"Isolation leads to a type of academic in-breeding, which we know was not good for Europe's royalty, and neither is it good for science, which lives in open international air on a front which moves always forward. One important part of outreach in developing countries is simply showing up, providing a different perspective, if only temporarily, to young aspiring physicists, in addition to specific training."

wording. In the front row was a young woman who was blind, accompanied by her dog. That really forced me to improve the quality and accuracy of my oral delivery (not an easy task as those who know me can attest...) particularly since the demonstrations were largely visual. She maintained a position at the top of the class despite everything. Further back in the class was one of the student-athletes. Interestingly, the athletic department called me up one day to check on him, obviously worried (panicked I would say) about his progress in a physics course of any sort and offering to provide tutors and requesting that I work with them. I was very happy to reply that while all that was appreciated, I didn't see any need for extra help as he was there every day and was curious enough that we would occasionally discuss the subject of the day in more depth after class. So much for stereotypes....! Anyway, I learned a lot from this experience that would push me towards doing outreach later. I eagerly accepted other opportunities to engage with people I normally wouldn't have the chance to meet, from lunch talks at rotary clubs to plenary talks at medical conventions (really I did this...it was fantastic!). And all the while, I was going once a year to my daughter's school (from third grade through high school) with some liquid nitrogen, a bag of demonstrations, and a few jokes to make it all go smoothly. Fast forwarding, moving to a UNESCO organization (the Abdus Salam International Centre for Theoretical Physics in Trieste Italy) was like finding the holy grail of outreach; the Centre's founding Director, the late Nobel Laureate Abdus Salam at one time asked scientists there to try to find some appropriate balance between their own fundamental research and another, perhaps more applied, area of science that addressed more immediate societal needs in developing countries. For me personally that "other" area was optics and photonics, in which I quickly found a natural avenue for doing outreach on a global scale, from the introduction of inquiry-based learning methodologies for teaching optics in collaboration with the science sector at UNESCO headquarters, to providing opportunities for hands-on experience and experimental opportunities in optics and photonics (and other areas as well) for early career scientists in developing countries—always with a particular attention to young women students and scientists. Getting sufficient funding for science is a challenge everywhere, but certain countries also have become somewhat isolated due to sanctions, war, etc. Isolation leads to a type of academic in-breeding, which we know was not good for Europe's royalty, and neither is it good for science, which lives in open international air on a front which moves always forward. One important part of outreach in developing countries is simply showing up, providing a different perspective, if only temporarily, to young aspiring physicists in addition to specific training.



Post IYL inspired outreach at Quaid-i-Azam University. Credit Joe Niemela

Q. What do you find most exciting about outreach? Most rewarding? Most difficult?

For me the most difficult part of outreach is also part of what makes it exciting: getting out of your comfort zone, and trying to connect in some real way, to communicate excitement, understanding, and some sense of the place of physics and physicists in society to people from all walks of life and all ages. For IYL 2015, one difficulty was of course finding time to properly do the other jobs I was actually hired to do, as this was an entirely voluntary for everyone involved.

Q. How did you happen to be put in charge of organizing the UNESCO 2015 Year of Light?

Becoming engaged in the organization of the Year of Light occurred through a number of fortunate encounters, starting in Varenna, Italy in 2011 for the EPS conference “Passion for Light” at which the Year of Light initiative was publicly announced. The organizers had sent a message to ICTP that there were some spots available for students from developing countries, and given the lineup of speakers it was a great offer indeed. I volunteered to take a couple of young women Diploma students from Africa—well I wanted to see these talks too! I happened to mention this to the Director of Basic and Engineering Sciences in UNESCO headquarters and he was delighted, mainly because the Assistant Director General for Science had wanted to come for it but had a conflicting engagement, so I was asked if I would agree to represent her in the opening ceremony. Perfect! That was a great 5 minute opportunity to describe the teacher-training program in optics and photonics shared between ICTP and UNESCO headquarters (which would become one of the important global projects during IYL 2015), as well as the SESAME synchrotron project in Jordan, which at the time had an expected commissioning date of 2015, the same year as the proposed Year of Light. There I met two wonderful people, Luisa Cifarelli, then President of EPS and John Dudley, EPS President-elect. I remember being completely awed at John’s let’s-get-straight-to-work character—my hand was just cooling off from our introduction and we were already deep in discussions over details of the Year, how to get it through the UN system as well as what to do to get scientists in developing countries involved. If I were to think of some of the things I found personally rewarding in this outreach effort it was to work with outstanding professionals like John and Luisa and many many more.

Anyway, ICTP, with its long-standing advanced program in optics for early career participants from all over the developing world, in addition to its teacher-training programs in optics, made it a natural partner, especially for what one could loosely label “light for development.” ICTP also had the advantage of being completely neutral, and being the head of an office that took care of external activities at ICTP, with a professional staff that agreed to volunteer their time to help make IYL 2015 a success, made it an easier decision for the IYL Steering Committee to vote on placing the Global Secretariat there. About this point: we are mostly talking about scientists volunteering their time to outreach, but big successful projects require bringing more people on board as partners besides scientists, and the administrative staff in our Secretariat worked extremely hard, not even stopping for Christmas break prior to the January 2015 Opening of the Year. This was a particular characteristic of the Year of Light: partnerships with scientists, engineers, industry leaders, artists, theologians, designers, our fantastic secretarial staff, and many others the world over, all working together to make it a success.



Post IYL inspired outreach at Quaid-i-Azam University. Credit Joe Niemela.

Q. How did such a global endeavor impact you?

One of the most interesting and rewarding aspects of IYL was to work with people from different areas of society. I engaged heavily with the lighting industry for instance and also with the artistic communities (light-painting, sculpture, music). We were committed to raising awareness about light-based solutions to societal problems, and I began to realize that I was one of those whose awareness was being raised, for example in areas such as lighting design and human-centric lighting where I understood that awareness

raising was also associated with creating markets that enable better products to emerge for improving the quality of life of people everywhere, from off-grid villages to major metropolitan areas. The idea that philosophers and artists could play a part in what seemed at first to be a purely “scientific” year seemed strange initially, but it made a lot of sense as the year began to take off. Using the term “light” meant that each group felt like this was “their” Year and indeed it was. It was ours. And that was the magic of the Year of Light. It was an intrinsically inclusive year in a period when inclusion is fading away rapidly around the world. It was a wonderful opportunity to involve young people, from the many physics students who volunteered to help at the opening and closing ceremonies to the student chapters of major optics societies like SPIE and OSA around the globe doing their part to bridge the gap to even younger audiences. The fact that we could empower national or regional committees to act locally around the world meant that we could multiply our efforts with very little funding, noting that there was no funding coming from the United Nations for any of the activities. This had a silver lining as local committees found that they could leverage IYL 2015 to help them get funding from their own governments for local outreach events, which in turn allowed for relationship-building that would better enable them to engage in the future. One interesting note is that one of our musical collaborators, the Italian group Jalisce, winners of the San Remo Music Festival, worked this year with the Foreign Ministry and helped to make important introductions at a diplomatic level in central Asia, where we are wanting to get further involved in scientific outreach. You never know where good relationships can take you.

Q. Were there any measures made on the impact of the Year of Light? If so, what were those measures and what can be concluded by them? (Please note - I know from my personal experience the year of light was very impactful, but I am often asked this question about endeavors I am involved in and I have not done much to quantify my outreach efforts so I am curious.)

Impact is indeed a difficult quantity to measure. Most of this information is included in John’s material which involves estimating participation, financial contributions, website reads, media mentions, etc. We can only estimate of course, but the evidence points to huge numbers—a significant fraction of the world population- having contact with the Year in one way or another in many countries on all continents (including Antarctica!).

Q. What advice would you give to others trying to outreach on a large or small scale?

My advice is to just jump in. Besides the social responsibility, there are personal rewards (satisfaction comes almost immediately, transmitted from the eyes of those who are benefiting). It need not, of course, be on a global scale such as IYL 2015. Close to home is much easier and there is always an opportunity to help motivate and inspire others which comes back to benefit the scientific community sooner or later. As for global engagement, I would strongly encourage scientists to accept invitations to give talks in countries in the developing world. The experience is incomparable and those who do it keep



Post IYL inspired outreach at Quaid-i-Azam University. Credit Joe Niemela.

coming back, realizing they can make a huge difference in the lives of bright and talented young students and early career scientists who may not have many opportunities to travel outside their countries. In particular, I would especially encourage US scientists to consider lecturing in Pakistan and Iran—as scientists we can help keep the doors of communication open in spite of the political rhetoric and actions which tend toward isolation. Scientists as diplomats. It is an idea that has substantial merit. Helping to train their young people, sharing your perspectives on doing science-- on how to *be* a scientist-- makes you part of the solution to important problems in our world today.

Q. Is there any part of your outreach experience you just think worth telling others about in this spotlight feature?

There is one feature of the IYL follow-up that I would like to share. I have been going to Islamabad for a number of years now having always found a warm welcome there, from scientists and ordinary citizens I meet on the street. During IYL 2015 we organized several activities there, one being the teacher-training workshop in optics and photonics, held at the National Center for Physics (modeled after the Abdus Salam ICTP). Two facts were always in my mind—Malala’s extraordinary courage to promote education for girls and the many banners I saw posted on the main boulevards of Islamabad exhorting whoever was reading them to “let girls go to school.” I soon after talked to Becky Thompson at APS during a dinner at the IYL 2015 closing ceremony, a month or so later. She immediately said yes to my request for donation of special kits that could help keep kids interested in science. Soon after I arrived back in Trieste, a big box of light science kits arrived from APS, and together with the Photonics Explorer kits that were in my office we arranged a shipment to local colleagues in Islamabad and nearby Abbottabad. With these they started to arrange a series of one-day hands-on science workshops in optics for high school girls and young women undergraduates. Fantastic. Outreach that impacts hundreds of lives with only volunteer effort and donations of equipment. I attended the workshop at Quaid -i-Azam University and found 20 young women undergraduates who showed up on a university holiday, in spite of the fact that there was no credit associated with this hands-on workshop, and the fact that it was in July with an outside temperature above 40 degrees Celsius, and no air conditioning in the classroom. We had plenty of liquids to satisfy our thirst,



Post IYL inspired outreach at Quaid-i-Azam University.
Credit Joe Niemela.

but there was another thirst-- for learning-- that you rarely see anywhere. I think that it was one of the most inspiring moments of my career, to witness just how much they wanted this opportunity to get their hands on some equipment and do experiments. It is impossible to walk away from this without feeling a warm sense of accomplishment. Next stops are public schools in the remote areas northwest of Islamabad, which often do not have electricity. Always more challenges. But also more rewards.

H.M. Doss

Dwight Nicholson Medal for Outreach

The Forum on Outreach and Engaging the Public assumes responsibility for this prize. This important APS prize consists of the Nicholson Medal and a certificate that includes the citation for which the recipient has been recognized.

The prize shall be awarded to a physicist who either through public lectures and public media, teaching, research, or science related activities has

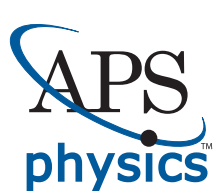
1. successfully stimulated the interest and involvement of the general public on the progress in physics, or
2. created special opportunities that inspire the scientific development of students or junior colleagues, or has developed programs for students at any level that facilitated positive career choices in physics, or
3. demonstrated a particularly giving and caring relationship as a mentor to students or colleagues, or has succeeded in motivating interest in physics through inspiring educational works.

Full details are at: <http://www.aps.org/programs/honors/awards/nicholson.cfm>

Nomination deadline: Friday, June 30, 2017

Contributed by: E. Dan Dahlberg

Know someone who would be deserving of the Nicholson award or worthy of being an APS Fellow? Don't wait!!! Start the nomination process now.



FOEP
**FORUM ON OUTREACH &
ENGAGING THE PUBLIC**



*Dwight
Nicholson
Medal for
Outreach*



2017 FOEP Nominations for APS Fellows



What

APS Fellowship constitutes recognition by one's professional peers of exceptional contributions to the physics enterprise. Only a small fraction of the APS members reach the level of fellows and therefore this is an important recognition.

Who

Only APS members who are members of FOEP can be nominated for fellowship through FOEP. The deadline for Fellowship nominations is usually in May. We strive to have a diverse group of nominees and encourage the nomination of members of all underrepresented groups.

Who

How

Nomination is done entirely on-line. Complete instructions for the nomination are available at: <http://www.aps.org/programs/honors/fellowships/nominations.cfm>.

How

The process consists of: providing the nominee's contact and professional information, uploading nomination letters documenting the accomplishments of the nominee and explain why he or she is deserving of recognition. Note that it is the responsibility of the nominators to provide a compact however complete nomination.

Evaluation

Nominations are evaluated by the FOEP nomination committee, reviewed by the full APS Fellowship Committee, and finally submitted for approval to the APS Council.

Subject

Outreach is a broad enterprise, spanning academia, industry and national laboratories, as well as freelance professionals such as writers, journalists and bloggers. Outreach activities are often overlooked and undervalued. Thus it is important to think about and propose people who have an exceptional track record in this area.

Why

Nominating someone for APS fellowship takes time; however, it is a great way to emphasize the importance of reaching out to and engaging with the public. At the personal level it is very satisfactory to get recognition of your peers.

Contributed by: Ivan K Schuller



Congratulations FOEP Fellows for 2016

Fellows for 2016:

Goldfarb, Steven [2016]

University of Michigan

Citation: For devising new techniques and creative methods to facilitate science communication and education on a global scale.

Mócsy, Ágnes [2016]

Pratt Institute

Citation: For innovative explorations of the intersection of science and the arts, for advocacy on behalf of fundamental science, and for promotion of underrepresented minorities working in science.

Thompson, Rebecca [2016]

American Physical Society

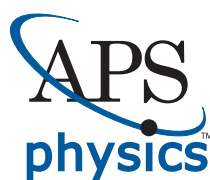
Citation: For development of innovative physics outreach, engagement, and informal education programs reaching millions of children and adults every year, and outstanding leadership in US and international science outreach communities.



FOEP Membership

Stop by the APS table at the March meeting to sign up for membership! Or sign up online.

To join FOEP at no cost prior to renewing your APS membership, send an email to membership@aps.org with your request to add FOEP to your membership. Please note that if you currently belong to two or more forums, FOEP will be added at no charge for the remainder of your membership term. On your next membership renewal notice, you will see a Forum subtotal that will include \$10 for every Forum membership over two.



FOEP

**FORUM ON OUTREACH &
ENGAGING THE PUBLIC**

FOEP at the April in January Meeting 2017



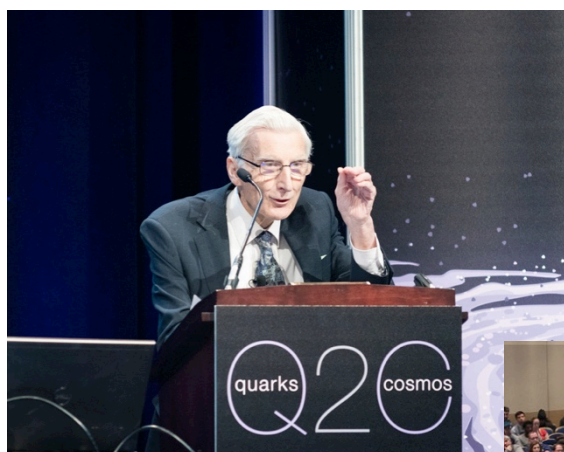
Invited Session at the APS April Meeting:

We had a terrific line up of speakers at our April Meeting including David Kaplan (JHU), Rachel Wolf (UPenn), and Marjorie Bardeen (Fermilab).

Contributed by: Itai Cohen

DC played host to the 2017 April Meeting held January 28th-31st. FOEP held successful contributed and invited sessions attracting many outreach enthusiasts. A highlight of the weekend was the Public Lecture given by Lord Martin Rees. The house was packed with over 1,000 people as Lord Rees discussed the history of the exploration and understanding of our universe and the future of this pursuit. Lord Rees is also this year's recipient of the Lilienfeld Prize for exceptional contributions to physics. If you are on Facebook you'd like to view a video of Lord Rees's talk, please

visit: <https://www.facebook.com/apsphysics/videos/10155166016167952/>



Contributed by: R. Thompson



Double your exposure by giving an outreach talk in addition to your science talk!

The Forum for Outreach and Engaging the Public will have contributed talk sessions at the March (section 25.6) and April (section R5) meetings. *Importantly, these talks do not count against you, so you can still submit a scientific presentation.* We look forward to hearing about your work.

FOEP at the March Meeting



MARCH 13 - 17, 2017
NEW ORLEANS, LOUISIANA

FOEP sponsored workshops at the APS March Meeting: Finding your scientific voice.



Finding Your Scientific Voice Workshop to be held at the APS March meeting. Join Melanie Dreyer Lude and Itai Cohen as they guide you through a series of exercises for improving your 10 minute talks.

Sunday, March 12 Two Sessions: 9:00 a.m. - 12:00 p.m. and 1:30 p.m. - 4:30 p.m.

Who Should Attend?

This workshop is restricted to APS graduate students and postdocs.

Overview

You've spent years designing, carrying out, and wrapping up your research. Now it's time to communicate your results to your peers and the broader community!

The [Forum for Outreach and Engaging the Public \(FOEP\)](#) will host workshops on improving communication skills of students and postdocs. Each 3 hour workshop will focus on how to improve the 10 minute talks for the meeting as well as give participants instruction on how to communicate with the lay public about their work.

A similar workshop was delivered at the APS DFD meeting in Portland Oregon and was received very well by the students:

"...a great workshop! ... I can definitely say that it was more than worth it!"

"The improvisation exercises were great as well as the concrete feedback to the talks."

Julia

"it was good to have someone expert in our field and also a good coach."

Allyson

FOEP at the March Meeting



MARCH 13 - 17, 2017
NEW ORLEANS, LOUISIANA

FOEP Invited Session at the APS March Meeting: From Physics Girl to the Physics Bus, Creating an Effective Voice for Physics in a Diverse Society

(Monday 2:30-5:30pm Room 286)

We have a great line up for this session including **Physics Girl**, the folks from the **Physics Bus**, Charlie Falco who will be talking about **The Art of the Motorcycle and the History of Art**, as well as Amber Stuver from **LIGO**, and Melanie Dreyer-Lude who will discuss **Theater Techniques for Physicists**.



Physics Girl Dianna Cowern will explain the challenges she had to overcome in creating the Physics Girl YouTube Channel

The Physics Bus will be in New Orleans for March Meeting!

The Ithaca Physics Bus is about doing science for fun. It is a mobile exhibition of upcycled appliances--reimagined by kids--that showcase unfamiliar physics phenomena. The mission of the physics bus is to awaken interest and creativity in physics for all ages and walks of life.

The Bus is coming down to New Orleans for the APS March meeting 2017 and will be making stops in schools and community events throughout the week. Stay tune for an event schedule. Make sure to check it out while it is in town!



Check out the physics bus during the APS Monday Night Happy Hour in the Convention Center Exhibition Hall

JOIN US FOR FOR THE FOEP HAPPY HOUR!

Tuesday March 14, 2017 from 6-8 at Gordon Biersch 200 Poydras St, New Orleans, LA 70130

APS March Meeting 2017 Session Q19: A Staged Reading of the Play: Moving Bodies
Wed March 15, 2017 8:00PM-10:00PM Room: *Marriott Mardi Gras Ballroom Salon A-C*
Sponsoring Units: FHP FPS

A Staged Reading of the Play: Moving Bodies BRIAN SCHWARTZ, Brooklyn College and the Graduate Center of the City University of New York — Moving Bodies is about Nobel Prize-winning physicist Richard Feynman as he explores nature, science, sex, anti-Semitism, and the world around him. This epic, comic journey portrays Feynman as an iconoclastic young man, a physicist with the Manhattan Project and confronting the mystery of the Challenger disaster. The Atomic Bomb is central to the play, but it is also very much about human loves and losses. We learn about his (Feynman's) eccentricities: his bongo playing, his penchant for picking locks, and most notably his appreciation for women. Through playwright Arthur Giron's eyes, we see how Feynman became one of the most important scientists of our time. The playwright, Arthur Giron, is the co-playwright of the recent 2015 Broadway Musical, *Amazing Grace*. The staged reading is performed by the Southern Reparatory Theatre. <http://www.southernrep.com/> The play director and actors as well as a historian-scientist who knew Feynman will be available for a talk-back discussion after the play reading.

FOEP Executive Committee News

New Members

Congratulations to the winners of the elections to positions on the Forum on Physics & Society Executive Committee. **Don Lincoln of Fermi National Accelerator Laboratory** was elected as Vice Chair. He will serve a four year term becoming Chair-Elect, Chair, and Past Chair. **Rachel Henderson of West Virginia University** was elected as student Member at Large.

The Nominating Committee, chaired by Michael Barnett, did an excellent job selecting the candidates for this election, making the choice the FOEP electorate had to make all the harder. We thank heartily the candidates who did not win this time, and encourage FOEP members to consider being a candidate next time.

New Elections

The FOEP Nominating Committee is responsible for preparing a slate of candidates for each year's election. Soon elections will be held for a **Vice Chair Officer** and for **two Members at Large**. Please vote when you get the email announcing the ballot.

We are inviting your suggestions for candidates, which should be emailed to the FOEP Past Chair, Yvan Bruynseraede (yvan.bruynseraede@kuleuven.be), or to someone from the Executive Committee. Please take the time to participate, elect your FOEP Executive Committee members, and consider getting involved in the future by volunteering or nominating colleagues who wish to serve the FOEP mission. More information can be found at <https://www.aps.org/units/foep/>.

Contributed by: Yvan Bruynseraede



Reflections and Review by our Past Chair: Michael Barnett

When you are Chair of an APS unit (such as the Forum on Outreach and Engaging the Public), you enter as Vice Chair, then move through Chair-Elect, Chair, and Past Chair. So there is a four-year involvement. My term as Past Chair of FOEP ended on December 31. You never know what team you will join when you get elected, but for me it has been a great pleasure to work with this group of enthusiastic and truly creative people. I think that we have accomplished a lot as a very new Forum. And I certainly enjoyed interacting with and learning from all of the officers.

During my tenure, the committee had many accomplishments, including our first Fellows, starting with Alan Alda. Alda is famous for being an actor and writer, but he has been a great champion of science communication. The Dwight Nicholson Medal for Outreach was transferred to FOEP from the Division of Plasma Physics, and went to people such as Charles Falco, David E. Kaplan, and our own Dan Dahlberg.

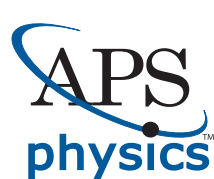
In addition to his research, Falco began (in 2001) collaborating with the British-American artist David Hockney, resulting in their discovery of scientific evidence in paintings made as early as c.1430 that demonstrated portions of them were created with the aid of optical projections. Kaplan spent several years producing the award-winning documentary *Particle Fever*, which the *New York Times* called “mind blowing”. Dahlberg has led “The Physics Force”, a K-12 outreach program, which brings excitement and wonder to thousands of students every year.

During my tenure, FOEP carried out an extensive survey of our fast growing membership (with 343 responses) from which we learned a lot about our membership, including who they are, what they want FOEP to do, and what they are doing.

A major activity for FOEP is always to provide outreach sessions at the March and April meetings, and during this era there were special talks and even plays. We collaborated with other Units (for example FEd and FHP) for some activities. We created two newsletters a year and maintained a website; these gave insights into useful outreach websites and resources, showed where funding might be obtained for outreach, and had articles about many outreach highlights. Finally, because of the APS reorganization, there was a substantial rewriting of our bylaws, which were approved by Council.

My tenure on this Committee has been productive, informative, and enjoyable. Thanks to all who contributed.

Contributed by: Michael Barnett



Kungälv, Sweden- A European Physical Society Historical Site

By Ivan K. Schuller, University of California, San Diego

If you are an ice hockey fanatic, you *may have* heard of Kungälv city in Sweden. Several National Hockey League (NHL) players are originally from there, although to the best of my knowledge none had a “hat trick.” If you are a physics fanatic, you *should have* heard of Kungälv since it possibly is the birthplace of nuclear fission. Legend has it that on a snowy 1938 Christmas, during a Kungälv walk with her nephew Otto Frisch, Lise Meitner for the first time discussed the interpretation of German experiments as due to nuclear fission. A testimony to the fact that ideas and love for physics cannot be constrained by politics, physical boundaries, or even the lack of major resources.

Kungälv is a friendly Swedish little city located close to Denmark and Norway. As with many European towns, Kungälv was at various times part of different countries and has a rich (by American standards) history. A visit to the city has as major attractions the Bohus Fortress and the Brackboden cookie and biscuit store.

Surprisingly and unlike in most visits to historical places, a tour of the city invariably includes the house where a physicist, Lise Meitner lived on and off.

Lise Meitner had a complex personal history and a very distinguished scientific career. She was born in an Austrian Jewish family, converted to Christianity, and in spite of this had to escape from Germany in 1938 for being Jewish. She studied physics and received a doctorate from the University of Vienna, held a permanent position at the Kaiser-Wilhelm Institute in Berlin, the Academy of Sciences in Stockholm, and the Royal Institute of Technology, during a time when none of these were common for women. She is credited as being instrumental in other important discoveries besides nuclear fission, such as the long-lived isotope of Protactinium and the Auger effect.

Her scientific relationships are checkered with a “who is who” in science; Planck, Boltzmann, Hahn, Bohr, Siegbahn, Chadwick, Szilard, Delbrück, and many others. She received numerous prizes, membership in many academies of science, and was honored by the National Press Club.



Photograph shows the Uddmanska house (Västra gatan 9) where Lise Meitner lived in Kungälv, an EPS Historic Site. Her spirit is present there even today.

Quite uniquely, a variety of names were given to honor her including element 109-meitnerium, craters in planets, asteroids, streets, parks, plays, and major scientific prizes. This year the European Physical Society designated the Uddmanska house (Västra gatan 9) where Lise Meitner lived in Kungälv, as an EPS Historic Site. Considering the contributions of Lise Meitner to Physics she certainly should be credited with a Physics “hat trick.”

Further information can be found at:

- EPS Lise Meitner Prize

http://www.eps.org/?NPD_prizes_LMeitner

- Gothenburg Lise Meitner Award

<http://www.chalmers.se/en/centres/gpc/activities/lisemeitner/Pages/default.aspx>

-To find out the origin of the hat trick:

<http://www.nbcsports.com/video/ever-wonder-why-three-goals-are-called-hat-trick>

How Physicists Produced a State-of-the-Art Planetarium Show

by: Michael Barnett

There were plenty of skeptics.

- How could physicists make a show for students and the public?
- How could they succeed in the strange format of a planetarium dome?
- How could they finish with much less funding than standard planetarium shows?

And yet, it has been quite successfully done! *Phantom of the Universe: The Hunt for Dark Matter* shows audiences how scientists are searching for dark matter in underground experiments and at the Large Hadron Collider, as well as the early evidence for dark matter in astrophysics. The worldwide showings have already brought in wonderful reviews.

An essential element was to get a great director, screenwriter/producer, and animators. Then for narration, we hired an Academy Award winning actress, Tilda Swinton, and for sound an Academy Award winning team at Skywalker Sound. We also worked closely with planetarium directors. Given the curved projection surface (the dome), creating a planetarium show is quite different than a show on a flat screen.

The physicists were in Michigan (Reinhard Schwienhorst), Texas (Kaushik De), and California (George Smoot and me), director in Geneva, producer/screenwriter in Los Angeles, animators in Spain, narrator in Scotland, etc. Including a couple years of fundraising, the process took over six years. Most of us had full-time jobs and had to squeeze this work into overtime.

We met at various times in person, often at planetariums so we could see if our efforts worked on a planetarium dome. We also had many Skype calls. Our director, Joao Pequeno, was constantly calling our animators and visiting them in Valencia,

reviewing progress. I spent a day in Nairn, Scotland recording our Academy Award winning narrator, Tilda Swinton, as our producer (Carey Ann Strelecki) Skyped in. Another two days were at Skywalker Ranch as the sound effects were produced and mixed with music and narration.

What actually made it possible for “amateurs” to produce this show, besides sheer determination, was the use of film professionals, though we never gave up creative control.



Tilda Swinton recording *Phantom of the Universe*

If you are interested in getting your local planetarium to present *Phantom of the Universe*, please contact me at barnett@lbl.gov. Our website is at: <http://PhantomOfTheUniverse.com/>

I close with some of the praise from planetarium directors in five countries:

- “People love the show!”
- “... a compelling planetarium show, ... accessible to a wide variety of audiences”
- “...science center staff, **high school** students, and university students ... were all extremely impressed with the show.”
- “It looks great, there are some amazing ‘wow’ set pieces, and it communicates a lot of complex science in a really accessible way.”
- “...a great experience with **middle school** boys who were very engaged throughout the show. The visuals caused them to break out into cheers, and I had thoughtful questions afterwards.”
- “It was a real success. The people were all amazed by the quality of the show.”



The animation team in Valencia (plus the director and executive producer)



The German-language premiere in Vienna.

Outreach Info & Resources

info

APS Physics Central has an “Outreach Guide!”

The guide provides ideas, opportunities, and information on how to conduct various types of outreach.

Check it out! <https://www.aps.org/programs/outreach/guide/>

And within this guide you’ll find information about:

Outreach Ideas

- [Physics on the Road](#)
- [Public Lectures - One Time](#)
- [Public Lectures - Series](#)
- [Open Houses](#)
- [Science Cafes](#)
- [Demo Shows \(on campus\)](#)
- [Working with a Museum](#)

Outreach Tips

- [Public Relations](#)
- [Working with Children and Schools](#)

Demos List

Experts

The Institute of Physics has a website devoted to Public Engagement

This website provides ideas for outreach activities, how to run an event, evaluation of an event or activity, as well as sign ups for events (in the UK).

<http://www.iop.org/activity/outreach/>

The Alan Alda Center for Communicating Science

Has many resources, and classes you can sign up for at Stony Brook University. There is a “Workshops on the Road” program that visits other locations. Check out their website for ideas and information.

<http://www.centerforcommunicatingscience.org/alan-alda/>

Questions and Ideas



Want to get more involved?

Email someone on the executive committee. Contact info can be found on the last page of this newsletter or online at:

The Forum on Outreach and Engaging the Public at

<http://www.aps.org/units/foep/governance/officers/index.cfm>

Newsworthy Items?

Have an idea for something to include in the Newsletter: An outreach activity, an idea for an article, best practices, what does and doesn't work, or something else? Please send your ideas to the newsletter editor at

FOEPAPSnewsletter@gmail.com

Web Sites that Engage and Inform the Public

info

Funsize Physics is a new, NSF-funded web resource aiming to improve the broader impacts of condensed matter and materials research, and to communicate the excitement of this research to a broad audience. The site is unique in that it includes research descriptions written for the public by researchers themselves, rather than by science writers. The curator of the site assists contributors in revising and refining their posts, helping them to present their work in ways that will be meaningful and compelling for non-experts. The Funsize Research section features short, attractive, accessible descriptions of novel physics results contributed by NSF-supported PIs. In the Funsize Outreach section, PIs can present outreach activities they have tried, discuss what worked and what didn't, and connect with groups across the country to collaborate on new outreach activities. Finally, the Funsize Classroom section allows researchers to expand the "reach" of their "outreach" by sharing how-to guides for experiments, demonstrations, and activities that may be done either in a classroom or at home. Check us out at funsizephysics.com and register as a contributor! For more information about how you can grow your broader impacts in partnership with Funsize Physics, contact site curator Jocelyn Bosley at jbosley@unl.edu.

APS Physics Central:

Physics in Action, Physics in Pictures, Physics +, Physics@Home, and more
<http://www.physicscentral.com>

OSA's Optics for Kids website:

Activities, Celebrities, Timelines, and more
<http://www.optics4kids.org/home/>

IOP Physics.org

<http://www.physics.org>

NASA Outreach Resources

<http://science.nasa.gov/researchers/education-public-outreach/>



Let FOEP Post Your Outreach Links

Does your outreach program have a website? We could list it in our newsletter. Please email your url to foepAPSnewsletter@gmail.com, and include description of site. Some examples are:

- Presentations for the general public
- Science museums
- Summer camps and programs
- Demonstrations
- K-8 outreach
- K-12 outreach

- High school and college outreach
- Physics recruiting for high school and college
- Online videos
- Contests
- Science fairs and festivals
- Ask a physicist
- Science cafés
- Other (please describe)

Contributed by: B. Parks

Funding Information

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APS grants for public outreach and informing the public

APS annually awards several grants up to \$10,000 to help APS members develop new physics outreach activities. Programs can be for traditional K-12 audiences or projects for engaging the public.

<http://www.aps.org/programs/outreach/grants/>

Marsh W. White Awards are made to Society of Physics Students Chapters "to support projects designed to promote interest in physics among students and the general public."

<https://www.spsnational.org/awards/marsh-white>

SPIE education and outreach grants for photonics and optics

As part of its education outreach mission, SPIE provides support for optics and photonics related education outreach projects.

<https://spie.org/education/education-outreach-resources/education-outreach-grants>

AAPT - American Association of Physics Teachers Bauder Fund Grants for Physics Outreach Programs

Can provide funds to obtain and or build and support traveling exhibits of apparatus.

<http://www.aapt.org/Programs/grants/bauderfund.cfm>

Alfred P. Sloan Foundation

The Alfred P. Sloan Foundation offers grants toward promoting science and science understanding to the general public.

<http://www.sloan.org/apply-for-grants/>

IOP Institute of Physics

Public Engagement Grants – open to all but only for projects that take place within the UK and Ireland

http://www.iop.org/about/grants/outreach/page_38843.html

EPS European Physical Society

Two grants that can fall into the outreach category are the EPS grant for Regional Physical Society Meetings that include items outside their usual grant categories, and EPS Award for Pre-University International Physics Competitions.

http://www.eps.org/?page=support_grants

Many institutions have their own internal outreach funding programs.

Contributed by: H.M. Doss



FOEP

**FORUM ON OUTREACH &
ENGAGING THE PUBLIC**

PHYSICS OUTREACH & ENGAGEMENT

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Physics Outreach & Engagement is a non-peer-reviewed newsletter of the Forum on Outreach and Engaging the Public, a forum of the American Physical Society. It provides information and news related to the Forum and provides a medium for Forum members to exchange ideas. Opinions expressed are those of the authors alone and do not necessarily reflect the views of the APS or of the Forum. If you would like to submit an article, commentary, letter, review, or contact us about another issue, please email the editor, FOEPAPSnewsletter@gmail.com

The Forum on Outreach and Engaging the Public can be found on the web at <http://www.aps.org/units/foep/index.cfm>