

PHYSICS OUTREACH & ENGAGEMENT

Letter from the Chair

Dear FOEP Members

Welcome to the Fall 2016 Newsletter !

This is my second report to you as Chair of the Forum on Outreach and Engaging the Public of the American Physical Society. In 2017, Itai Cohen advances to Chair, and I graduate to Past Chair.

Let me start by thanking our Editor, Heide Doss, who once again has prepared a great issue with articles from many contributors on many interesting topics. The level of effort and great quality of the Newsletter she edits is self evident and has impressed us all at FOEP. The Newsletter serves the important role of communicating activities to the FOEP membership, of initiating discussions on topics of interest, and providing a medium to hear from the members. We thank Heide for doing a great job!

I am also delighted to extend a warm welcome to our FOEP Members from the entire Executive Committee. We clearly recognize the role of science outreach and agree that it is critically important that the next generation and the public takes an interest in science.

As Chair of FOEP it has been a pleasure to see the successful continuation of many activities, which hopefully will last for a long period of time thanks to your support and engagement. Your participation in any of the FOEP activities listed in this Newsletter are welcome, as is your proposal of new initiatives. Preliminary information on those activities and highlighting some special contributions are presented in this Letter from the Chair.

* FOEP Sponsored Sessions

In 2016 we had successful and well attended sessions at the APS Baltimore and Salt Lake City meetings. For a comment on the invited sessions and the outreach happy hour meeting see the contribution by Ivan Schuller, Alice Bean and Rebecca Thompson on pages 12-14. At

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*

the March meeting FOEP also co-sponsored a special outreach session on science and cooking, and the stage reading of a play.

This Newsletter itself is your first guide to the wide variety of FOEP sponsored sessions and activities. In 2017 our Chair of the Program Committee, Itai Cohen will assemble an outstanding lineup of speakers for the FOEP invited sessions at the annual APS Meetings in Washington (January 28-31) and in New Orleans (March 13-17). FOEP will also offer several interesting and exciting special activities: focus and mini grant sessions, workshops, contributed talks, the Ithaca Physics Bus, stage reading of a science-based play, physic slam, Happy Hour meeting, etc. (See pages 14-15.)

I encourage you to attend the FOEP sessions at the March and April (January) meetings, and invite you to send us your feedback and ideas for future FOEP sessions.

* **Membership Drive**

In the March 2016 Newsletter, Michael Barnett reported on a survey of FOEP's membership. Outreach activities covered a very broad range with public talks and /or public demos far ahead of others.

Recently, Michael produced new membership statistics at varying dates. Our Forum grew substantially between 2012 (822 members) and 2016 (1781 members) although at 3.35% of the total APS membership, FOEP is still below membership percentages of other Forums (> 6%). It should be noted that FOEP membership is 26.5% female, whereas APS as a whole is 15%. Also FOEP has 52% students compared to 35% for APS and has 11% early career members compared to 7.5% for APS. (See page 11.)

FOEP members are an important ingredient in the FOEP activities and we are actively seeking new members. They can join FOEP at no cost prior to renewing their APS membership by sending an email to membership @aps.org with the request to add FOEP to their membership.

* **Dwight Nicholson Medal for Outreach**

APS also awards a variety of prizes for outstanding achievements in different aspects of the physics profession, on research, outreach, education and public service. FOEP in particular is involved in the Dwight Nicholson Medal Award, given annually, to recognize the humanitarian aspect of physics and physicists. How the 2015 Awardees, Charles Falco (University of Arizona) and David Kaplan (Johns Hopkins University), became involved in outreach activities is given in two interviews by Heide Doss (See pages 4-8). Through public lectures, exhibits, documentary films, or science related activities, they succeeded to stimulate the interest and involvement of the general public on the progress in physics.

Although the next Nicholson Award nomination cycle will not be here for little more than a year, I invite you to participate and consider nominating fellow members that would fit the criteria of the prize. Please learn more at:

<https://www.aps.org/programs/honors/awards/nicholson.cfm> , and page 9.

* **APS Fellowship**

Each division, topical group and forum in APS is eligible to nominate APS members .The FOEP has a Fellowship Selection Committee that evaluates in detail the nominations submitted by the membership. The nomination process is relatively simple, with different deadlines for the different units, but the consequences are most important. To quote from



Letter from the Chair, continued

continued
the Chair
continued

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the APS site, "*Fellowship is a distinct honor signifying recognition by one's professional peers.*" I encourage you to participate in the nomination process. Please learn more at: <https://www.aps.org/programs/honors/fellowships/index.cfm> and page 10.

*** Report from the APS Council Steering Committee**

The leadership of the APS Council is the Council Steering Committee (CSC). Gay Stewart is one of the four CSC Councilors and a member of the FOEP Executive Committee. Some important points from the 2016 Mid-year Report of the APS Council of Representatives are summarized on page 16.

***The International Solvay Institutes Outreach Activities**

From Monday October 30 through Friday November 3, 1911, twenty three leading physicists from all over Europe met at the Hotel Métropole in Brussels. For more than a century the tradition of scientific excellence continued and the activities of the International Solvay Institutes greatly expanded including an important emphasis on scientific outreach. A highlight of their activities is the yearly Solvay Public Lectures where distinguished scientists deliver lectures on the state-of-the-art in their field of research. This event popularizes science and aims at making it more attractive to the younger generations. The exciting story of the Solvay Meetings in Brussels is presented by Alexander Sevrin on pages 17-21.

Finally, I would like to take this opportunity to thank the FOEP Executive Committee, and in particular the secretary/treasurer E. Dan Dahlberg, for their tireless 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. FOEP is a thriving part of APS, and it has been a honor serving as your Chair for the past year.

Yvan Bruynseraede, Chair

The current FOEP Executive Committee members are:

Past Chair: Michael Barnett

Chair: Yvan Bruynseraede

Chair-Elect: Itai Cohen

Vice-Chair: Larry Gladney

Secretary/Treasurer: E. Dan Dahlberg

Members at Large: Alice Bean, Heide Doss, Jennifer Ross, Amber Stuver, plus APS Staff member: Rebecca Thompson

Assigned Council Representative: Gay Stewart

Editor of Newsletter: Heide Doss

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.



Letter from
the Chair,
continued

continued
the Chair
continued

Spotlights on Outreach and Engaging the Public

FOEP's 2015

Dwight Nicholson Awards for Outreach

Questions and Answers with FOEP's two 2015 Nicholson awardees, Charles Falco and David Kaplan. Answers are edited for brevity and clarity as needed.

Charles M. Falco University of Arizona

Charles was awarded "for his award-winning *The Art of the Motorcycle*" exhibition for the Solomon R. Guggenheim Museum (co-curator), and his work with the renowned artist David Hockney on the optical science utilized by the grand master artists; each unique project has made the public aware of the contributions of science to their daily lives."

Q. How did you get involved in outreach?

A. I'm not sure the present concept of outreach even existed when I first found myself involved in it by judging a science fair when I was a graduate student. I hadn't even volunteered, but rather it was foisted on me by one of the professors. However, it turned out to be a very positive experience that showed me there was a need for, and genuine appreciation of, outreach activities. That initial exposure was the trigger that led to my increasing involvement in activities to show the importance of science to the general public.

Q. What do you find most exciting about outreach?

A. Let me answer this with an example. Some time ago I gave two talks at the University of Illinois, a condensed matter seminar one day and a public lecture on my work with David Hockney another. Illinois has a large condensed matter program so ~30 people attended my seminar, after which there were a couple of polite questions and it was over. However, since all of them already knew a great deal of physics my seminar increased their total knowledge of the subject by epsilon. In contrast, the auditorium for my public lecture had hundreds of people, nearly all of whom stayed for the question period until finally the host had to cut things off nearly an hour later. Further, the discoveries about art and optics I described changed their understanding by a significant amount. For me, what's exciting about outreach is that in a given amount of time I can reach a much greater number of people, and I can have a much bigger effect on each of them, than when giving a research talk to an audience of scientists.



"I personally have no doubt that there has been a positive effect of my outreach activities on my scientific research."



"...three bits of advice are: have an interesting story to tell; practice on ever larger audiences to refine your ability to tell that story in the most interesting way; and cultivate contacts outside your scientific world to increase the chances that opportunities to engage the public will be brought to your attention."

Q. Is it difficult to juggle your scientific research in condensed matter physics and continue to do outreach projects?

A. I've been asked that before, and I still don't have a good answer. Although the time I spend, say, working with David Hockney is time I don't spend doing condensed matter physics, my research in that area has been continuously funded since graduate school. However, what I can't quantify is how the insights I get from someone like him improve, change, affect, etc. the physics I do. I personally have no doubt that there has been a positive effect of my outreach activities on my scientific research.

As for whether it is "difficult," the answer is 'no' because I haven't consciously struggled to juggle things. I've been lucky to be able to pursue whatever has most interested me, in and out of physics, and obtained outcomes that other people find interesting as well. As an example of *not* juggling, on a trip to speak at a scientific conference in Canberra earlier this year I also gave public lectures at the National Gallery of Australia, and to a large gathering of regional motorcycle clubs. I didn't have to juggle between activities since I could do all three.

Q. You've given over 400 invited talks in 32 countries. What were your favorite and worst experiences? What is your impression of the impact you are having on the global community?

A. I've been to a lot of interesting places so it's hard to limit this to just one story, but one set of memorable experiences happened within a few weeks of each other in the early 1990s. I had been at a two-week conference on the Greek island of Mikonos where the surroundings and the scientific program were excellent. However, my hotel room had no A/C and the shower was basically salt water. On a 10 point scale it was a 1 since it was the worst conference experience I had had up to that time. However, a few weeks later, after a long set of flights followed by an overnight train that took eight hours to cover just 200 miles, I found myself at a conference in a former Young Pioneers camp in Russia. There was no coffee, no heat, no indoor plumbing, and no just about anything else. Mykonos moved up the scale to an 8 after Russia. The moral of this is, no matter how bad you think it is you should make the best of it because it could be a lot worse.

Impact is something that is impossible for me to quantify. However, another story illustrates why I have the impression the impact is significant. I gave a public lecture at the Guggenheim Bilbao (Spain) as part of their 5th Anniversary celebration. After the question and answer period ended, when the person who did the simultaneous translation came to retrieve my headset, he told me that he had worked at the museum from the beginning and this was only the second time the auditorium had been filled. I asked him what had been the other time. Ironically, it had been when Dennis Hopper spoke at the opening of 'The Art of the Motorcycle'.

Q. How did you get involved in the Motorcycle exhibit? In art?

A. I'm an academic, so of course I like books. I also like motorcycles, so taken together it's not surprising I like motorcycle books. It turns out I've collected what is probably the world's largest private collection of English-language motorcycle books (and a lot in other languages), with over 90% published since 1897. Making a long story short, when the Director of the Guggenheim had the idea of doing an exhibition on "The Art of the Motorcycle" he needed it curated and I'm probably the closest thing to a "motorcycle scholar" one could hope to find.

I've been very interested in photography since elementary school so my involvement in art goes back a long way. By Jr. High I had built my own enlarger from an old bellows camera and started working with alternative photographic processes. By high school I was making stop-motion 8 mm movies and

experimenting with infrared film and silk screening. A few years ago the art critic for 'The New Yorker' wrote, "*An efficient test of where you stand on contemporary art is whether you are persuaded, or persuadable, that Chris Burden is a good artist. I think he's pretty great.*" In graduate school I took part in one of Chris's performance art pieces ('220') and helped him with several others.

Q. If you could give only three bits of advice to scientists on how to engage the public, what advice would you give?

A. This is your toughest question since my activities that have had the greatest impact on the public came about totally through luck. And preparation. My lifelong "academic" interest in motorcycles had given me the background necessary to curate the exhibition at the Guggenheim, but it was through luck that the Director found me. My lifelong interest in art gave me the background to effectively communicate and collaborate with David Hockney, but it was through luck that we were put in contact. But, to try to answer your question, my three bits of advice are: have an interesting story to tell; practice on ever larger audiences to refine your ability to tell that story in the most interesting way; and cultivate contacts outside your scientific world to increase the chances that opportunities to engage the public will be brought to your attention.

David Elazzar Kaplan, Johns Hopkins University

David was awarded "*for his extraordinarily innovative and effective efforts in public outreach, and in particular for his production of the documentary film, Particle Fever, that allows nonscientists to experience the scientific world and discoveries as they really are.*"

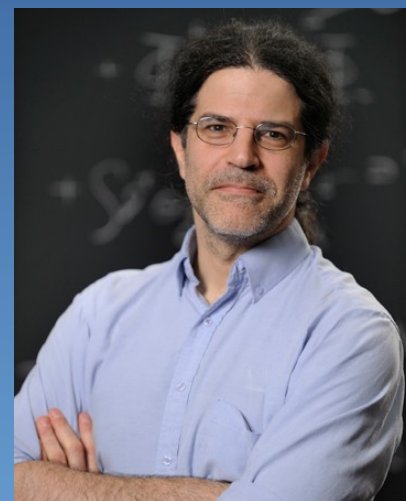
Q. How did you get involved in outreach and in making a documentary film?

A. I didn't think of it as 'outreach'. I had been talking about what was going on in the field of particle physics to my friends and family for years and one of them thought it was so dramatic, it should be recorded somehow. I decided to do just that -- more of a history of science project, not communication. So I started interviewing people asking what they thought would happen when the Large Hadron Collider turned on. Another friend said I should record the interviews on film....

At that point I decided to make it a documentary film. I actually started as a film major in college and then switched to physics (and transferred to UC Berkeley) because I thought I would never make it in film, and I liked physics.



Lauren Hutton Laurence Fishburn Sir Bob Geldorf
Frank Gehry Jeremy Irons Jeanne Marine



"...what I really learned is that I don't want to make movies for a living -- I want to make discoveries. That's what I want to struggle with, and what I want to dream about at night."

"It is important that, whatever you choose to do with your life, you like the grunt work. There is grunt work in physics, like anything else, and I like it a lot. I can't even help myself but do it."

I bought myself a camera sometime around 2006 and started interviewing people. The quality was terrible, and my sister suggested I talk to a TV director in NYC that she thought I would love. She was right, and (using half of my Sloan Fellowship), I paid him and his team to make an 8-minute teaser to help raise money for the larger film.

A very long story later (and a different director, multiple producers, years of fundraising, two cinematographers, two editors, and some of the most difficult years of my life), we finished a film.

Q. What was the most unexpected things you learned in film making? The most fun? The hardest? What was the worst experience in film making?

A. There were some great experiences along the way, but making the film was very painful. I tried to do it part time for the first number of years, and things often went badly. The director and I had a very poor relationship. I felt my vision was disrespected, and eventually, I had enough money to hire an editor so another 'set of eyes' would be watching the process. I felt vindicated a number of times along the way, but I still harbor resentment. It was an ugly process, and I know much more now than I did then. But what I really learned is that I don't want to make movies for a living -- I want to make discoveries. That's what I want to struggle with, and what I want to dream about at night.

It is important that, whatever you choose to do with your life, you like the grunt work. There is grunt work in physics, like anything else, and I like it a lot. I can't even help myself but do it.

Q. Is it difficult to juggle your scientific research and continue to do outreach projects?

A. It is nearly impossible. You can only do one thing really well at a time. Right now, I am dedicated to physics. I have an outreach project I want to do, but I doubt I will be able to do it. I am not a perfectionist, but I am almost never satisfied with what I have accomplished, and keep wanting to do better.

Q. How do you think you've affected the general public with your outreach efforts?

A. We have been able to estimate that at least 1.5 million people have seen Particle Fever, and probably closer to 2 million. People recognize me on the street and tell me how moved they were by the film. Some have even told me they changed their careers or switched their college major or simply became more motivated in their research because of the movie. More than once after a screening and Q&A, a young teenager, usually female, would ask how she can pursue physics. At film festivals, people who have never thought they would have any interest in physics were crying by the end of the film.

That's what I know. It seems like it 'worked', whatever that means.

Q. In the film you point out how science brings together people of all sorts of backgrounds, including those who come from countries with long standing tensions. It resonated with me. That led me to wonder if your display of this very international group of scientists, this world effort of discovery, had an impact on the international community. I don't know how you would measure that, but it seems you do have some evidence on how your film impacted the general public and their views on science.

A. I don't really know how I would measure the global impact. The cooperation is definitely something that inspires me, which is why I wanted it emphasized in the film.

Q. Do you think scientists should make sharing their research to a general audience a personal story, or should they try to remove personal biases and let impartial facts speak for themselves?

A. I think being rational and logical are obviously critical. Attempting to apply that attitude at all times I think is a good thing. Sometimes, it is not possible, and it is in those moments of failure when we feel inspired. Discoveries are hard because they are non-intuitive -- otherwise, they would have been made already!

I think it is good for a scientist to dig deep and understand why they are doing the work they are doing. Even if it means years of self-doubt. That questioning is part of being rigorous. We should not have pat answers as to why our work is important -- it should be real, and if we aren't really sure, then that's the answer.

I am not very interested in the training of scientists to be more 'personal'. I think it should come from the opposite side. I had my original production team (before Mark Levinson and company) make a short video about a physicist, Kyle Cranmer of NYU. They started interviewing him, and let him talk physics, as technical as he wanted, for an hour before asking personal questions. After that hour, Kyle was completely in his comfort zone, and all of the personal feelings came out.

You see, the people recording and interviewing physicists often think the work is impersonal and look for an angle. But in fact, it is the work itself that makes us so passionate. When we are pushed to explain it to the public, it is hard work, and often that effort masks our true joy in doing it. But I now realize there are techniques to extract the real feelings from scientists -- deep feelings that we all have in different ways.

Humans are complicated. I believe our job is to inspire others and to be humble. Eloquence helps bring people along. Humility reminds you that we are in the 'truth business,'[†] and we should check in with the truth as often as possible.

Q. If you could give only three bits of advice to scientists on how to engage the public, what advice would you give?

A. Only one piece of advice. Do it because you can't help yourself -- not because you think you have to.

“Humans are complicated. I believe our job is to inspire others and to be humble. Eloquence helps bring people along. Humility reminds you that we are in the ‘truth business,’[†] and we should check in with the truth as often as possible.”

[†]'Truth business' is a common phrase used by Dr. Savas Dimopoulos, who is featured in Particle Fever.

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>

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.

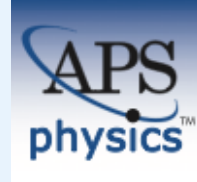


FOEP

**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

FOEP Statistics

FO
EP

Quarterly report on FOEP Membership

1,781 Official Counts January 2016

Official counts by Year

2012 822 = 1.64%

2013 1,145 = 2.31%

2014 1,350 = 2.67%

2015 1,525 = 2.96%

2016 1,781 = 3.35%

FOEP Statistics January 2016

569 Regular not other categories

113 Regular Fellows

18 Lifetime Fellows

54 Senior

33 Senior Fellows

919 Students = 52% compared to APS 35%

195 Early career = 11% compared to APS 7.5%

473 Female = 26.5% compared to APS 15%

1,187 Male = 66.6%

36 Female Fellows = 22.0%

128 Male Fellows = 78.0%

FOEP Membership

We have a winner!



Dr. Nate Tompkins,
Brandeis University,
FOEP member

FOEP would like to congratulate the winner of the FOEP membership drive raffle, Dr. Nate Tompkins from Brandeis University. Nate won a Pebble SmartWatch!

Nate says, "I signed up for the Forum on Outreach and Engaging the Public because my academic goal is to bring the wonders of physics to the public... At the March Meeting I saw a community of likeminded scientists that I look forward to learning from and potentially partnering with."

When asked about his recent work, Nate said, "My current position at Brandeis is the MRSEC Assistant Director of Research and Education, which includes coordinating and leading various outreach activities in Waltham, MA. Most recently I taught a curriculum development continuing education course for current high school science teachers entitled Partnership for Curriculum Development, which connected science educators with science researchers to develop novel curricula connecting the process of science with the process of education. This upcoming year I am organizing a series of events with a similar focus to bring researchers and educators together to show the passion and process of science."

We are excited to have Nate as a member of FOEP! Nate was selected at random from qualified entrants. New FOEP members were entered once. For current FOEP members, they were entered twice for each person they signed up.

Contributed by: J. Ross



MARCH
MEETING 2016

FOEP at March Meeting 2016

At March Meeting 2016 FOEP and the APS Outreach Department hosted a day of outreach. For the first time FOEP put together a session of contributed papers. It was excellent, ranging from reports from the APS Outreach Mini Grant recipients to a history of World War II. Consider contributing a paper to the FOEP session at APS March Meeting 2017. *These talks do not count against you, so you can still submit a scientific presentation.*

Prior to the contributed session FOEP hosted an invited session featuring 5 amazing speakers (more on that in the next article). The day finished with an outreach happy hour to bring together those doing outreach. It was a fantastic networking opportunity and a chance for people to talk shop. It also was a chance to recognize this year's FOEP fellows. Each year FOEP nominates members to become Fellows of the APS. This year 3 fantastic FOEP members were given this honor. APS March Meeting 2017 will again feature a day full of outreach and engagement activities. Be sure to put everything from sessions to happy hour on your schedule.

Contributed by: R. Thompson



From left to right: Philip Hammer, Jennifer Ross, Don Lincoln, Daniel Steinberg, and Itai Cohen. Two of the four FOEP nominated APS Fellows awarded in 2015 display their certificates during the outreach happy hour.



FOEP at March Meeting 2016

Outreach and Engaging the Public - Wednesday March 16, 2016, 11:15-2:15

The FOEP sponsored a very well attended, by now traditional session, at the 2016 March Meeting, in which various Public Outreach approaches were presented. These were all aimed at a general audience of participants in the APS March meeting.

Ray Orbach, who was Under Secretary of Science of DOE from 2006 to 2009, and is now at the University of Texas, presented a unique perspective on *How to Interact with Congress about Science*. He emphasized that all scientists have an important urgent role in this interaction and that to be effective, personal interactions are crucial. He highlighted the fact that authorization bills are in play which affect science funding in an essential way and that we all have an important role to play. Marc Schulman from the USA Science and Engineering Festival (USA-SEF) discussed *How to Organize a World Renowned Science Festival*. The USA-SEF is probably the world largest science festival and was started in San Diego by Larry Bock, a visionary venture capitalist who was a true believer on the importance of scientific outreach to the public. Schulman highlighted the many activities that that the USA-SEF sponsors with the participation of well known scientists, high technology companies and academia. Joel Shurkin, in a well-documented talk, described *How to Write a Scientist Based Biography for the Public*. He discussed particularly the writing of his biography, the controversial Broken Genius: The Rise and Fall of William Shockley, Creator of the Electronic Age. A particularly interesting aspect was the difficulty in writing a biography of a person who the author does not admire personally, but who nevertheless has made a major contribution to science. *How Physics World Reaches Out in a Digital Age*, was the subject of Martin Durani's talk. The editor of Physics World pointed out that in recent years, technology has changed the way in which science should be communicated to new audiences. Important ingredients which were highlighted are: having a good story to tell, keeping in mind the audience, using the proper media, and exploiting the visual power of video. In a humorous talk, Jeremie Palacci, a young professor from the University of California-San Diego described

how to explain *Physics in a Brewery*. He discussed the science of beer making and showed a number of tricks, which caught the attention of the audience. Overall this is a very entertaining, well-attended set of invited talks, dealing with Public Outreach and should be definitely continued for the foreseeable future.



Contributed by: Ivan Schuller

The chairman of the session Y. Bruynseraede studying the by-product of the talk on the Physics in a Brewery, by Jeremie Palacci.



FOEP at April Meeting 2016

At the FOEP sponsored session at the April APS meeting in Salt Lake City, three invited speakers gave presentations. Prof. Thomas Hertog, from the University of Leuven in Belgium, who is an internationally renowned cosmologist and collaborator of Stephen Hawking, talked about the origin of our universe, from Quantum to Cosmos. Dr. Rolf Landua, who is the head of education and outreach at CERN, discussed CERN's approach to public outreach. Finally, Prof. Alice Bean, a particle physicist from University of Kansas, talked about her recent experience as a Jefferson Science Fellow with the U.S. Department of State and engaging the public on climate change issues.

Contributed by: Alice Bean



FOEP at Future Meetings

Finding your scientific voice:

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. The workshops will be held at the APS Division of Fluid Dynamics (DFD) meeting in November and the APS March meeting. 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. Please look to the meeting websites for information on how to sign up.

Contributed by: Itai Cohen

Visit our invited sessions at the next March and/or April meetings – or give a contributed talk and double your exposure!

APS March Meeting March 13-17, New Orleans, LA
FOEP invited session speakers include Amber Stuver, The Physics Bus group, and more. Look for a FOEP, FHP cosponsored staged reading of a science-based play Wednesday evening at 8 PM



APS April meeting January 28-31, 2017, Washington DC, FOEP
Invited session speakers include David Kaplan, Rachel Wolf, and more. Look for a FOEP, FHP cosponsored staged reading of a science-based play Sunday evening at 8 PM



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 Future Meetings

The Ithaca Physics Bus is coming to New Orleans!

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!



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

APS Council Report

The Council of Representatives (Council) is an essential part of the leadership of the APS, along with the Presidential Line (PL), and other Officers of the Society, the Board of Directors (Board), the Chief Executive Officer (CEO), and other senior APS staff. The Board has responsibility for all fiduciary matters and governance. The Council has responsibility for matters concerning the units, members, fellows, prizes and awards, meetings, publications and policy statements. In addition, most of the standing committees of APS are Council committees or Joint committees of the Council and Board. At the 2015 APS leadership convocation those units that do not have a Councilor requested more direct representation, and the Council Steering Committee (which was one of the changes that grew out of the APS governance reform) modified Council practice to ensure all APS units were represented.

All Divisions and larger Forums have a Councilor. There are two Section Councilors to represent the ten Sections. Two elect Councilors on a rotating basis so that a new Section Councilor is elected every 2 years. The other sections are assigned one of the two Section Councilors to act as their Council Representative. The Units who do not have their own Councilor (Topical Groups and small Forums such as FOEP) are assigned a Council Representative. In FOEP's case, that is the Forum on Education Councilor.

The Council last met in April. Some of the things we have approved this year include the approval of the transition of the Topical Group on Gravitation to Division status with the name and acronym Division of Gravitational Physics (DGRAV), and establishing a new Topical Group on Medical Physics with the acronym, GMED. Several Units are strongly involved in the APS April meeting, and there have been some concerns as to the vitality of that meeting. The Council created an April Meeting Subcommittee that worked with stakeholders and examined the results of earlier studies. The Council adopted their Subcommittee's recommendation to establish a rotating Chair Line for the Program Committee to enhance continuity on the Program Committee. This continuity will enhance the ability to plan and organize successful meetings with interesting themes that are of significant value to the attendees. The structure went into place this year, and an exciting 2017 meeting is already taking shape. Note that in 2017, the "April" meeting will be January 28-31.

Remember, the Forums represent the cross-cutting interests of APS. The Forums now are all fully represented on Council, which concerns itself with the policy and scientific direction of the Society. Your Forum Executive Committee is a great way to share your ideas for making APS even better!

Contributed by: Gay Stewart



The Solvay Meetings – Impact on Outreach Activities

By Prof. Alexander Sevrin

Brief History

From Monday October 30 through Friday November 3, 1911, 23 leading physicists from all over Europe met at the Hotel Métropole in Brussels to discuss about “la théorie du rayonnement et les quanta”, the theory of radiation and quanta. The initiative for this conference was taken by Ernest Solvay, a prominent Belgian industrialist with a keen interest in science, and the conference was chaired by Hendrik Lorentz.

In 1912 Ernest Solvay founded the International Institute for Physics followed in 1913 by the creation of the International Institute for Chemistry. In 1970 the Solvay family in association with the Université Libre de Bruxelles (ULB), and the Vrije Universiteit Brussel (VUB), merged both Institutes and established the “International Institutes for Physics and Chemistry, founded by Ernest Solvay”.

For more than a century the tradition of scientific excellence continued and the activities of the International Solvay Institutes greatly expanded including an important emphasis on scientific outreach.



Photograph of participants of the first Solvay Conference, in 1911, Brussels, Belgium. Seated (L-R): Walther Nernst, Marcel Brillouin, Ernest Solvay, Hendrik Lorentz, Emil Warburg, Jean Baptiste Perrin, Wilhelm Wien, Marie Curie, and Henri Poincaré. Standing (L-R): Robert Goldschmidt, Max Planck, Heinrich Rubens, Arnold Sommerfeld, Frederick Lindemann, Maurice de Broglie, Martin Knudsen, Friedrich Hasenöhrl, Georges Hostelet, Edouard Herzen, James Hopwood Jeans, Ernest Rutherford, Heike Kamerlingh Onnes, Albert Einstein, and Paul Langevin

Main Focus and Uniqueness

Today the main focus of the International Institutes for Physics and Chemistry founded by Ernest Solvay is still the organization of the International Solvay Conferences. It follows a three year cycle: in year one there is the Physics Conference, in year two there is no conference and in year three there is the Chemistry Conference. The last and 26th Solvay Physics Conference took place from October 9 through 11, 2014. Its theme was “Astrophysics and Cosmology” and it was chaired by Roger Blandford from Stanford University. The 24th Solvay Conference on Chemistry will be held in October 2016.

The Solvay Conferences on Physics are unique among physics meetings and have followed the same setup since their very inception. The Scientific Committee for Physics of the Solvay Institutes is in charge of the Conferences. The Committee consists of ten outstanding physicists appointed for a six year period,

renewable once.¹ It defines a theme in physics of current interest and appoints a chair for the conference. From then on the chair assumes full responsibility. He or she drafts a list of 40 to 60 invitees, all leading experts in the theme addressed during the conference. In addition, five important questions within the theme are defined to each of which half a day is devoted. Each of these sessions is prepared by the session chair in close collaboration with the chair of the conference and starts with a brief review of the state of the art by the rapporteur. The bulk of the session is then fully devoted to a round table discussion, which makes the Solvay Conferences very different from other conferences in physics. Since the first Solvay Conference the discussions are reproduced verbatim in the proceedings thus providing a remarkable testimony on the thoughts and convictions of outstanding physicists at that given time. As an example, the last Solvay Conference on Physics held in 2014 addressed current problems in “Astrophysics and Cosmology” and the five sessions were devoted to: Neutron Stars, Black Holes, Cosmic Dawn, Dark Matter, and the Microwave Background. About 60 invited experts, coming from very different subdisciplines of astrophysics and cosmology, had over three days numerous lively, cross-fertilizing, and sometimes even contentious discussions.²

Other Highlights

While the Solvay Conferences on Physics and Chemistry remain the core business of the Solvay Institutes, numerous other initiatives are taken as well. Every year the Institutes organize four or five topical high level workshops that run over three to five days, focus on important developments in both physics and chemistry and are heavily attended by scientists from Belgium and its neighboring countries. Some topics recently covered were: Quantum Simulation with Cold Matter and Photons, Conceptual Quantum Chemistry, Bridging the Gaps at the PCB Interface - Multiscale Modeling in Physics, Chemistry and Biology, and Nonequilibrium and Nonlinear Phenomena in Statistical Mechanics.

The yearly International Jacques Solvay Chair in Physics and the International Solvay Chair in Chemistry attract eminent scientists who pass one or two months in Brussels, collaborating with the local scientists and giving Master Classes to doctoral students, postdoctoral fellows, and faculty from all over the country. The Master Class is preceded by an inaugural lecture aimed at a wider audience. The 2015 Jacques Solvay Chair in Physics was held by Peter Zoller who lectured on quantum information and quantum computing.

A monthly colloquium where hot topics are presented by eminent scientists serves the local physics and chemistry community. An extensive doctoral school “Quantum Field Theory, Strings and Gravity” is organized every year in collaboration with the ULB, the VUB, the University of Amsterdam, various institutions in Paris headed by École Normale Supérieure (ENS), and various institutions in Switzerland led by the Swiss network "SwissMap" (ETH Zürich, U. Bern, U. Geneva, CERN) providing first-year PhD students with advanced courses in theoretical physics that help bridge the gap between Master-level courses and the most recent advances in the field.

In addition to this the International Solvay Institutes contribute both logistic and financial aid to numerous scientific and outreach events in and out of Belgium.

¹ The composition of the Scientific Committee for Physics, currently chaired by David Gross, can be found on the website of the International Solvay Institutes: www.solvayinstitutes.be where a lot of information on the International Solvay Institutes and its activities can be found.

² For the interested reader, the proceedings make a wonderful read and provide a timely account of some of the most pressing problems in the field: “The Proceedings of the 26th Conference on Physics, Astrophysics and Cosmology”; R. Blandford, D. Gross and A. Sevrin, editors; 2016 World Scientific; 13 + 357 pages.

Outreach Activities

One of the absolute highlights of the activities of the International Solvay Institutes are the yearly Solvay Public Lectures that take place in the magnificent setting of Studio 4 in the Flagey Building. The Flagey Building is a beautiful edifice in modernistic style constructed from 1935 through 1938 and located on the edge of the Flagey Square and next to the Ixelles ponds in Brussels. During the Solvay Public Lectures, which started in 2005 and are usually held on a Sunday afternoon in October, distinguished scientists deliver lectures on the state-of-the-art in their field of research with an overview of the most pressing current issues.

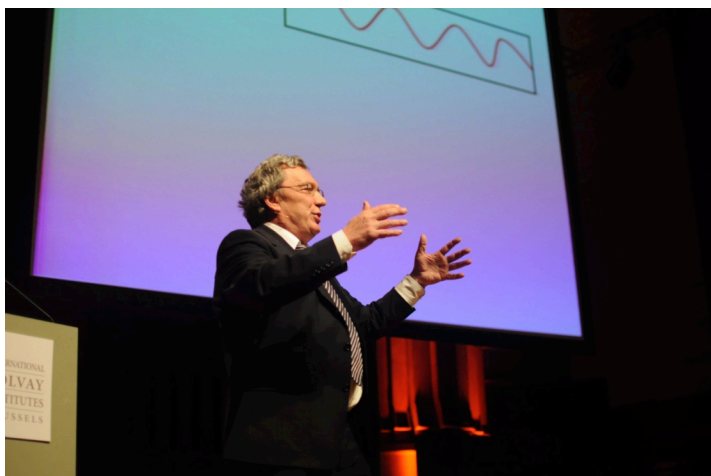
Organized jointly with the ULB, the VUB, and the Solvay Group, this event popularizes science and aims at making it more attractive to the younger generations. The talks are given in English but simultaneous translations into Dutch and French are provided. The lectures are followed by a debate where a panel consisting of renowned scientists address questions from the audience. The event closes with a drink offered to all the participants, allowing the public to interact directly with the invited scientists. The event is free and every year the 862 seats of Studio 4 are solidly packed!



Every year again the Solvay Public Lectures attracts more than 800 interested people in the magnificent Studio 4 of the Flagey Building in Brussels. Shown here: Reinhard Genzel in 2015 talking about “Massive Black Holes and the Evolution of Galaxies”.

To give a flavor of the diversity of topics addressed during the Solvay Public Lectures and the excellence of the lecturers, I list the speakers and topics since the Centennial of the Solvay Institutes. In 2011 under the theme *The Future of Physics*, William Phillips talked on *Time and Einstein in the 21st century*, and Frank Wilczek on *Quantum Beauty*. In 2012 George Whitesides discussed *The Science of Simplicity*, Michael Freedman considered *Will our Thinking Become Quantum-Mechanical?*, and Kurt Wüthrich presented *Exploring the Postgenomic Protein Universe*. The next year the audience was entertained by presentations by Joachim Frank on *How proteins are made in the cell: Visualizing the ribosome in action* and Jason Chin on *Reprogramming the genetic code*. In 2014 three talks were delivered: Conny Aerts on *Starquakes and Exoplanets in our Milky Way galaxy*, Martin Rees on *From a ‘simple’ big bang to our complex cosmos*, and François Englert on *The Brout-Englert-Higgs mechanism and its scalar boson*. Last year one hundred years of Einstein’s general relativity was celebrated by talks by Reinhard Genzel on *Massive Black Holes and the Evolution of Galaxies* and Viatcheslav Mukhanov on *From Nothing to the Universe*. This year’s Public Event has *Chemistry for the World of Tomorrow* as its theme, and lectures by Robert Grubbs on *Translation of Academic Science into the Commercial* and Ben Feringa on *The Art of Building Small* will be delivered.

Since its start in 2005, the Solvay Public Lectures have grown into one of the most visible and popular scientific outreach events in Belgium. Its success clearly demonstrates that public outreach by physicists and other scientists is more than ever needed! As Jean-Marie Solvay, the great grand-son of Ernest Solvay and the President of the International Solvay Institutes states: “We need scientists to be heard and to be lauded, we need to show that science is a fascinating subject raising intriguing and captivating challenges, and we need to demonstrate that it is extraordinarily important for the future of humanity to pursue scientific advances, which are critical to the survival of human beings on earth. Hence our commitment to public events and lectures.”



Viatcheslav Mukhanov presenting his outreach talk “From Nothing to the Universe” at the 2015 Solvay Public Event “One Hundred Years of Einstein’s General Relativity”.

The Hotel Métropole – European Physical Society (EPS) Historic Site

The Hotel Métropole was the venue of the first Solvay Council. After that both the Solvay Conferences on Physics and those on Chemistry moved to other places in Brussels (and even a few times abroad). However since the 23rd Solvay Conference on Physics “The Quantum Structure of Space and Time” in 2005 the Solvay Conferences returned to the Hotel Métropole where they are being held ever since.

Recognizing the profound influence of the Solvay Conferences on physics, the EPS decided to bestow its Historic Site Award to the Hotel Métropole. On October 2015, a commemorating plaque was unveiled in the lobby of the hotel by Christophe Rossel, president of the EPS, and Jef Ongena, president of Belgian Physical Society (BPS). The ceremony was preceded by an academic session.³ The attendance included members of Belgian and European academic and political institutions. Guests of honor were fourteen direct descendants of the Nobel Laureates that were present in 1911, three descendants of Ernest Solvay, and Mr. Wielemans, heir to the family that founded this Brussels landmark hotel.



Christophe Rossel, President of the EPS, and Jef Ongena, President of the BPS, unveiling the EPS Historic Site plaque. It is now exhibited on top of the historic 1911 picture in the lobby of Hotel Métropole.

³The EPS Historic Site Award celebration was accompanied by the publication of a Special Topic Issue of the European Physical Journal: “The Early Solvay Councils and the Advent of the Quantum Era”; EPJ ST, Vol. 224, September 2015; F. Lambert, F. Berends and M. Eckert, editors.



More than a century later: the direct descendants of the participants to the 1911 Solvay Conference in Physics gather in October 2015 in the Hotel Métropole when the European Physical Society bestowed its Historic Site Award to the Hotel. Seated (L-R): Dieter Klingmüller [W. Nernst], Ursula Klingmüller [W. Nernst], Jean-Marie Solvay [E. Solvay], Anna de Haas [H. Lorentz], Yann Lapicque [J.-B. Perrin], Françoise Chapuis [J.-B. Perrin], Paul Siebertz [W. Wien], Maria Rüchardt [W. Wien], Pierre Joliot [M. Curie]. Standing (L-R): Florian Baier [A. Sommerfeld], Monika Baier [A. Sommerfeld], Nathalie Ferrard [A. Einstein], Mary Fowler [E. Rutherford], Catherine Kamerlingh Onnes, Jeanne Kamerlingh Onnes.



The Solvay Public Event also provides a perfect forum for the ceremony attributing the Solvay Awards honoring outstanding young physicists and chemists for their Master and PhD theses.



Alexander Sevrin is a professor at the Free University Brussels (VUB) and founder of the Theoretical High Energy Physics Group whose members investigate aspects of elementary particle physics and cosmology. He is a guest professor at the universities of Antwerp and Leuven. He is the deputy director and the scientific secretary for physics of the International Solvay Institutes for Physics and Chemistry. He sits on the board of directors of several organizations among which the Francqui Foundation, the largest Belgian private science foundation. He is member of the Royal Flemish Academy of Belgium for Science and the Arts.

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



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FOEPAPSnewsletter@gmail.com

Web Sites that Engage and Inform the Public

info

The Particle Adventure

“An award winning interactive tour of quarks, neutrinos, antimatter, extra dimensions, dark matter, accelerators, and particle detectors.” By the Particle Data Group of Lawrence Berkeley National Laboratory
<http://particleadventure.org>

Physics Department outreach at UC Santa Barbara

<https://www.kitp.ucsb.edu/outreach>

Physics Outreach Queen Mary University of London

<https://www.youtube.com/watch?v=0Nt16ZvGjAM&list=PLDud2rn4SK3Megin79aYBDkOEmJWdc8g>

Science at Home – help researchers build a quantum computer!! (It’s fun!)

<https://www.scienceathome.org/games/quantum-moves/game>

Physics Girl

<https://www.youtube.com/user/physicswoman>

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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MEMBER AT LARGE: AMBER STUVER (01/16 - 12/17) LIGO – LIVINGSTON OBSERVATORY

Forum on Outreach and
Engaging the Public
American Physical Society

One Physics Ellipse
College Park, MD 20740-3844

[Recipient]

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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>