

# PHYSICS OUTREACH & ENGAGEMENT

## Letter from the Chair

Dear FOEPies and FOEPers

This is the second Newsletter of the Forum on Outreach and Engaging the Public. As Chair of FOEP it has been my privilege and pleasure to see the start of many new activities, which hopefully will last for a long period of time. FOEP is nucleating those of us that think that explaining, “what physics is all about,” is a very important and rewarding activity. As discussed in our last Newsletter “engagement” is not the same as “education.” We see our main task as advertising the importance and the role physics plays for the development of a modern society and for the establishment of the scientific basis for new technologies of the future. We must face it! The general public does not understand what and how we do it, and it is our obligation to spend some time in explaining it to them.

YOU are the most important ingredient in the FOEP activities. Your participation on any of the activities listed below, and/or proposing new initiatives, is extremely welcome and an excellent contribution. Please consider participating in any form you feel is appropriate.

Since the creation of FOEP, several activities have been started, supported and hopefully will be expanded. These include:

- 1) The public lecture before the March meeting. Jim Kakalios has given extremely well attended lectures on the “Physics of Superheroes”. This was very generously sponsored financially by DMP and DCMP.
- 2) We actively contribute to the “Physics for Everyone” symposium at the March meeting, which the Division of Materials Physics sponsors.

*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](mailto: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 \$8 for every Forum membership over two.

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A forum of the American Physical Society*

- 3) We cosponsored together with the Forum of History of Physics an Invited Session on the “History of the Communication of Science to the Public.”
- 4) We co-sponsored the reading of several physics based plays at the March and April meetings.
- 5) We are planning a new “Physics Slam” at the next March meeting, which we hope will attract new ideas on how to explain physics to non-expert audiences. Please watch out for notices and calls for participation.
- 6) We are sponsoring the Nicholson Medal for Humanitarian Service and Outreach. Soon you will receive a call for nominations. Your active contribution to this is important and would be greatly appreciated.
- 7) We have elected our new APS Fellows presented by FOEP. Watch out for the announcement soon. Nominations for next year Fellows will be sent to you soon.

We thank all those that have run for election for the FOEP Executive Committee. The new elected members are:

Vice Chair: Yvan Bruynseraede

Secretary/Treasurer: E. Dan Dahlberg

Members at Large: Philip W. Hammer and Jennifer Ross

We thank outgoing members of the committee:

Paul Chaikin

Diandra Leslie-Pelecky, and

Beth Parks.

Ivan Schuller

*Hi!*

## Letter from the Chair, continued

CONTINUED  
THE CHAIR  
FOEP FELLOWS

## Spotlight on Outreach and Engaging the Public

### DR. VINCENT RODGERS AND HAWK EYES ON SCIENCE, UNIVERSITY OF IOWA

Dr. Vincent Rodgers, a string theorist and Professor of Physics, and Mr. Dale Stille, an Instructional Resource Specialist, are a dynamic duo. Dr. Rodgers currently advises five Ph.D. students and two undergraduate students, has taught graduate and undergraduate classes in subjects such as general relativity, quantum field theory, string theory, computational physics, electrodynamics, as well as introductory physics, is currently co-director and founder of Café Scientifique of Iowa City (one of the first ten Café Scientifiques in the US), and is co-director and co-PI of the Iowa Biosciences Advantage Program. Mr. Stille services all the undergraduate physics courses at the University of Iowa with laboratory and demonstration equipment. Mr. Stille is also a member of PIRA, the Physics Instructional Resource Association, AAPT, the American Association of Physics Teachers, and APS.

For more than a decade Rodgers and Stille have also been conducting and enhancing a highly requested outreach program at the University of Iowa. In their collaborative efforts, Mr. Stille and Dr. Rodgers determine the topics to present to students and what hands on equipment will draw them in. Mr. Stille builds the rugged, hands-on equipment, and both Rodgers and Stille explain and present. These two captivate their audiences.

This program has been so successful that Hawk Eyes on Science had 44 events in 2013, and this does not include the other events these two take part in such as: special Saturday Science events, STEM seminars, Project Hope events, CLAS events (encouraging less represented groups to consider science degrees), Scout events, or the Café Scientifique. It has also drawn in professors and students from other departments.

It is no wonder that Dr. Rodgers received an award earlier this year from the University of Iowa for “College of Liberal Arts and Sciences Outstanding Outreach and Public Engagement.” In 2011 he received an award for encouraging people of a wide variety of backgrounds to pursue science careers.

So how do they make their program so successful? First and foremost they do so with a lot of dedication. But Rodgers and Stille have learned a few things over the past decade. One important key to it all is making sure the audience is involved with the equipment and demonstrations. Dr. Rodgers said that whatever equipment is brought “it must be something the audience is able to handle.” It is important to keep the audience involved. Dr. Rodgers also said that they always



Dr. Rodgers and the students he advises



Mr. Stille in his workshop with Neil deGrasse Tyson



Dr. Rodgers and Mr. Stille facilitating a Hawk Eyes on Science session



Dr. Rodgers and his proud father-in-law showing off his award

have an item for the audience to take with them, such as diffraction grating glasses.

Dr. Rodgers and Mr. Stille captivate the audience with strong neodymium magnets and copper showing Lenz's Law; they discuss generators and have a member of the audience generate electricity. They also provide some good advice about how to create a power generator if anyone from the audience ever gets stuck on a deserted island. Their electromagnetic repertoire also includes audience-led demonstrations of transmitters and receivers – sending signals with resonant coils.

Mr. Stille discusses the importance of pressure, and the air pressure around us. He has an audience member demonstrate some explosive pressure changes (destroying many cans and a ping pong ball).



The audience learns about light and dazzling spectra. With it all, Dr. Rodgers and Mr. Stille connect fundamental physics with common devices and applications in our society today.

The two are also involved in the relatively new Project HOPE (Healthcare, Occupations, Preparation, and Explorations), which is a joint venture between multiple departments at the University of Iowa. Project HOPE, engineered and managed by Dr. Saba Ali from the College of Education, reaches out to middle school students. Students are invited to the University of Iowa where they participate in hands-on experiences such as collecting and analyzing their own DNA and building (including soldering) a robot whose motion is controlled by optical sensors. The latter is led by Stille and Rodgers.

So if you happen to be near Iowa, or not, considers seeing just how this Dynamic Duo do outreach. The Hawk Eyes on Science website is: <http://faraday.physics.uiowa.edu/hes/>.

Contributed by: H.M. Doss



Dr. Rodgers and some hands-on experiences with electromagnetism.



Dr. Rodgers and some hands-on experiences with receivers and transmitters.



Dr. Rodgers interacting with the polar vortex

# Outreach News

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## Outreach in Planetariums

*Phantom of the Universe* is a new planetarium show that will showcase an exciting exploration of dark matter, from the Big Bang to its anticipated discovery at the Large Hadron Collider. The show reveals the first hints of its existence through the eyes of Fritz Zwicky, the scientist who coined the term "dark matter." Audiences will marvel at the astral choreography witnessed by Vera Rubin in the Andromeda galaxy, and plummet deep underground to see the most sensitive dark matter detector on Earth, housed in a former gold mine.

From there, our journey goes across space and time at the Large Hadron Collider at CERN, speeding alongside particles before they collide in visually stunning explosions of light and sound, while learning how scientists around the world are collaborating to track down the constituent of dark matter. The show will be offered to planetariums worldwide free of charge in early 2015.

With music composed by a well-known musician and narration by an acclaimed Academy-Award winning actress, *Phantom of the Universe* will showcase the creativity and directing prowess of Joao Pequeno of CERN's Media Lab and the writing and producing talents of award-winning filmmaker, Carey Ann Strelecki, PGA, WGA.

A talented team based in València produced the animated sequences of the show, giving life to the pixels on the dome. The dynamic live-action scenes were filmed by Jose Francisco Salgado of the Adler Planetarium. Some of the cosmology simulations were produced by Ralf Kaehler and Tom Abel of KIPAC at the SLAC lab.

The Executive Producers are Michael Barnett of Lawrence Berkeley National Lab, Kaushik De of the University of Texas, Arlington and UT Planetarium, Reinhard Schwienhorst of Michigan State University and Abrams Planetarium, Carmen Garcia of the University of Valencia, Markus Nordberg of CERN and George Smoot of the University of California, Berkeley.

*Contributed by: M. Barnett*

## Let FOEP Post Your Outreach Links

Does your outreach program have a website? We would love to post a link on the FOEP website. Please email your url to Beth Parks: [meparks@colgate.edu](mailto:meparks@colgate.edu), and include a list of the term(s) that should be used to describe the program. 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 cafes
- Other (please describe)

*Contributed by: B. Parks*

## Outreach News

NE  
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### March Meeting Contributed Talks

If you plan on attending the March Meeting, please consider giving more than your research talk. Talk about your outreach efforts as well. Submit outreach related abstracts to the Informal Education and Public Outreach session, 24.3. The best way to build community support for outreach activities is to let the community know the types of interesting and innovative outreach projects that you are all a part of. Recipients of the 2014 APS Outreach Mini-Grants will also be speaking in the session.

*Contributed by: R. Thompson*

## What Other Countries Are Doing: Web Sites Related to Science Awareness

info

*Contributed by: Y. Bruynseraede and I.K. Schuller*

The communication and explaining of physics to the public is important for the future of the nation and the world. It is also important to secure future funding for research activities. The following web sites describe outreach activities in foreign countries.

German Physical Society:

<http://berlin14.dpg-tagungen.de/programm/index.html>

Physics Education at the European Physics Society (EPS)

<http://education.epsdivisions.org/useful-links>

EPS Outreach Prizes :

<http://eps-hepp.web.cern.ch/eps-hepp/other-prize-awards.php>

European Science Open Forum: <http://www.esof.eu/>

The Foundation of Euroscience:

<http://www.esof.eu/index.php?section=19-euroscience>

European Physics Education Network:

<http://www.eupen.ugent.be/>

International Particle Physics Outreach Group:

<http://ippog.web.cern.ch/ippog/>

Europlanet Outreach : <http://www.europlanet-eu.org/outreach/>

Public awareness nuclear science:

<http://www.nupecc.org/pans/index.html>

Some examples of Public Outreach initiatives:

<http://www.kcl.ac.uk/artshums/depts/classics/about/outreach.aspx>

<http://www.fp7-hamlet.eu/index.php/hamlet/public-outreach>

Museum: <http://www.explora.cl/>

Two be sites started by Harry Kroto

<http://www.vega.org.uk/> and [www.geoset.fsu.edu](http://www.geoset.fsu.edu)



## Web Sites that Provide Information to Engage and Inform the Public

info

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

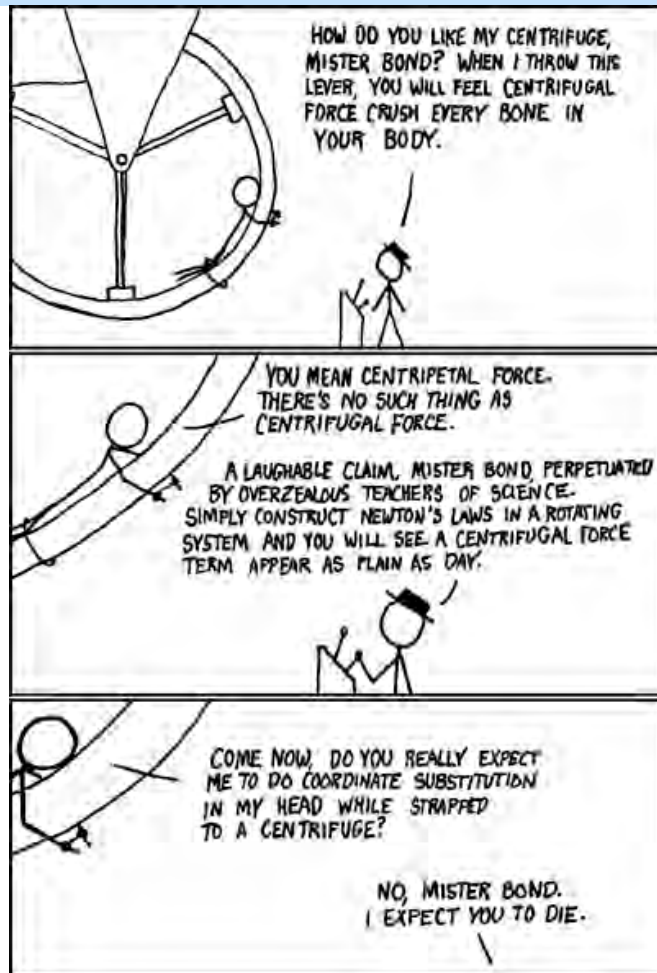
OSA's Optics for Kids website:  
Activities, Celebrities, Timelines, and more  
<http://www.optics4kids.org/home/>

International Year of Light 2015:  
Why light matters, Learn about light, Hands on  
involvement, and more  
<http://www.light2015.org/Home.html>

Florida State University Magnet Lab:  
Interactive Tutorials, Timelines, Pioneers, and more  
<http://www.magnet.fsu.edu/education/>

PhET simulations:  
Science simulations to explore various phenomena  
<http://phet.colorado.edu>

Nobel Prize Organization:  
Educational games, Documentaries, and More  
<http://www.nobelprize.org/educational/>



Cartoon credit: Randall Munroe, <http://xkcd.com/123/>

Contributed by: H.M. Doss

## Questions and Ideas



Next edition we will be publishing responses to these questions. Please submit your answer to [FOEPAPSnewsletter@gmail.com](mailto:FOEPAPSnewsletter@gmail.com) by 31 January 2015.

- 1) Which demonstration does your audience enjoy the best?
- 2) What is your best technique for engaging your audience?

### Want to get more involved?

Email someone on the executive committee. Contact info can be found 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](mailto:FOEPAPSnewsletter@gmail.com)

## 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."

<http://www.spsnational.org/programs/awards/white.htm>

### **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.

<http://spie.org/x36692.xml>

### **AAPT 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>

### **APS New York State Section Outreach Grants**

The purpose of this program is to support projects that increase public understanding and appreciation of physics particularly for K-12 students. The outreach committee will support projects up to a maximum of \$1,000 with some additional funds available for personal expenses.

<http://www.aps.org/units/nyss/outreach/index.cfm>

*Contributed by: B. Parks*

## Funding Spotlight

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**Outreach Mini-Grants!** The successful Outreach Mini Grant program will have more funds to distribute this year thanks to an NSF award. APS will award grants up to \$10,000 to projects designed to engage and excite the general public. In the past roughly five proposals have been funded annually but thanks to the extra funds provided from NSF we will be able to fund eight to ten proposals this year. Proposals will be due on December 14th. Visit the APS home page in early September for the official RFP.

*Contributed by: R. Thompson*



## Call for Fellows

### Fellowships:

APS Fellowship constitutes recognition by one's professional peers of exceptional contributions to the physics enterprise. Only APS members who are members of FOEP can be nominated for fellowship through FOEP. The deadline for Fellowship nominations is June 1, 2015.

Nomination is done entirely on-line. Complete instructions for the nomination are available at: <http://www.aps.org/programs/honors/fellowships/nominations.cfm>. The process consists of providing the nominee's contact and professional information and uploading nomination letters that document the accomplishments of the nominee and explain why he or she is deserving of recognition. Nominations are evaluated by the FOEP nomination committee, reviewed by the full APS Fellowship Committee, and finally approved by APS Council.

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 – take a moment to think about people who have an exceptional track record in this area. We strive to have a diverse group of nominees and encourage the nomination of members of all underrepresented groups. 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.

*Contributed by: D. Lesley-Pelecky*

Who

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## Dwight Nicholson Medal for Outreach

The Forum on Outreach and Engaging the Public has assumed responsibility for this prize. The 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: M. Barnett*

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# PHYSICS OUTREACH & ENGAGEMENT

## Executive Committee

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**CHAIR:** IVAN SCHULLER (01/13 - 12/14) UNIV OF CALIFORNIA - SAN DIEGO

**CHAIR ELECT:** MICHAEL BARNETT (01/14 - 12/15) LAWRENCE BERKELEY NATL LAB

**PAST CHAIR:** PAUL CHAIKIN (01/13 - 12/14) NEW YORK UNIVERSITY

**SECRETARY/TREASURER:** E DAHLBERG (01/12 - 12/14) UNIV OF MINN - MINNEAPOLIS

**MEMBER AT LARGE:** DIANDRA LESLIE-PELECKY (01/12 - 12/14)

**MEMBER AT LARGE:** BETH PARKS (01/12 - 12/14) COLGATE UNIVERSITY

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**MEMBER AT LARGE:** BRIAN SCHWARTZ (01/13 - 12/14) CUNY-GRADUATE CTR

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