

# PHYSICS OUTREACH & ENGAGEMENT

## Letter from the Chair

Dear FOEP Folks,

Do you receive encouragement or discouragement for your outreach work from your department/institution? This is one of the issues addressed by a short (but essential) survey, which you can complete online. We will soon send this survey to you, and we urge you to take five minutes to respond to the survey to help us do our job as best we can. The Forum on Outreach cannot succeed without knowing what you want.

The APS feels that Outreach is essential to the success of our field, now and in the future. In order to best serve you and a broader audience, the FOEP Executive Committee would like to know what types of activities you are engaged in, who you think your audience is, and related information. For the future support of physics, it is essential that physicists reach out to the broader communities, but such activities may or may not always be welcome by one's local department, hence the question about encouragement or discouragement.

FOEP members are the most important ingredient in the FOEP activities. We are a relatively new forum at APS, and are actively seeking new members. Please encourage your younger and more senior colleagues to join FOEP. They can join FOEP at no cost prior to renewing their APS membership by sending an email to [membership@aps.org](mailto:membership@aps.org) with their request to add FOEP to their membership.

In the news, a science documentary company has an NSF grant to produce an IMAX/Giant Screen film titled "Secrets of the Universe" with an accompanying educational outreach

*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.

VOL. 2 NO. 2 SEPTEMBER 2015

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

program. They say they wish to: “Inspire a society dedicated to solving the Secrets of the Universe and the challenges of tomorrow.” They have a website at: <http://bit.ly/SOTUonIGG>

Your participation in any of the activities listed below is extremely welcome, as is your proposing new activities. These are excellent contributions to our efforts. Please consider participating in any form you feel is appropriate.

FOEP has a number of ongoing activities, including:

- 1) Sessions at the March and April meetings.
- 2) A Physics Slam, which we hope to have at the next March meeting. We hope it will attract new ideas on how to explain Physics to non-expert audiences. Please watch out for notices and calls for participation.
- 3) We are sponsoring the Nicholson Medal. Soon you will receive a call for nominations. Your active contribution to this is important and would be greatly appreciated.
- 4) We are able to support nominations for new APS Fellows, and hope you will send us your nominations. More information will follow.

The current FOEP Executive Committee members are:

Past Chair: Ivan Schuller

Chair: Michael Barnett

Chair-Elect: Yvan Bruynseraede

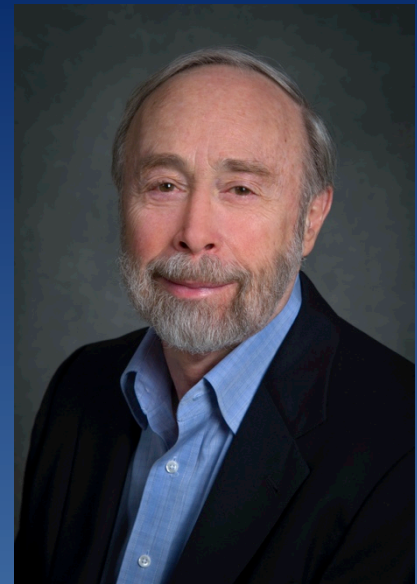
Secretary/Treasurer: E. Dan Dahlberg

Members at large: Philip (Bo) Hammer, Sidney Perkowitz, Jennifer Ross, Brian Schwartz, plus APS staff member Becky Thompson.

Assigned Council Representative: Gay Stewart

Editor of Newsletter: Heide Doss

Michael Barnett, 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.



## Dwight Nicholson Medal for Outreach

The Forum on Outreach and Engaging the Public is responsible for the selection of the recipient of the Dwight Nicholson Medal for Outreach. 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 excelled in one or more of the following areas:

1. Successfully stimulated the interest and involvement of the general public on the progress in physics.
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.
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*

Who

MPO

Dwight  
Nicholson  
Medal for  
Outreach

## 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, 2016.

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

MPO



## FOEP Demographics

**FOEP Total=** 1528 people      **% of APS=** 2.97%

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**Regular=** 539      **Regular Fellow=** 104      **Senior=** 48      **Senior Fellow=** 29

**Student=** 754      **Early Career=** 145

**Male=** 1,024 (67.02%)      **Female=** 405 (26.51%)      (99 people did not give gender)

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**59%** of our members are Student or Early Career. For APS as a whole it is **36%**.

**26.5%** of our members are female where for APS a whole it is about **10%**.

**10%** of our members are Fellows compared to APS as a whole it is **13%**.

## FOEP Survey

FOEP wants to find out more about its members and what we can do for you.

Please take the short (one page, 12 items, < 3 minute) online survey soon to appear at: <http://pdg.lbl.gov/foep-survey-2015/>

## FOEP Candidates 2016

Keep an eye out for an email on how to cast your votes!

### **Chair-Elect (vote for 1)**

Itai Cohen -- Cornell Univ.

Dirk Morr -- Univ. of Illinois at Chicago

### **Vice Chair (vote for 1)**

Larry Gladney -- Univ. of Pennsylvania

Daniel Steinberg -- Princeton Univ.

### **Members at Large (vote for 3)**

Alice Bean -- Univ. of Kansas

Jose de la Venta -- Colorado State Univ.

Heide Doss -- PLNU and SDSU

Amber Stuver -- Caltech

## FOEP Bylaws

The FOEP Executive Committee has voted to make changes to the bylaws in order to align them with current APS rules. These suggested changes will not take effect until APS reviews and approves them, and then an online vote of FOEP members is held.

## FOEP Membership

Hi FOEPers,

My name is Jenny Ross, and I am a member-at-large of FOEP.

As you may know, FOEP was established only a few years ago by physicists excited about Outreach and Engaging the Public with our science. We already have a healthy start to becoming an important and stable forum at APS, but, to ensure stability, *we need more members!*

To get more members, I will be running a membership drive! Here are some of the things we are going to do:

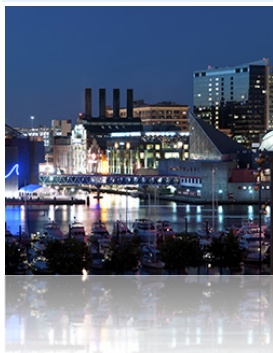
1. March Meeting and April Meeting Tabling. To increase encouragement, we will be giving people a list of all the free food events at the meeting. BUT, you can't get the list unless you sign up for FOEP. Also, get a badge sticker to show your support of FOEP! If you want to help with the tabling, great! Send me an email: [rossj@physics.umass.edu](mailto:rossj@physics.umass.edu)
2. Bring a friend to FOEP. Have a buddy who is active in outreach or public speaking about physics, who isn't with FOEP? Bring them to a session and to the table. Send them our newsletter (this). For every person you bring to FOEP, you will be entered into a raffle to win a **Pebble Time Smart Watch** (worth \$200).
3. We want to hear from you! Have a cool activity and a way to implement it? We want to see you give a talk at APS March or April meeting. These 10-minute talks *do not count* against your abstract submission for your science. It is an extra talk that you can give about your cool outreach. Look for our sorting session "**Outreach and Engaging the Public**" at both meetings (March and April). Your talks make APS meetings great! If we like your talk, we might call you for an interview to be profiled in our newsletter and on our website.

We hope to see you soon!

--Jenny Ross



## FOEP at APS Meetings – Future



APS March 2016 meeting will be held March 14-18 in Baltimore, Maryland.

FOEP is organizing an Invited Session with renowned specialists in bringing the message of outreach to the public. FOEP will also organize, for the first time, a Contributed Session and will sponsor a Physics Slam.

Done any outreach lately? Consider presenting your work at FOEP's March activities

- Submit an abstract for the contributed session on outreach and engaging the public.
- Sing, dance or act out your research? Perhaps just make everyone laugh about it? Consider trying out for the Physics Slam!



### The Great APS March Meeting Physics Slam

March Meeting attendees!!

Are you doing some awesome physics and have a talent for the dramatic or comedic or song or dance or lead guitar? Perhaps all of the above? AND, you want to share your science with Baltimore locals, sans PowerPoint or Prezi?

Well, FOEP has just the thing for you. We are planning the first ever – first annual?? – March Meeting Physics Slam.

The Slam will take place in two parts. First will be an audition before a panel of peers, for the ultimate in peer review. There will be no appeals to the editor!! Then, a subset of you most-talented ones will go on to the Main Event, likely at a local establishment that specializes in adult beverages, during which you will perform your six to eight minute Physics Slam before a fun loving – hopefully physics loving – audience of Charm City denizens.

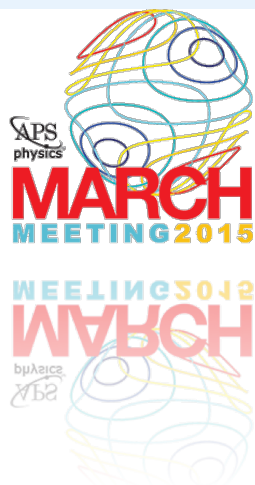
Stay tuned for more details on the APS March Meeting web site.



APS April 2016 meeting will be held April 16-19 in Salt lake City, Utah.

FOEP will again organize Invited and Contributed Sessions. Your participation on any of these activities is extremely welcome and an excellent contribution. Please consider participating at FOEP's April activities in any form you feel is appropriate.

## FOEP at APS Meetings – Past



### March 2015 Meeting

FOEP sponsored a session at March's meeting.

#### **Session J4: Invited Session: Forum on Outreach and Engaging the Public**

Tuesday, March 3, 2:30 p.m. - 5:30 p.m.

- The Physics Force presents the Physics Circus, Invited Speaker: E. Dan Dahlberg
- Quantum physics reimagined for the general public, Julien Bobroff
- Developing a Global Science and Math Education System Based on Real Astronomy Data, Invited Speaker: Carlton Pennypacker
- The Role of Outreach in NSF Proposals, Invited Speaker: Randal C. Ruchti
- Developing Broader Impacts Activities through Informal STEM Education Collaborations and Strategies, Invited Speaker: James Bell



### April 2015 Meeting

FOEP sponsored two sessions at April's meeting, including the communications workshop.

#### X8. APS & Public Engagement in Historical Perspective

Tuesday, April 14, 10:45 a.m. - 12:33 p.m.

- The American Physical Society and the Ethics of Cold War Science
- The Society's Involvement in the Defense of Human Rights
- History of the Forum on Physics & Society

#### Science: Becoming the Messenger Communications Workshop

Saturday, April 11, 1:00 p.m. - 6:00 p.m.



# Spotlights on Outreach and Engaging the Public

## ATLAS and the Montreux Jazz Festival

What do ATLAS, a major experiment on the Large Hadron Collider (LHC) at CERN, and the Montreux Jazz Festival have in common? Steve Goldfarb for one.

Dr. Goldfarb is a scientist that has worked on all aspects of particle physics, from detector construction and integration, database and software development, to physics analysis, and presentations to colleagues and the media. Currently he is working at CERN on the ATLAS experiment and is creator and organizer of a special event known as The Physics of Music and the Music of Physics at the Montreux Jazz Festival. This year marks its third annual event and it has been a big hit in engaging the public. I had more than a few questions for Dr. Goldfarb, which he graciously took time to answer.

*How much time did it take to put together the Montreux event? When did you first come up with the idea? What steps did you take to make it happen?*

“I have been attending the Montreux Jazz Festival since coming to CERN in 1988. I only recently discovered, however, that the Montreux Jazz Artists Foundation hosted workshops during the afternoons in the Petit Palais (next door to the concert venue). In Fall 2012, following publication of the famous Higgs boson discovery papers, I decided to approach them about holding an event on physics and music. They suggested a workshop and also performances by a couple of the CERN bands and we did just that.

For the first year (2013), I talked to some colleagues who work on outreach projects at CERN and was given the name of Mark Lewney, a man from the UK with a PhD in guitar acoustics who had a nice interactive presentation on the science behind music. Lily Asquith presented her sonification of ATLAS two-photon candidate events, and Piotr Traczyk provided entertainment with his CMS guitar and a brilliant explanation of the difficulty of finding the Higgs boson.”

In 2014 the event was held on a Saturday afternoon, there were about 200 attendees, and it was standing room only. This year there were about 100 attendees on a Thursday afternoon at 3 PM. There was a much larger media presence this year than previous years. In Steve Goldfarb’s words, “What is great is that we are reaching the general public. These are people who might never have heard of CERN or the physics of the LHC, otherwise.”

Information on the events for 2013, 2014, and 2015 can be found at the

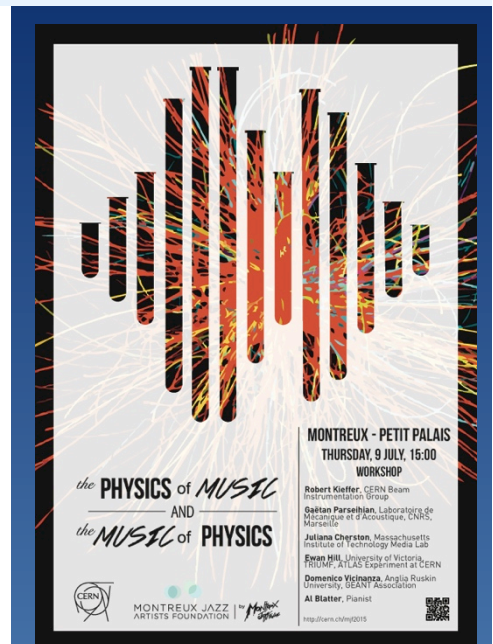


image of a poster advertising the event at the Montreux Jazz Festival



Steven Goldfarb

*“Science is fun and interesting because it is a fundamental part of human nature. So, it does not take much effort to spread the enthusiasm. We just have to do it, as much as we can.”*



following links:

- <http://mjf2013.web.cern.ch/mjf2013>
- <http://mjf2014.web.cern.ch/mjf2014>
- <http://mjf2015.web.cern.ch/mjf2015>

*“...I learned how to build and manage a team. The need for these skills are frequently underestimated in our field”*

The 2015 website is still in progress as of the writing of this article. They are currently processing video of the event that will be posted. One website that has a bit of video for the 2015 Montreux Jazz Festival is: <http://cds.cern.ch/record/2035059> .

*What is your sense on how much of an impact this event has had on engaging the public in science?*

“The impact of the event goes far beyond the local audience we reach in Montreux, although that remains an important part. In addition to the event, we do a number of interviews and create written material, images, and video for the media and social media. This year, we were featured on RTS, Reuters, AP, BBC, WRS, and probably a few other acronyms. During the actual event, I slip in about 15 minutes of introduction, which educates the audience on the primary goals and achievements of the LHC. I think that is very important; and the message gets re-transmitted via the audience and other communication channels. Equally important to informing the audience, however, is that the event gives us a chance to engage the audience. We take time to have discussions with them after the show and I highly encourage that. The participants are treated like stars (which they truly are) and they have a chance to share their enthusiasm with the public.

I think it is as important to convey the importance of science and of fundamental research as it is to give details on the physics, so we all spend a significant time on that. Science is fun and interesting because it is a fundamental part of human nature. So, it does not take much effort to spread the enthusiasm. We just have to do it, as much as we can.

We promote the physics of all of the experiments [at CERN] and I am a personal fan of them all, as well.”

*How has working on every aspect of a big project helped you in being able to reach out to the public and engage them on what scientists do?*

“It is always easiest talking about things you have experienced. I was truly lucky to come in as a first year graduate student as LEP (Large Electron-Positron collider) was being developed. I had the opportunity to help construct, test, integrate, and write software for components of the L3 detector on LEP. I was fortunate again to be involved in ATLAS from the early stages, although I focused on my strength, which was the development of software, database, and analysis tools.

In addition to the hands-on aspects, it has also become increasingly important for scientists on large international projects to develop management skills. Early on, I found myself coordinating the development of some of the software, and inherited an interesting set of human challenges, as well the technical ones. Fortunately, the expertise of the developers came through and, with everyone's patience, I learned how to build and manage a team. The need for these skills are frequently underestimated in our field.

Concerning translating this into engaging the public, I would say the communication skills we learn in large international collaborations help. But, I would say the reverse is probably more relevant. Learning how to effectively engage the public has been very important for developing skills for communicating within the collaboration. It is also invaluable for any scientist to develop their own understanding of the relevance of

their work and how it fits into the big picture. For that reason, I highly recommend that all researchers (especially young ones) get involved in outreach. Communication is an invaluable tool.”

*What types of collaborative tools have you helped develop? How have these tools assisted in reaching out to the general population?*

I was involved early on in the testing and development of tools like lecture archival, application sharing, and videoconferencing. I contributed primarily as a tester and a vociferous user (one who took the time to try tools and provide feedback). I owe my interest and participation to Prof. Homer Neal, who created the ATLAS Collaboratory Project at the University of Michigan. He foresaw the need to facilitate the active participation of all collaboration members, regardless of location.

In 2005, I chaired an LHC Computing Grid Requirements and Technical Assessment (RTAG) group to determine the readiness of the LHC, in terms of collaborative tools. I would say we gave CERN a very poor grade, at the time, but we then developed a plan for large-scale deployment of tools throughout the lab. I am very happy to say that today CERN has a very pro-active team at IT working on these issues and has installed systems everywhere. Essentially all key meetings are held via videoconference and the system works very well. I would also like to mention the very important work of Prof. Harvey Newman of CalTech, who spearheaded the development of IP-based videoconferencing, paving the way for this success.

In 2008, following the startup of the LHC, I was inspired by the fact that the control room had been equipped with cameras and sound systems for sending webcasts to a large distributed audience. This was used for LHC Startup and LHC First Physics to reach millions around the world. The day I saw Fabiola Gianotti (ATLAS Spokesperson at the time) speaking to the cameras, I decided we needed to do this regularly and in an interactive manner. So, I added headsets, and a videoconferencing system, and launched a program called ATLAS Virtual Visits. Today we host virtual visits with classrooms (and other events) around the globe. We have had hundreds of these visits in the past few years and, in 2014, reached all 7 continents (yes, including Antarctica). This success has not only allowed us to reach a larger audience, but it has allowed people from places who would not usually be able to make the trip to CERN to have interactive access to CERN researchers. It is also an excellent means to train physicists how to do outreach.

I also helped to launch a regular communication series on CERN physics using Google Hangouts called “Hangout with CERN”, together with Achintya Rao (CMS) and Kate Kahle (CERN DG COM). We ran the show for about a year, with quite a bit of success, but have stopped to re-assess. It takes a lot of time and effort to do these things, so success does not always mean we can keep it up without more support.”

*“Learning how to effectively engage the public has been very important for developing skills for communicating within the collaboration.”*

*“I highly recommend that all researchers (especially young ones) get involved in outreach. Communication is an invaluable tool.”*

*“We ran the show [Hangout with CERN] for about a year, with quite a bit of success, but have stopped to re-assess. It takes a lot of time and effort to do these things, so success does not always mean we can keep it up without more support.”*

*“A band, like an experiment, is a collaboration of people who all depend on each other and who benefit from each other’s success.”*

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*For the past 21 years you've been in a blues band called the Canettes. How does music connect with science for you? Do you find the creativity in music different than the creativity as a scientist?*

“My music used to be separate from my physics. That was true right up to the point when I wrote The ATLAS Boogie and performed on the ATLAS CD Resonance. I think the primary influence being a performer has had on me has been on my ability to speak in public. I have learned how to read crowds and how to interact with them. I love that challenge. When I perform or when I talk about science, my goal is to make everyone relaxed, at ease, enjoying, and having a good time. I think that is what this is about, in any case. Life is very short and we should enjoy it. If we happen to learn a thing or two along the way, so much the better.”

*How long have you been in a band? How else has being in a band influenced your outreach efforts?*

“The band first formed for the CERN 40th anniversary, 21 years ago. And we are only getting better. In addition to its influence in how I do communication, I should also mention its effect on my perception of management. A band, like an experiment, is a collaboration of people who all depend on each other and who benefit from each other's success. Motivation to do well is never an issue, but coming to agreement on various items, like set lists, new songs, what to play when, how to play it, etc. is not always easy. Whenever possible, we try to reach consensus. It requires defining priorities and making compromises, but it is really the key to success, and is why we have lasted so long as a band. I have found all of these lessons valuable in my leadership positions in physics.

Music, in general, has also been a foot in the door for science communication to various new audiences. We have invited several very big named bands to visit ATLAS and that helps get the word out to their young audiences that science is important and fun. We can never stop trying to find new channels to communicate that message.”

*Have any tips, suggestions, words of wisdom (and so forth) to give those who are trying to do outreach efforts?*

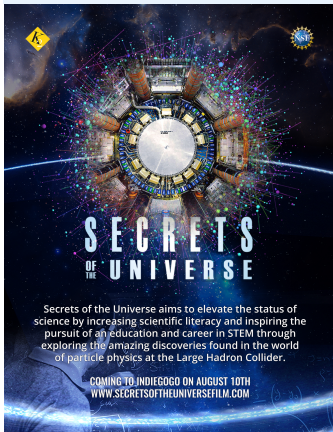
“Easy. Do it! It is both fun and essential for becoming a good scientist. You will certainly have challenges at first (I've been attacked by a few 4th graders with tough questions and it is not easy!), but you will learn and improve. Just jump in the waters and swim.

We have seen an impressive and important change over the last several years in the recognition of outreach as a key component to scientific research. Major physics conferences, such as ICHEP, APS, EPS, CHEP, now all host parallel sessions for talks about outreach. Several also have an occasional plenary session. Communication is being recognised as an essential component to any experiment, on par with detector sub-systems, electronics, trigger, computing, and physics analysis. Large collaborations, such as ATLAS, treat Outreach at the Project level. We are not yet represented on the Executive Board, but I believe that is only a matter of time.

Although outreach typically has a very modest budget, every member of the collaboration is a potential contributor. So, we focus our efforts on developing material and platforms to support the efforts of the collaboration. Programs like Virtual Visits and Masterclasses are examples of how we can use our modest resources to reach a world-wide audience in an effective manner. We have an important message to bring to the world: "science is an essential component of human nature," and we should stop at nothing to communicate that message to the world.”

*Contributed by H.M. Doss*

## Outreach News



There's a new IMAX film coming out called "*Secrets of the Universe*." The film, based on experiments at the Large Hadron Collider (LHC), highlights the current excitement in the field of particle physics, and how recent experiments help us understand our universe.

<http://secretsoftheuniversefilm.com>

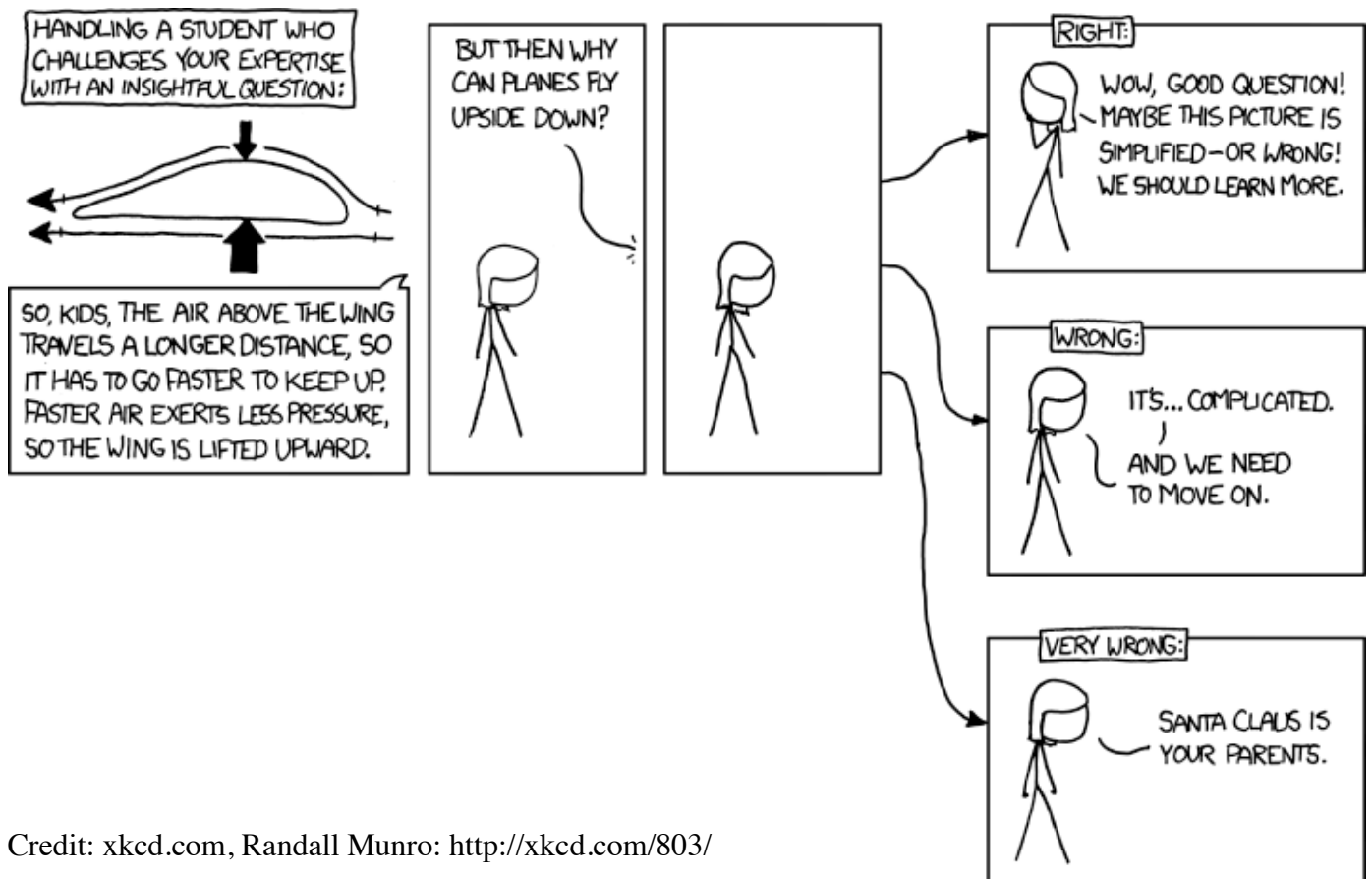
The film's facebook page:

<https://www.facebook.com/secretsoftheuniversefilm>



Universal Foam 2.0: From Cappuccino to the Cosmos  
by Sidney Perkowitz (Author) <http://tinyurl.com/qcl4bcx>

A video based on the book: *Bubbles That Can Change the World*,  
<http://tinyurl.com/qxz4mtj>



Credit: xkcd.com, Randall Munro: <http://xkcd.com/803/>

## Web Sites that Engage and Inform the Public

info

The ATLAS experiment at CERN has approached outreach and engaging the public in many different ways.

This link is to their home page: <http://atlas.ch>

For grades 2-8 educational outreach: <http://www.quarked.org/about/outreach.html>

Or their student/teacher link: <http://www.atlas.ch/students-teachers.html>

For general public outreach: <https://atlasphysathome.web.cern.ch>

The Quantum around You (see *Spotlight* article above)

<https://www.youtube.com/watch?v=tnfur3fqklc>

Exploratorium – A science museum in San Francisco, CA that has local and global outreach projects

<http://www.exploratorium.edu>

IOP Physics.org

<http://www.physics.org>

Minute Physics

<https://www.youtube.com/playlist?list=PL908547EAA7E4AE74>

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/>



## 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](mailto: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*

## Fall and Physics



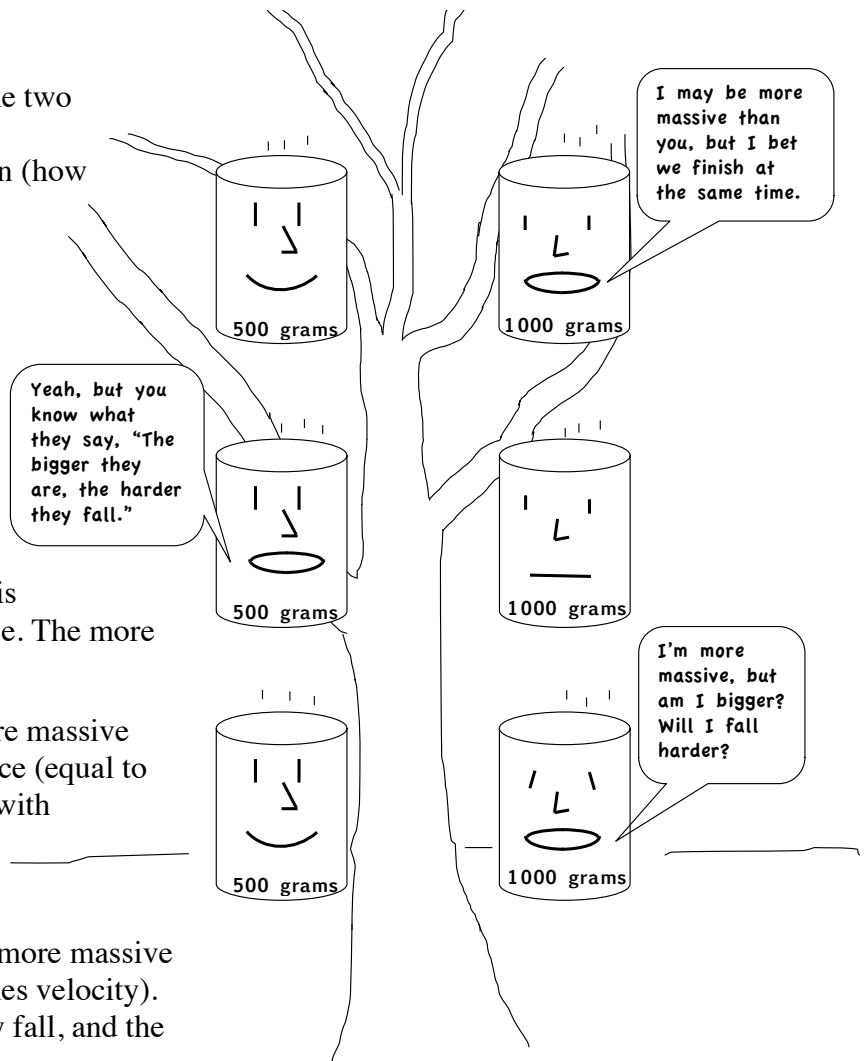
### Falling Objects

**Similarities:** At any instant while falling the two masses have the same size, shape, volume, direction of motion, speed, and acceleration (how speed and direction change). They were dropped from the same place, at the same time.

**Differences:** Density is mass per volume. The object with more mass must be denser because there is more material (matter) in the same volume.

**Weight:** On Earth weight is equal to the mass of the object multiplied by the acceleration due to Earth's gravity, which is approximately constant near Earth's surface. The more massive object weighs more.

**More massive and harder to stop:** The more massive object will hit the ground with a bigger force (equal to its weight). The ground will "hit" it back with an equal and opposite force to stop it. The more massive object has more energy, which is mostly transferred to the surroundings when it hits the ground. The more massive object also has more momentum (mass times velocity). The more massive they are, the harder they fall, and the harder the ground hits them back!



**Finish**

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## 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](mailto:FOEPAPSnewsletter@gmail.com)

## Funding Information



### **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 - 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>

### **OSA Outreach Grants**

International Year of Light Youth Education Outreach Grant (up to \$500). International Year of Light activities including Day of Optics, classroom demonstrations, etc. Eligibility: two per year per chapter/section

[http://www.osa.org/en-us/membership\\_education/grants\\_recognitions\\_special\\_services/grants\\_fellowships/activity\\_grant/](http://www.osa.org/en-us/membership_education/grants_recognitions_special_services/grants_fellowships/activity_grant/)

### **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>

### **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](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](http://www.eps.org/?page=support_grants)

Many institutions have their own internal outreach funding programs.

*Contributed by: H.M. Doss*



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# PHYSICS OUTREACH & ENGAGEMENT

## Executive Committee

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

**CHAIR-ELECT:** YVAN BRUYNSERAEDE (01/15 - 12/15) KATHOLIEKE UNIV LEUVEN

**PAST CHAIR:** IVAN SCHULLER (01/15 - 12/15) UNIV OF CALIFORNIA - SAN DIEGO

**VICE CHAIR: OPEN**

**SECRETARY/TREASURER:** E. DAHLBERG (01/15 - 12/18) UNIV OF MINN - MINNEAPOLIS

**MEMBER-AT-LARGE:** JENNIFER ROSS (01/15 - 12/16) UNIV. OF MASS. - AMHERST

**MEMBER-AT-LARGE:** PHILIP HAMMER (01/15 - 12/16) AMERICAN INST. OF PHYS. AIP

**MEMBER AT LARGE:** SIDNEY PERKOWITZ (01/13 - 12/15) EMORY UNIVERSITY

**MEMBER AT LARGE:** BRIAN SCHWARTZ (01/13 - 12/15) CUNY-GRADUATE CTR

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Forum on Outreach and  
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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](mailto:FOEPAPSnewsletter@gmail.com)*

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