At its November meeting, APS Council approved five new awards of varying types. All of them will be calling for nominations in early 2011, in the expectation of presenting the first round of awards later in the year or early in 2012. Among the new awards is the Stanley Corson Award in Fluid Dynamics, named for a distinguished professor at Johns Hopkins who was closely associated with the establishment of the Division of Fluid Dynamics and himself won the Fluid Dynamics Prize in 1983. The Corson Award will have a stipend of $5000, and is intended as a mid-career award to complement the Fluid Dynamics Prize, which usually goes to a senior researcher. It carries a stipend of $4000.

Council also approved the Henry Primakoff Award for Early Career Particle Physics, proposed by the Division of Particles and Fields. It will recognize outstanding research in elementary-particle physics performed by a physicist who has held the PhD for no more than 7 years, plus any career breaks. Supported by a fund of the University of Pennsylvania physics department in memory of Henry Primakoff, who was a professor there for many years until his untimely death, the award will have a stipend of $1500.

Also proposed by DPF and approved by Council is a new dissertation award in theoretical particle physics, which will complement the Tanaka Award, given annually for the best dissertation in experimental particle physics. Finally, Council approved an award to be administered by the Committee on Education, that will recognize programmatic excellence in undergraduate physics education. Each such department or program will be recognized for a three-year term, and approximately three departments or programs per year will be selected. The award will consist of a plaque, and will be noted on the APS website. It will provide additional recognition for education beyond the existing Award for Excellence in Physics Education.

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National Science Board Rejects Funding for Underground Lab

By Michael Lucibella

In an unexpected move, the National Science Foundation in early December opted not to fund further design work on a massive laboratory planned for an abandoned mine in South Dakota. The Deep Underground Science and Engineering Laboratory (DUSEL) would lose millions of dollars to cover budget overages in the lab design process, possibly leaving their partner, the Department of Energy, as the project's sole financier.

Lab planners, as well as the governor of South Dakota, said that despite this early setback they intend to continue work to develop the $875 million facility, and are currently weighing their options. In September of 2009, the Committee on Programs and Plans of the NSF's oversight body, the National Science Board, authorized $29 million to draw up a preliminary design of the lab. However the costs soon overran the allotted budget and the lab's designers submitted a follow-up request for an additional $19 million for spring 2011, with a further $10 million request likely sometime next year. These "bridge" requests were turned down by the National Science Board. "It was a bit of a surprise," said Bob Sanders, spokesperson for the project at the University of California, Berkeley. "It was just supposed to be a continuation of funding." In addition to the funding, the National Science Board balked at its proposed role in the project. Under the plan, the NSF would have been part of a stewardship program to run the lab, along with the Department of Energy, the University of California, and the South Dakota School of Mines and Technology, ultimately turning the current Sanford Underground Science and Engineering Laboratory into the full-fledged DUSEL. "That model was not appropriate for the role and mission of the NSF," said Ray Bowen, Chairman of the National Science Board, adding that the NSF does not typically run large science laboratories, a role he said was more in line with the work of the Department of Energy.

Council Establishes Forum on Outreach and Engaging the Public

On November 20, APS Council voted to create a new Forum on Outreach and Engaging the Public (FOEP), and adopted the proposed draft of its by-laws.

The APS Committee on Informing the Public (CIP) had spearheaded the drive to create the new forum. In order to bring a petition to Council, at least 200 APS member signatures are required; the petition drive quickly obtained more than 600. The organizers say that the forum is aimed at building a stronger community of people involved with raising the visibility of physics and science to the general public. "We wanted to create an opportunity for physicists who are interested in outreach and engagement and the public to come together," said Philip Hammer of the American Institute of Physics. He is a member of the CIP as well as of the forum's organizing committee.

In the coming months, the organizers will concentrate on getting the word out to the APS membership as part of a campaign to recruit members of the forum. In addition the organizing committee will start formalizing the leadership of the new forum. The forum will enable physicists interested in interacting with the general public to network and share the best approaches and techniques. The forum will publish a newsletter and maintain an active online presence, and will begin to organize sessions at APS meetings. Ultimately the organizers hope that this forum will help raise the quality of outreach efforts.

"The forum provides a venue for people to congregate, provide best practice manuals...and disseminate things that work so people don't have to repeat the mistakes that other people have made," said CIP committee chair Dan Dahlberg of the University of Minnesota in Minneapolis, "The need for physics to be more visible is important. The visibility has impact on funding and just the general need to educate the public on science."

Other members of the forum's organizing committee have also said that they hope the forum will focus on disseminating materials on traditional outreach efforts such as physics demonstrations, lectures, and working with schools. However they say it will also incorporate newer techniques such as working with new media such as blogs, twitter and social network sites as well as interacting with lawmakers, authors, museums, television and movie producers and even getting the public involved with citizen science.

The name "Outreach and Engaging the Public" was chosen by-laws.

COUNCIL continued on page 4

Topical Group Organizers Meet

In December at APS headquarters in College Park, the organizing committee for the proposed new Topical Group on the Physics of Climate held a productive face-to-face meeting. It is expected that their proposal will be ready for consideration at the next APS Council meeting in April. Seated in the photo are (l to r): Judith Lisan, Roger Cohen, Brad Marsden, and Warren Warren. Standing are (l to r): Pierre Meystre, Bob Austin, and the Chair of the committee, Jerry Friedman, who expressed satisfaction with the meeting, commenting that "we have made excellent progress in establishing a new topical group." Committee member James Brassier was not present but participated by teleconference.
January 10, 1910: Death of Wallace Sabine, pioneer of architectural acoustics

Composers have always recognized the importance of the acoustics of a given performance space, and many tailored the music they composed to maximize the effect. For instance, Grand Tourists fared well in medieval cathedrals, known for their long reverberation times; ditto for organ music, such as Bach’s “Toccata in D Minor” in contrast to Mozart and Beethoven’s music to be played in highly furnished chambers, for smaller, intimate audiences. Such pieces lose their clarity when played in highly reverberant spaces.

But no one really thought about how to design a concert hall or opera house to achieve optimal acoustics until the end of the 19th century. It was through trial and error, with little acoustical theory, to provide much of a framework to centuries of experimentation. The father of modern architectural acoustics is an American physicist named Wallace Clement Sabine. Born in 1879 in Portland, Maine, Sabine graduated from Brown University in 1898 and went on to pursue graduate study in France. In 1900, he was appointed to the newly created position of AIP Director, and in 1903, he was elected to the physical society, Philadelphia, PA, 1907-1908. Sabin concluded that the Fogg Lecture Hall’s reverberation time was too short—2.5 seconds—a problem that led him to recommend the addition of a face shield for the audience to improve the acoustics. Sabine did not have any particular experience with sound—indeed he didn’t even hold a PhD, although he was an avid amateur researcher and took the challenge with equal enthusiasm, to improve the room’s acoustics. He chose to characterize sound in a room as a diffuse body of energy, rather than as waves. With this approach, Sabine formulated the “sabin,” a quantitative tool in architectural acoustics to determine whether a room is suitable for musical performance. The sabin is still the critical factor for gauging a space’s acoustical quality in 2010. However, the criticality of the space’s acoustical quality: RT 60 = 0.49 V/SA, where V is the room volume (expressed in cubic feet) and SA is the total absorption (expressed in square feet), where A is the average absorption area of the floor of the room, and V is the surface area. The modern unit of sound absorption, the sabin, is named after him, and is considered the most important quantitative tool in architectural acoustics.

Sabine concluded that the Fogg Lecture Hall’s reverberation time was too short—a long-speak word would remain audible for 5.5 seconds, as opposed to the optimal reverberation time of 2.25 seconds. So there was too much resonance and echo. He solved the problem by outfitting the space with sound-absorbing materials to reduce the “echo effect.”

His success cemented his reputation as the “father of architectural acoustics,” and by the 1930s, the Fogg Hall was the last vestige of the “scotch box” configuration, which he had helped define in a paper titled “The Box.” Sabine also designed the acoustics for the New York City Opera, the Liedertafel, and many other halls throughout the world. His work laid the foundation for modern architectural acoustics, and his contributions to the field have been recognized with numerous awards and honors, including the National Medal of Science, the AIA Gold Medal, and the IEEE Centennial Medal. Sabine is remembered not only for his contributions to the field of architectural acoustics, but also for his role as a leader and educator. He was a founding member of the American Institute of Acoustics, and he played a key role in the development of the field.

In 1913, Sabine began teaching at the Massachusetts Institute of Technology, and he served as the head of the Department of Physics until his death in 1919. During his career, Sabine published over 150 papers and three books, and he was a member of the National Academy of Sciences. Sabine was also a member of the American Association for the Advancement of Science, and he served as the president of the American Physical Society. He was a founding member of the American Institute of Acoustics, and he served as its president from 1934 to 1936. His work and legacy continue to inspire and influence the field of architectural acoustics today.

References

New President Stresses Research Funding, International Engagement as Key Concerns

Barry Barish, Linde Professor of Physics Emeritus at Caltech, assumed the APS presidency on January 1, 2011. In the following interview with APS News, he discusses his priorities for the Society during his presidential year.

Q: What do you see as the most pressing issues facing the physics community right now?
A: This is always a hard question to answer. It is always near the top of the list, but the economic downturn and the election of a new Congress with a very different composition may give special emphasis to several areas during the coming year.

1. The construction of the addition to the APS Ridge facility. This addition is badly needed and is a result of our own successful, resulting in continued and steady growth of our journals. We have a very attractive building design to augment the present facility and we are hopeful that we will receive final building approvals soon. Working with our architects, our contractors and our consultant, we should begin the actual building in the coming months.

2. Evolving the APS to better fill the needs of our diverse membership. The first and most obvious need is to recognize the fact that our membership has a growing and large international component. Second, we need to develop international representation on our committees, make our scientific research accessible through modern communication technologies, and help secure our journals, which have such a large number of submissions from outside the US, are fully responsive to the make-up of these publications and expanding our articles around the world.

3. The other big issue involving publishing is the movement toward “open access.” We must become proactive in developing an open access concept for APS journals, and that the CFDA role is not worthless. We are the leaders of this movement.

Q: How do you think the science community will fare in the coming months? Are there any areas where you think APS programs could be enhanced?
A: I haven’t heard complaints about the NSF role.” Our science is great. It’s important, and we need to think about ways to make more acceptable models for its implementation. The APS has a large component of students and young researchers, and they are not well represented in our policy committees, at our meetings, etc. I would like to see our members in the future that we can both facilitate better representation in these society activities and we should try to understand other areas. There are issues for this important component of our membership.

Q: What do you see as the society’s role in public policy?
A: The APS can and does play an important role in influencing policy decisions on such issues. It is important to realize that our government has few elected scientists or technically knowledgeable members. Therefore, it is incumbent on the science community to help inform the government on policy issues that involve science and technology. Our RW and POPA committees, and more generally, our Washington DC office play important roles in this area, and that it is interesting in understanding how we might or should involve the mission of the Washington Office, both of these, and how to deal with the needs for having an informed government.

It is time we see as the APS continued on page 7

Funding continued from page 1

Energy: “There’s never any question of the science being conducted.”

Bowen noted that the job of his office is to ensure that the science undertaken outside the NSF’s traditional role in science, but he added that the NSF was not opposed to working with the project should another more acceptable model for its involvement be proposed. “We think the science is great. It's important, it's exciting, but this would be a way to fix that model to be more consistent with the NSF role.”

The Ridge facility would dramatically increase the underground laboratory space in the United States. The almost two-mile deep mine is the perfect location to shield sensitive detectors from cosmic rays and other radiation.

The massive underground laboratory will use the defunct Homestead gold mine in Lead, South Dakota. Before it closed, Homestead was the nation’s most profitable, and most dangerous, gold mine in the Western Hemisphere. As deep as 8,000 feet in some places, the mine shafts would be ideal for proposed dark matter detectors, and for experiments looking for neutrino oscillations and neutrino-less double-beta decay, as well as for biological, engineering and geological experiments.

If You Can Make It Here...

The LaserFest celebration of the 50th anniversary of the first working laser had one last trick up its sleeve as 2010 came to a close. Recognition of the four founding partners of Laserfest, including APS, took one of the jumbotron slots strategically located in Times Square. Throughout late November and December, this laser played the curiosity of the hundreds of thousands of visitors to that storied New York destination, perhaps intriguing some of them enough to visit the LaserFest website whose URL, appeared at the bottom of the screen.

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Early Use of Scotch Tape Cited

The adhesive tape technique used by the recent Physics No- Belle laureates Andre Geim and Konstantin Novoselov has at least one precedent, although I suspect there could be more than one. In 1966-67 I was a physics student at the University of North Dakota, Grand Forks, working in the lab of Professor Henn Soonpaa (formerly a research scientist at Honeywell). We were measuring how the resistivity of thin films of Bi,Te,S crystals might be affected by its thickness. Professor Soonpaa taught me the technique of peeling off layers of the film with scotch tape to obtain extremely thin samples. Eventually, the measured thickness of the thin single-crystal atom thick. My recollection of that time is that very few people, if any, believe the film was that thin.


Enforcement Necessary to Prevent Nuclear Spread

The Back Page on tactical nuclear weapons by Irving L. erch expresses how APS News (October, 2010) expresses the misguided conviction that nuclear deterrence is a priori bad and should be done away with, the sooner the better. It is particularly outrageous that he writes that “it is safe to have been relocated from the war zones to [our] homeland.” He seems to argue that it is preferable that the US should not have any nuclear weaponry to deter it (unless we are sure with that no nuclear state will consider it). He then threatened use of such [nuclear] weapons against states like Iran...[a situation where] we should be considering reductions or better yet a total ban....

Tactical Nukes? What Tactical Nukes?

Irving Lerch’s Back Page in the October 2010 APS News is completely wrong. There is no cover-up regarding tactical nuclear weapons because the US has none. In 1991 President Bush (41) and Chairman Gorbachev agreed to mutually dismantle tactical, or battlefield, nuclear forces. The US promptly removed its tacti- cal nukes. Since I retired from Los Alamos National Laboratory, I no longer have access to intelligence information on whether the Russians have too. The US enduring stockpile consists of two land-based missile systems (ICBMs), two subma- rine launched ballistic missiles (SLBMs), two aerial bombs, and a weapon deployed on several cruise missiles. All are under control of STRATCOM, Strategic Command headquartered at Omaha. The army and surface navy including marines do not have any nuclear weapons. During the 1991 Gulf War, there were six nuclear-weapon-armed aircraft carrying the waters off Iraq; during the 2003 Gulf War, there were aircraft carriers in the theater but they were not armed with nuclear weapons.

John L. Richter
Albuquerque, NM

APS Should Stick to Scientific Matters

We read with some interest the story headlined “APS Responds to Member Resignation over Scott Change” (APS News, November 2010). It seems to us that the real ques- tion is not whether global warming ideology is a scam or not. The real question is what type of organization does APS want to be? Since joining APS in the 1960’s we have noted a constant drift from a sci- entific agenda toward a socially relevant agenda. We believe that APS should limit its activities and publications to scientific matters and avoid political and societal is- sues altogether. We are not saying that scientists should not be con- cerned with politics and social is- sues. They should. It is their duty to do so. But they speak for themselves, according to the Hal Lewis’s resignation letter, on their own beliefs. APS is on a slippery slope.

On politics and societal is- sues creep into its agenda scientifi- c integrity will suffer at the hands of political correctness and demu- goguery. As a trivial example, in APS’s response the following oc- curs: “... APS notes that virtually all reputable scientists agree with the following observation: ‘The science truth is not determined by a majority vote. Words such as conservative or incomprehensible do not play a role. The annals of physics are rife with instances in which the majority of scientists agreed on something that turned out to be wrong. (Light propagates through the æther, and the atom is the smallest unit of matter.)’...”

We feel that APS should limit its activities to establishing facts and finding the truth by scientific means. Individuals or groups of individuals within the APS mem- bership have every right to express political or policy views as they may see fit. But identification of those indi- viduals who espouse a particular point of view should be explicitly avoided. The APS Council, and POPA in particular, should not attempt to speak for the member- ship as a whole on political policy matters. As a start to move toward openness and transparency, the APS should publish this newspaper a list of individuals who formulated and wrote the current climate policy statement(s). It is their statement and not necessarily the statements of the APS mem- bership. The APS should also pub- lish on the web the 1600 (or so) members’ commentary statements on the climate issue solicited this past year. Then, we and the public as a whole can begin to see the diversity and divergence of views, knowledge, and expertise amongst physicists in the US.

Thomas Wolfram,
San Clemente, CA

J. Roland Gonano
Clarksbury, MD

S. Werner,
Gainesburg, MD

J. Roland Gonano
Clarksbury, MD

Ed. Note: Not only did Fox News not clarify her position, they have been unwilling to discuss any attempt to correct the facts, despite much effort by APS to do so. And not only did they air Ingraham’s report (or “commentary”), they also simultaneously displayed a picture of Curtis Callan, thereby “compounding the error and as- suming at least some complicity in promulgating erroneous information.

Resignation Story not Balanced

I was disappointed to read your November APS News headlining the accompanying piece on Fox News—both of which read more like partisan drivel than news media. As members of a premiere scientific society, had APS News been interested in presenting its readers (most of whom are very educated scien- tists with a balanced view of the world) Lewin’s resignation letter along with President Callan’s response and let the reader make up his or her own mind. We could not miss the irony that the APS News response to a letter detailing how APS has stifled debate was to present only half of the story.

By Michael Lucibella

Careful when asking physicists for directions...

COUNCIL continued from page 1

by the organizing committee to reflect this two-way interaction was clearly stated.

“Outreach is educating, enter- taining, and increasing the inter- est of the public in physics and science that is not in the normal setting, that’s not in the classroom, that’s not what we normal- ly do,” Dahlberg said.

“Engagement is the implies two-way interaction,” Hammers said. “Not just enlightening the public, but to get non-physicists involved with physics.”

The organizers said also that they are looking forward to repeating the program in other forums such as the Forum on Education and the Forum on Physics and Society.

“There should be cross-fertil- ization, this forum should not be independent of everybody else,” Dahlberg said. “It should be a synergistic relationship between these groups.”

Ed. Note: Hal Lewis’s letter is quite long and, as our story not- ed, available on the internet. We quoted from the letter in our story, and endeavored to present Lewis’s main points as well as the APS re- buttal.

Peter Friedman
Dartmouth, MA

Ed. Note: Hal Lewis’s letter is quite long and, as our story not- ed, available on the internet. We quoted from the letter in our story, and endeavored to present Lewis’s main points as well as the APS rebuttal.

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**Physics Departments Closing: What Can We Do?**

The recent closures of a number of physics departments, as documented in a recent APS News article (December 2010), is an alarm that should cause physics departments to take note. Given significant budgetary woes, administrations are under a great deal of pressure to cut costs. Physics departments at smaller colleges and universities can seem like ripe targets, due to small numbers of majors, and consequently, typically a high-cost-to-student ratio.

**What can we do?**

As a first step, we recommend reading the Strategic Programs for Innovation in Undergraduate Physics (SPI-UP) report, available at www.aps.org/programs/education/undergrad/faculty/support.cfm. This report, written by the multi-society National Task Force on Undergraduate Physics, outlines a number of steps a physics department can take to invigorate its undergraduate program and increase the number of majors it graduates. Major recommendations of the report include:

- Adopt interactive, student-centered introductory physics curricula like SCALE-UP, Modeling, Tutorials in Physics, or Workshop-Physics. Physics major retention rates have substantially increased for departments that use these curricula.
- Pay attention to your students: have your best instructors advising and mentoring your majors, teaching introductory sequence, and advising your Society of Physics Students chapter.

Other resources to help recruit and retain physics majors are available at www.aps.org/programs/education/undergrad/faculty

**PhysTEC Conference Coming in May**

The physics Teacher Education Coalition (PhysTEC) Conference will be held on May 23-24, 2011, with the theme of Sustainability for Teacher Education Programs. The PhysTEC Conference is the nation’s largest meeting dedicated to the subject of physics education, and features workshops, panel discussions, and presentations by national leaders, as well as excellent networking opportunities. The 2011 Conference will be held partially online in the form of a virtual conference. For more information, see www.ptec.org/conferences/2011

**APS/IBM Research Internship for Undergraduate Women**

APS and IBM co-sponsor a research internship program for undergraduate women, to encourage female students to pursue graduate studies in science and engineering. The deadline for the Summer 2011 internship is February 1, 2011. For more information and the application, go to www.aps.org/programs/women/scholarships/ibm

**Education and Career Workshops at APS March Meeting**

A variety of career and professional development workshops will be offered prior to the upcoming APS March Meeting in Dallas. The workshops include:

- **Teaching Quantum Mechanics** will explore strategies to improve the teaching and learning of quantum mechanics in undergraduate physics courses.
- **Physics Careers in Industry and Government** will focus on non-academic careers for students, early-career physicists, and career changers.
- **Improving Your Skills as a Research Mentor** is based on a research mentor training program developed at the University of Maryland, and modified by APS, and is designed to help research physicists become more effective mentors.
- **Careers in Physics** will cover strategies to help physicists in their job search. Topics will include resume writing, interviewing, networking strategies, and more.

For more information including dates and times, see www.aps.org/meetings/march/events/workshops

Peter Muhoro Joins APS Education and Diversity Department

Peter Muhoro recently joined the APS Education and Diversity Department as the new Minority Bridge Program Manager. Muhoro received his PhD in applied physics from the University of Michigan and is working to build collaborative relationships between minority-serving institutions and doctoral-granting institutions, with the goals of increasing the number of underrepresented minorities receiving doctoral degrees in physics, and of improving graduate education programs at these institutions.

**National Academies Diversity Report**

A recent National Academy report entitled Expanding Underrepresented Minority Participation explores the role of diversity in the science, technology, engineering and medicine (STEM) workforce and its value in helping America innovative and competitive. According to the book, the US labor market is projected to grow faster in science and engineering than in any other sector in the coming years, making minority participation in STEM education at all levels a national priority.

The report is available at www.nap.edu/catalog.php?record_id=12984

**High School, Summer Camp Gain Historic Site Designation**

The APS Historic Sites Initiative honored two sites recently for their contributions to the advancement of physics in the United States. The Bronx High School of Science and the University of Michigan’s historic summer school both have done much to inspire new generations of American physicists. The initiative marked each site with a ceremony dedicating a plaque commemorating the historical significance of each location.

Ben Bederson, chair of the historic sites selection committee, said that the aim of the initiative was “to celebrate the history of what they’ve done and to enlighten the public…The best kind of historic site to identify is one that is important to physicists, but that the public can also understand and appreciate.”

The first plaque, dedicated on October 15, honors the Bronx High School of Science, which has hosted a world-renowned magnet technical school for science and engineering students. The school has a remarkable history; seven students who attended the school in the last 50 years have gone on to win Nobel Prizes in physics.

“It so happened that at the Bronx School of Science, who knows how it happened, seven of their graduates received Nobel Prizes. That’s mind-boggling. How many countries have seven Nobel Prize Winners?” Bederson said.

The school was founded in 1938 as an institution focusing on math and science. Over the years, the school’s reputation has grown and is now considered one of the very top science high schools in the United States and internationally.

Attending the ceremony was Nobel laureate in physics David Politzer, who himself attended the Bronx High School of Science. After the morning assembly where the plaque was dedicated, Politzer stayed for the day at the school, talking to classes and individuals and helping out in science lab. Politzer received the Nobel Prize in 2004 along with David Gross and Frank Wilczek for their work to discover asymptotic freedom in the theory of strong interaction.

The committee also dedicated a plaque at the University of Michigan to mark the historic summer school sessions it held in the early part of the 20th-century.

“It was really a very important tipping point in the development of modern physics in America,” Bederson said.

In the early part of the 1990s, the United States had generally not been seen as a world leader in the field of theoretical physics. Starting in 1928, Harrison Randall, then chair of the school’s physics department, began hosting summer programs at the university to raise the stature of the United States in the field, ultimately taking the program completely to theoretical physics.

“So many important characters almost without exception came to give lectures,” Bederson said, adding that such notable lecturers included Niels Bohr, Hans Bethe, Enrico Fermi, Werner Heisenberg, and Wolfgang Pauli.

“It was an inspiration for America.”

In thanks to part of the Michigan summer school, the United States soon became one of the world leaders in theoretical physicists. APS President Curt Callan unveiled the plaque honoring these summer sessions at the university on December 11. The dedication coincided with the school’s prestigious Ta-Yu Woo Lecture where Nobel laureate Samuel C. C. Ting spoke about the Alpha Magnetic Spectrometer on the International Space Station.

Bederson also emphasized that the selection committee is always looking for more suggestions for future sites from the membership (see the story in the October 2010 APS News, available online). On the initiative’s website, http://www.aps.org/programs/outreach/history/historicsites/index.cfm, there is a nomination form where members can submit their ideas for potential sites to the selection committee.

**Profiles in Versatility**

**At Play, Day and Night in the Museum**

By Alaina G. Levine

Paul Doherty was very direct on the phone. “I have the best job in the world. Wait until you hear what I get to do in physics.” It didn’t take long to figure out why he would tend such a declaration. As Senior Scientist at the Exploratorium, the Bay Area’s hands-on science museum, Doherty is a consummate salesman of science, and he prefers to spend every day to an enthusiastic customer base. The physicist is involved in a multitude of arenas within the world-famous science museum, from designing and building exhibits, to teaching teachers how to use the museum’s tools to inspire their students, to advising others about how to build their own less-expensive versions of the exhibits. He was the Founding Director of the Center for Teaching and Learning, and has traveled to Zambia, Greece, the Gobi Desert, and Antarctica leading Exploratorium trips to teach and excite others about science. He has written dozens of articles and books, including the Explorahook, which has sold more than one million copies.

Doherty is constantly contemplating and orchestrating new ways to motivate kids and adults to pursue science, either as a career or an avocation. And although “I have been approached by recruiters [for other jobs],” he testifies, he just can’t leave. “I can’t get any better than this.”

Luke Donev, another PhD physicist who ventured into museums, is the Educator/ Applied Science Lead for the Dal- las Museum of Nature and Sci-

MUSEUM continued on page 6
Focus on APS Sections

Students Are Key at Southeastern Section
By Mary Catherine Adams

Editor's Note: This is the sec-
don of an occasional series of columns highlighting the history and current state of APS Sec-
tions. The first column appeared in October. There are currently more than 160 sections represen-
ting most of the United States and parts of Canada. Students are at the heart of the Southeastern Section of the APS (SEASPS), and physicists serving in the various chair pos-
tions of the section's executive committee see students' interests as paramount in the section's an-
nual meeting.

"What can you do that bigger meetings can’t do?" one asked. Focus on students, was the an-
swer.

This year, at the section's 77th annual meeting, in Baton Rouge, nearly half of the attendees were undergraduates.

The purpose of the Southeastern Section was to make the meeting student-friendly, Vice Chair Roxanne Springer of Duke University said, giving students the opportunity to interact with physicists in an environment that's less intimidating than a national meeting.

For Laurie McNeil, the sec-
tion's chair-elect from the Uni-
versity of North Carolina, the section is still the best preparation for students.

"It's the first meeting I take the students to," she said. "It's good for them to get the experience of going to a real APS meeting," without all the pressure of a national meet-
ing, she said.

At last year's meeting, three popular sessions focused on the relationship between physics and teaching, one new session on physics education research. Four speakers, one of them the current SEASPS chair, gave talks on "What can we do about the dearth of qualified high school physics teachers (and high school physics students)?"

The third education-based session addressed the issue of diversity in physics, a disci-
pline of science where minority 
groups are significantly under-
represented. In this session, David Ernst, the section's past chair, described how the bridge program he helped to establish ties the masters program at Fisk University, a historically black university, into the PhD program at his own Vanderbilt University. By establishing what he calls a "great working partnership," he has been able to attract students that show promise through hard work and intel-
ligence but who have holes in their academic record. After considering the lack of opportunity early on, giving them the chance to pursue PhDs.

Forty-three minority stu-
dents have been admitted to the bridge program since its incep-
tion in 2004 and 18 have gone on to pursue PhDs at Vanderbilt. About six of those students are expected to graduate in 2011. "If we add up to three or six a year," Ernst said, "this is a significant contribution," to the 25 or so members of institutions that earn PhDs each year.

Although the annual meetings revolve largely around students, they also give the society the op-
portunity to celebrate excellence in physics. The section gives out three awards each year, one for teaching, one for research, and one for service. This year, cur-
rrent chair Paul Cotton of Florida State University said, are a "fa-
cinating snapshot of the region in physics." In 2010, the awards went to Ameer Lahamer, chair of the Berea College physics depart-
ment in Kentucky, who is making a difference for students with disadvantaged backgrounds in a less-affluent region of the country; Beate Schmittmann, a Virginia Tech physicist doing condensed matter research; and Florida State University's Kir-
by Kemper, a nuclear physicist whose work has had an influence across the nation.

"The awards reflect the re-
markable range of things phys-
ic educators in our region do," Cottle said.

Although the 2,700-member section that encompasses 10 states in the southeastern US only started giving awards as re-
cently as 1971, it has been active in education since its inception in the 1930s. Some in the section claim that it is the oldest of the APS sections although it was, admittedly, the second section to join the Society. They argue that the southeastern group had existed as an independent phys-
ic organization before joining the APS in 1937, making it older than the New England Section, the third to join APS.

The one concern that remains primary to each of the leaders is the future of physics. In upcom-
ing years, section leaders plan to focus increasingly on career de-
velopment for physics students by reaching out to them at an-
nual meetings.

The Southeastern Section has rem-
inded students of the broad range of ca-
reer opportunities that lie ahead. Young physicists, she points out, can go on to become 
governmental, industrial physicists, science writers, museum curators, high school teachers, tech-
nical writers, technical sales-
men, public outreach proponents and more.

"Everyplace you go, you’ll find a physicist," McNeil said.

MUSEUM continued from page 5
ence. Although he has only been a professor and performing outreach programs for up to 1500 youngsters a week, he too is crystal clear about his future goals: "I hope to continue to go up in front of children and shock myself and blow things up and do anything I can to get them excited about physics." He said, "I feel a PhD in physics has given me a toolbox of training that has allowed me to enjoy a vast array of jobs...I think that’s what’s going to be the difference for students.

Although a short while later the president and the board of trustees had designated the museum for a year, designing and developing a new Outreach program for up to 1500 students was "too late for me," says Stein-
er, and he started investigating other options. At the time, institu-
tions were becoming increasingly interested in online education. He went to Columbia Teachers Col-
lege where he developed their first web-based course, and in 2003 AMNH hired him to oversee their own science education program for K-12 teachers. Today, 1100 educators per year take the online courses that AMNH provides. "We take great pride in the scientific rigor of these courses," says Stein-
er. "We spend a great deal of time and effort to create rigorous, intelligent courses that are relevant and useful to the teachers.

"I’ve always enjoyed teaching," says Stein-
er. "Physics is tradition-
ally known as being scary, intimi-
dating, abstract. But for students, it’s not really scary because they have it, to and it’s a trial by fire. If I can help them understand it, they can make it cooler and beautiful and wonderful and worth spending time learning, it’s very satisfying." AMNH has over 200 scientists, across different academic units. With 32 million cultural and sci-
entific artifacts, "the scientists are the stewards," says Stein-
er. "Our goal, for the teachers, is to increase understanding of science and the process of scientific inquiry, and connect them with valuable educa-
tional resources."

In addition to curriculum de-
velopment, management and ex-
ecutives, Stein- er has worked on expanding the museum's outreach efforts to pursue external funding for his program. He currently serves as a PI on a $500,000 grant for the NASA Global Climate Change Education program, an opportunity he counts as one of his proudest professional achievements. "There is enormous satisfaction and pride in being given the opportunity to help ad-
dress the ongoing crisis in science education in this country," he says.

Recently he was appointed the Victor F. Hess Professor of Environmental Technologies of the American Association of Physics Teachers, an organization which "allows me to gather more information about career op-
tions within the industry. Cer-
tainly there is opportunity within the education and exhibits depart-
ment, but larger centers such as AMNH also offer full-scale re-
search divisions. For example, the research division of the National Geophysical Institute of the Astrophysics Department at AMNH, is headed by physicist Neil deGrasse Tyson. Scientists at museums are encouraged to publish, attend conferences and collaborate across institutions. Administrative career paths are also available, once you establish yourself, gain experience, and understand how museums oper-
ate, says the sources. "There are no bottlenecks to advancement," notes Stei-
ner.

But before you leap from the ivory tower to the museum world, with dinosaur bones and ping-pong balls, be forewarned: "The cul-
ture of museums is not like the culture of an academic institution," says Doherty. "It’s the first time I've understood why. "We had culture shock for the first three years." He says this is especially apparent in the use of vocabulary across the industry. "Museums take words and give them new meanings," he explains, especially in exhibit management and even in the common terms like "hands-on learning" or "educa-
tional standard" have different definitions and uses in museum speak.

Doherty also points out other bewilderments—when he first ar-
rive at the museum, he was sub-

The center of our Milky Way can be assessed by observations with exquisite resolution and sensitivity covering 18 orders of magnitude in energy of electromagnetic radiation. The orbits of more than 2,000 stars and the measurements of their size and motion of the central compact radio source, Sgr A*, demonstrate the presence or existence of a massive black hole of about 4 million solar masses. This review summarizes the recent progress in observational and theoretical work on the central parsec, emphasizing the empirical evidence for a central massive black hole and the processes in the surrounding dense nuclear star cluster, including the apparent recent star formation.

http://rmp.aps.org

SCIENCE continued from page 3

search and education to revive the economy and keep it humming. But every dollar that other policy changes add to the federal debt may require a trade-off. I hope I am right!

To make no mistake about it: the days of privilege for science may be coming to an end. Already, the National Science Foundation, which boasts of almost universal support on Capitol Hill, is facing a budget cutoff in the crosshairs of political snipers. Eric Cantor (R-VA), who would become House majority leader on January 5, has issued a challenge to voters on his website (republicanwhip.house.gov/YouCut/Review.htm). Find NSF grants that are “wasting” taxpayer money, and the House leadership will see them as cuts. As much as domestic science may be ripe for increased scrutiny, international projects could become even more suitable for future funding. The 2010 campaign, third party advocates repeatedly attacked federal spending on research taking place on foreign soil. As increases in numbers of Tea-Party-backed Republicans question the bang the country gets for each federal buck invested in science, the President may once again have to be faced with the choice of deal or no deal. How he responds and whether former GOP stalwarts join him in their traditional support of science may be key in our nation’s future. If they don’t stand up for science, Europe and Asia will be eating our innovation dinner as well as our lunch.

2011 Katherine Weiner Award

The Weimer award is open to any female plasma scientist who received her PhD within the ten-year period prior to April 1, 2011. Nominations are active for one selection cycle (three years).

The award consists of $2,000 and funds to travel to the annual meeting where the award is to be presented. The recipient will be invited to give a talk at the Division’s annual meeting.

To nominate a candidate, send the following to women@aps.org:

• A letter evaluating the nominee’s qualifications and identifying the specific work to be recognized
• A biographical sketch
• A list of the most important publications
• At least two, but no more than four, seconding letters

Deadline is April 1, 2011.

www.apspp.org/prizes/awards/katherine_weimer.php

MEETING continued from page 1

On Sunday, graduate students are invited to Luncheon with the Experts. Graduate students can sign up to dine with known experts in a field that interests them in an atmosphere of informal discussion. The list of topics will be available on the April Meeting website in January, and signups, on a first come, first served basis, will be at the meeting itself starting at 1:00 on Friday April 29.

Also for students is the APS Student Resource Room, open Saturday through Monday, 10 am to 3 pm. There students with free entry stickers can interact with fellow students, peruse society literature, and enjoy complimentary refreshments.

Throughout the hotel, booths with tabletop displays will be set up for exhibitors to show off their products.

Student members are invited to stop by APS’s Contact Congress booth to send letters to their members of Congress about the importance of federal science funding.

On Saturday, we will have a special session titled “How do you become a plasma scientist?”, primarily for students. The session will be at 2:00 pm in Room 250.

Application deadline is 15 March 2011.

www.aps.org/programs/international/us-india-travel.cfm

for more details, including application guidelines.

Accepting Applications: India & U.S. Travel Grants

The Indo-U.S. Science and Technology Forum (IUSSTF) sponsors and the APS administers the exchange of physicists and physics graduate students between India and the U.S. Through the Physics Student Visitor Program, U.S. and Indian graduate students may apply for travel grants of up to $3,000 to pursue opportunities in physics. The funds can be used to attend a short course or provide physics a short course or provide physics lectures at an institute in the U.S. or India. Awards are for up to $4,000.

Q: What have been some of your career highlights?

A: As a young child, I had two dis-tinguishing passions, first an early love of mathematics and second, an intense curiosity to understand the world around me. Little did I know that physics represented a wonderful merger of these two passions, in particular using the crucial underlying tool to under-stand the physical phenomena that interested me so much. Even-tually, I put that together and the rest is history!

Q: What do you think of these efforts and how will they help us?

A: I think of these efforts and hope that they will have a significant impact on where they will make a difference.

Q: How will you guide APS through the current difficult eco-nomic times?

A: APS finances are stable. We are a non-profit and the services we provide are matched to our income, and are monitored care-fully by the treasurer with advice from our budget and finance com-mittees. Our reserves have largely recovered from the losses dur-ing the economic downturn. The biggest uncertainty is the future income path of our journals. University libraries are under growing financial pressure, and publishing is becoming more electronic and open access. We are working to maintain our high-quality jour-nals and respond to these changes.

Q: What do you think of these efforts and how will you guide them?

A: We have a very active and ef-fective education outreach pro-gram. The opportunities are much greater than what we can do, however, with our small staff and effort, so we must make sure we choose areas with the largest im-pact. We are active in efforts that educate the public, and this can have a large payoff. We are also making efforts toward broadening the discipline and more generally in improving physics teaching. I am enthusias-tic about these efforts and hope that they will have a significant impact on where they will make a difference.

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Teachers who responded to our call claimed to be more concerned with erosion of autonomy, professional status, and teaching quality than with the testing required by NCLB and locally controlled Annualized Yearly Progress (AYP) plays havoc with class scheduling and with students’ perception of the value of science. Teachers want recognition, support, relief regarding daily prep and a sense that science and math is a priority in their school and in their state. The science community is woefully short of physics-trained teachers. Indeed, based on recent data, an estimated 20,000 practicing scientists and engineers could benefit from them.

If your state has written an RTP proposal, whether or not it's been funded, read it, and go public if you and your colleagues feel the new accountability standards will limit science teachers’ effectiveness; get to know the secondary science department chairs in your local school district. Organize a sounding board that exposes your colleagues to their lives and work; Invite science teacher leaders to make presentations at area physics conferences to discuss the impact of the latest reforms on the quality of their teaching, their professional status, and their overall ability to recruit the next generation of scientists; Think about the participation in alternate systems of evaluating teachers. Examine end-of-course examinations. Teachers have no problem if you’re not asked. Make your judgment as to what extent they will promote meaningful instruction; At the end, it’s up to you: How are you going to teach the test, it had better be a valid test!

Sheila Tobias has been writing about what we teach and how since the 1990s. Best known of her books are: The Gathering Storm, 2nd Ed., Vo.73, issue 2, 417-458. APS News welcomes and encourages letters and submissions from its members responding to these and other issues. Responses may be sent to: letters@aps.org

1 For a more general critical overview see Diane Ravitch (2010), The Death and Life of the Great American School System: New Testing and Choice are wholly responsible for pupils’ underperformance,” as measured by standardized tests.

When that policy spurred U.S. News and World Report dubbed NCLB “the Race to the Bottom,” Arne Duncan, the newly selected Education Chief (2009), shot the shot with a promised infusion of $4.2 billion to be distributed to states that meet strictly enforced “accountability” measures, which, without acknowledging the irony, he calls Race to the Top. The stipulated “accountability” measures are to be used to recognize effective teachers (and their value added) compared with those of other teachers.

The teacher has invented a term of her own to characterize this distortion. She calls it the “ceiling effect.” We might call it a saturation effect.

The “Ceiling Effect”

It is of course too soon to anticipate the immediate and long-term effects of Race to the Top, since so few states (12) have been funded to implement the full range of the policy. But value added has already found its way into certain school districts for the purpose of assigning bonuses. In Houston, where a new value-added formula is being used to grade teachers’ skills, N.Y.Times education writer Sam Dil· lon found a high school physics teacher out of the running for high bonuses because, as she reported, “My kids come in at a very high level of competence, scoring well before the semester begins.” After she teaches them for a year, they continue to score well on a state science test but show less measurable “gain” in absolute terms, so her bonus is small compared with those of other teachers.

The teacher has invented a term of her own to characterize this distortion. She calls it the “ceiling effect.” We might call it a saturation effect.

To the general point of this article, if value-added measures are to be used to recognize effective teachers (and to punish or to dismiss ineffective ones), the public needs to have confidence in the statistical validity of the technique. Since students are not assigned randomly (as in a clinical trial) to one classroom or another, VAM can test students coming and going without definitively answering the question: “How would these same students have fared if they had not had X or Y as a teacher?”

Despite the conceptual and practical challenges to value-added measures, the National Board’s efforts (see article by Steve Leisten) are well-valued and needed, and the Board’s research and development efforts are to be commended. But the Board has the potential to promote a philosophy of teaching and going without definitively answering the question: “How would these same students have fared if they had not had X or Y as a teacher?”

The seminal paper, “Objective component of teacher evaluation: A feasibility study” was published by W.L. Sanders and R. A. Mclean in 1984, in a power-point presentation available on line), “so powerful a model, it should. The proponents are for the most part, like Dan Goldhaber, economists or professors of business management.1

The teacher presents his or her students are not like (elementary) mathematics problems yielding to a single right answer, but more like puzzles inviting discussion and dissent. Above all, assessments they can trust.

The problem with outsiders measuring science teachers’ “effectiveness” is embedded in what is different about science. One cannot measure science from outside interviews is this: Secondary science teachers are nervous and not just because their standing, their value to their schools, and their salaries and tenure will become linked to their pupils’ achievement on standardized tests.

They are nervous because the problems an able science teacher presents his or her students are not like (elementary) mathematics problems yielding to a single right answer, but more like puzzles inviting discussion and dissent. Above all, assessments they can trust.

The science teacher’s responsibility is not only to convey these facts and insights but also to enable the “aha” reaction, to help students see how science works and going without definitively answering the question: “How would these same students have fared if they had not had X or Y as a teacher?”

Sheila Tobias has been writing about what we teach and how since the 1990s. Best known of her books are: The Gathering Storm, 2nd Ed., Vo.73, issue 2, 417-458. APS News welcomes and encourages letters and submissions from its members responding to these and other issues. Responses may be sent to: letters@aps.org