APS Delegation Fosters Closer Ties with China

A team of physicists representing APS traveled to China in September to enhance the Society’s engagement with the Asian nations.

The delegation visited six cities in nine days, and met with dozens of physicists, professors and other leading members of the physics community in China. A second delegation representing the APS publishing offices also traveled through China shortly afterwards, overlapping briefly.

“The reason to go was to explore ways that APS can foster more international engagement with the Chinese physics community,” said Kate Kirby, Executive Officer of APS. “There are already a lot of good collaborations that are taking place on an individual level. In addition to Kirby, representatives from APS included Director of International Affairs Amy Flante; Kartsten Heeger, Chair of the APS Committee on International Scientific Affairs; and Gang Cao, a member of CISA. The editorial delegation included Manolis Antonoyiannis, the Senior Assistant Editor of Physical Review Letters, and Ling Miao, Associate Editor of Physical Review X.

“The goal was to explore, listen, and to learn what are the needs of researchers in China, and what are the opportunities for APS members,” Heeger said. He added that the delegation hoped to build connections and relations, get to know some of the researchers and universities, and explore what some of the opportunities for a scientific partnership might be.”

The highlight of the trip was a joint session at the annual meeting of the Chinese Physical Society in Guangzhou. At this first-ever joint APS/CPS session, Kirby gave a talk about the APS, its mission and its activities. APS vice-Presidential Malcolm Beasley also spoke.

CHINA continued on page 7

Preprint Policies: How Confusion

By Brian Jacobsmeyer

For the vast majority of his scientific papers, Terry Rudolph, a quantum theorist at Imperial College, London, had no qualms about posting a preprint on the popular arXiv server. But this one was different.

This research would soon be widely considered one of the most important papers on the foundations of quantum mechanics in recent years. Rudolph submitted his team’s paper to Nature and, with some reluctance, posted a preprint of it to the arXiv.

“Nature never appeared in history. However in a highly unusual case, Nature rejected the paper at a late editorial stage after Rudolph and a co-author, Jonathan Barrett of the University of London, posted a surprising follow-up article to the arXiv. In a post on the popular Cosmic Variance physics blog, Rudolph publicly contested Nature’s decision, blaming it in part on the scientific ‘buzz’ surrounding his preprints.”

JOURNALS continued on page 6

APS Offers Public Outreach Mini-Grants

Again this year, APS is offering several grants up to $10,000 each to help APS members start their own outreach programs. In the past, programs such as Claymation videos, puppet shows and video games have received funding. More information about the program, descriptions of past projects and instructions for submitting proposals are online at www.aps.org/grants/outreach. Proposals are due January 11th, 2013.

Quantum Wizardry Wins Nobel Recognition

The 2012 Nobel Prize for Physics was awarded to an American and a French researcher for “ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems.”

David Wineland of the National Institute of Standards and Technology in Boulder, Colorado and Serge Haroche of the Collège de France in Paris are both APS Fellows. Their respective work on different quantum systems has helped to lay the groundwork for finding new ways to control quantum computers and the next generation of atomic clocks.

Wineland’s team developed a technique to prepare individual charged atoms in a superposition of their two lowest energy states. To do this, they confined a system of ions in an electric field and cooled them to their lowest energy state. The team then exposed the ions to a finely tuned laser pulse, which effectively created a superposition of the ground state and the next excited state.

Haroche came up with a complementary technique, which used atoms to measure the quantum state of a photon. He confined microwave photons in a special, Fabry-Perot cavity about three centimeters in size. The walls of the cavity were reflective and cooled to nearly absolute zero so the photons could bounce back and forth billions of times. The team then fired a doughnut-shaped Rydberg atom through the cavity and measured the energy shift of the atom, which they could use to reconstruct the quantum state of the trapped photons.

The subtle changes to the Rydberg atom’s energy states showed that the quantum superpositions of individual photons could be detected. Moreover, physicists using this information could reconstruct the wave function of the photon as it collapsed.

To study the phenomena, Haroche and his team used photons to study atoms, Haroche told the Nobel website. “So, it’s really symmetry.

Nobel continued on page 5

Buckley Prize Receives Major Donation from Taiwanese Company

The HTC-VIA Group of Taiwan has made a donation of $140,000 to support and enhance APS’s Oliver E. Buckley Condensed Matter Prize. The Buckley Prize is the oldest APS prize, and one of the most prestigious.

The award is given to researchers who have made significant contributions to the field of condensed matter physics. Until this year, the stipend of the prize had been $10,000, but with the new donation, it will double to $20,000 for the next seven years.

The donation was made possible by Cher Wang, the founder and chair of HTC and VIA Technologies, and her husband Wenchi Chen, CEO of VIA technologies. “The American Physical Society is thrilled with the generosity of Cher Wang and Wenchi Chen in reinvigorating the Buckley Prize, enabling the award amount to double,” said Sam Bader of Argonne National Laboratory, former chair of the Division of Condensed Matter Physics. “The Buckley Prize is a premier prize of the APS. Over the years its ranks have included as many as sixteen who also became Nobel Prize winners.”

Professor Nai-Chang Yeh of Caltech first reached out to the couple, who are ranked by Forbes amongst the top ten richest people in Taiwan. VIA Technologies is a major integrated circuit and computer chip manufacturer, while HTC manufactures smartphones and tablet computers. "They very much appreciate the high status of the recipients who have received this prize, and more so that it is very much in line with what their company does,” said Darlene Logan, APS director of development.

The prize was established in 1952 by AT&T Bell Labs in honor of their president, Oliver E. Buckley, who retired the previous year. With the new donation, the HTC-VIA Group will also be named as the official co-sponsor of the award. Also, in recognition of their contribution, Wang and Chen have been invited to travel to the APS March Meeting in Baltimore. “They will be invited to come and present the prize with the APS President,” Logan said.

Of Historical Significance

Roger H. Stuewer of the University of Minnesota (center) is the 2013 recipient of the APS Abraham Pais Prize in History of Physics. In the photo he receives a certificate and a medal from APS President R.朗诵the editor emerita Gloria Lubkin (left), who is vice-Chair of the Committee, and Category Good, Director of the Center for History of Physics of the American Institute of Physics, who is APS representative on the committee. The announcement of Stuewer’s selection as the Prize recipient took place on September 24, at the 50th anniversary celebration of APS's history programs, commemorating the dedication, in September of 1962, of the Nils Bohr Library and Archives by J. Robert Oppenheimer.
Members in the Media

“If we can just damage that selectively—without hurting the brain or another part of the body to get there—that’s a big deal.”

George P. Smith, Michigan State University, on the work he is doing with superconducting quantum devices (SQUIDs) to study the brain.

“The idea of creating a crystal with dimensions higher than that of conventional 3D crystals is an important conceptual breakthrough in physics, and it is very exciting for us to be the first to devise a way to realize a space-time crystal.”

Tongcang Li, Lawrence Berkeley National Lab, on using a four-dimensional crystal as the basis of an eternal clock.

“Dove is a paradigm of excellence to be the envy of the true nice guys in physics, which is not something that can be said of all Nobel laureates... His sunny and humble style are entirely unique.”


“I attribute essentially my success to the very large amount of chocolate that I consume... Personally I feel that milk chocolate makes you stupid... Now dark chocolate is the way to go. It’s one thing if you want a medicine for diabetes; I’d rather have chocolate.”


“The potential immediate benefit for cancer detection greatly outweighs the potential for cancer from the radiation that would occur many, many years down the road.”

Robert Och, University of Toledo, on the safety of mammograms, The San Francisco Chronicle, October 10, 2012.

“There are ways to stretch the rules, but evidently the relevant decision-makers felt that there was not sufficient reason to do so in this case.”

Frank Wilczek, MIT, on why he thought the Nobel Committee didn’t award the Physics prize to the researchers who patented the Hilger Boson, The New York Times, October 10, 2012.

“While physicists don’t know it, they are studying Picasso’s paint.”

Volker Rose, Argonne National Laboratory, on how the true zinc oxide Pablo Picasso used in his paintings is now being studied for technological applications, The Chicago Tribune, October 10, 2012.

“Dove is universally acknowledged to be the envy of the true nice guys in physics, which is not something that can be said of all Nobel laureates... His sunny and humble style are entirely unique.”


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APS Bridge Program receives NSF Support

As reported in the October APS News, the NSF recently awarded APS $3 million in funding over the next five years to launch the APS Bridge Program, a national program designed to increase the number of underrepresented students with Ph.D. degrees in physics. The program requests proposals for new bridge sites to develop proposals for such projects. Initial proposals are due February 18, 2013. More information is available at www.APSBridgeProgram.org.

Deadline Approaching for APS Conferences for Undergraduate Women in Physics

November 15 is the last day to apply for the APS Conferences for Undergraduate Women in Physics. Learn more about the conferences and find the closest one to you at www.aps.org/programs/women/workshops/cuwfp.cfm.

New Effective Practices in Teacher Education: Call for Proposals

The Association of Teacher Education, the APS, and the American Association of Physics Teachers announce a call for manuscript proposals for a new peer-reviewed book entitled Effective Practices in Physics Teacher Education: Recruitment, Retention, and Preparation. This book seeks to provide a practical guide to innovative, state-of-the-art programs, and will include papers and case studies covering a wide range of new teacher education. Manuscript proposals are due February 1, 2013. More information can be found at: http://www.aptc.org/effectivepracticesbook.cfm.

Minority Scholarship Application Process Begins

The APS, with support from NSF, will host in 2013 two Professional Skills Development Workshops for female physicists. Postdoctoral associates and early-career faculty and scientists are invited to apply for the March 17, 2013 workshop in Baltimore, MD. Postdoctoral associates and senior-level faculty and scientists are invited to apply for the April 12, 2013 workshop in Denver, CO. Graduate senior students are also welcome to apply.

Applicants affiliated with a US institution/faculty are eligible for travel and lodging funding consideration. Those needing funding assistance are encouraged to apply early. The deadlines for the workshops are November 9, 2012. More information can be found at: www.aps.org/programs/minorities/honors/scholarship/index.cfm.

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Registration Open for 2013 PhysTEC Conference

The 2013 PhysTEC conference will be held March 16-17, 2013 in Baltimore, MD, immediately preceding the APS March Meeting. For information, visit the 2013 PhysTEC conference, visit www.ptec.org/conferences/2013/.

Childcare Grants for APS Spring Meeting Attendees

Grants of up to $400 are available for APS March and April Meeting attendees who are bringing small children or who incur extra expenses in leaving them at home (e.g., extra day care or babysitting services). The deadlines for the grants and a link to the online application can be found at: www.aps.org/programs/women/workshops/sk/l.

Funding for Undergraduates to Attend APS Meetings

A limited number of $200 and $1000 travel supplements are available for undergraduate students presenting at the 2013 APS March and April meetings. Students must submit their abstracts by the meeting deadlines, which are November 9, 2012 for the March Meeting, and January 11, 2013 for the April Meeting. Students will also be invited to take part in Future of Physics Days (FPD), which include special events that are planned over the course of the meetings to enable undergraduates to meet their peers, share their research results with other physicists, and begin building a network among fellow physicists. A description of the eligibility criteria and supplement application requirements are coming soon on the FPD website: http://www.aps.org/programs/education/undergrad/studentsfuturephysics/.

Members continued from page 2

"Quantum physics is one of the hardest things to understand, intuitively, because essentially the whole point is that our classical picture is wrong... The world is works in a much more exploratory way. It is aware of all the possibilities at once and trying them out all the time. That is a hard thing to do in physics," said Neil Turok, Perimeter Institute for Theoretical Physics, The Globe and Mail, October 12, 2012.

"The only people who relish a lame duck are hunters in their time and historians. But even they get tired of sitting on the sidelines of the political maelstrom. And never has there been a more spectacular lame duck than the 112th Congress. It is now in the process of giving lawmakers the night off until the middle of January, with some members already shopping for new jobs." -Michael S. Leibl, APS Director of Public Affairs

About the only people who relish a lame duck are hunters in their time and historians. But even they get tired of sitting on the sidelines of the political maelstrom. And never has there been a more spectacular lame duck than the 112th Congress. It is now in the process of giving lawmakers the night off until the middle of January, with some members already shopping for new jobs.

"It wasn’t too many years ago that Congress actually tried to get most of its work done before the first President’s Day. Around Washington, temperatures began to dip below freezing in mid-October, but members of Congress would meet earli-er, leaving all the burning legisla-tive issues on a cold Capitol Hill to cook." -When they return from their hometown turf on November 13, they will face a plethora of daunting decisions: extending the Bush-era tax cuts (or, raising the debt ceiling (“not” is not an option, except for Tea Partisans), addressing the “doc fix” — a pen- nential Medicare sore-putting another patch on the alternative minimum tax and trying to avoid the sequestrations mandated by the 2011 Budget Control Act—a problem that no one envisioned ever happening, but now epitomizes the odious outcome of Washington’s dysfunction. About the only major issue mentioned repeatedly in the November elections was how to deal with is the fiscal year 2013 budget. It’s off the table, not because they completed their work, but because they kicked their principal responsibility down the legislative road until next March. Before they went on the lam at the end of September, they passed a new Continuing Resolution that keeps the dysfunction functioning, at least now. Having ducked their duties for more than a year, will it be business as usual for the lame ducks to deliver anything more than more temporary palliatives? It’s unlikely, but miracles do occur once in a while. -Just ask Paul Broun (R-GA 10th), a medical doctor and a member of the House Science Committee, who last month called evolution, embryology and the Big Bang theory “lies straight from the pit of hell.” Speaking to the Liberty Baptist Church Sportsman’s banquet in Hartwell, Georgia, Broun opined, “You see, there are a lot of scientific data that says God created you; and actually what we should do is culture the earth is 9,000 years old. I believe it was created in six days, as we know that. What is the Bible says.” -If Moses parted the Red Sea, and Jesus walked on the waters of Galilee, miracles surely can happen on the banks of the Potomac. But if the special session with an all-male, all-white Congress is a failure, unfortunately, no miracles are very likely. The lame ducks are more likely to be lazier than usual. Here’s why. -For months, Wall Street and financial titans around the world were warning of another global recession if Washington marches off a fiscal cliff by ig-noring all the daunting tax and spending issues. But more recent-ly, policy makers and econo-mic analysts have said the cliff is really more like a slope. Chad Stone, chief economist for the non-partisan Center on Budget and Policy Priorities, for exam-ple, recently wrote, “A relatively brief implementation of the tax and spending changes required by current law would cause little license to engage the econo-my as a whole.” -That’s probably enough impe-tus for the 112th Congress to fin-ish off the lame duck session and cede to its successor the chore of cleaning up the lingering fiscal mess, after the 113th Con-gress convenes next January 3. -If Chad Stone is correct, the world economy won’t die of suf-focation, but American science and research will be bleeding. Fed-eral agencies are already taking a conservative approach and are withholding funding for many ac-tivities until the new Congress de-cides which programs should be permitted to blossom and which should be allowed to wither. -If they were sufficiently sci-ence savvy, they would make the same precautionary commitment. The damage uncertainty can wreak on research. But most of them aren’t. -So scientists will have to take some valuable time away from their laboratories to explain how a continuing resolution will thwart new ventures and how an eight percent sequestration will seriously damage discovery and innovation. They must begin making the case to elected offi-cials, but they must also begin en-gaging the general public. As polling has shown, apart from medicine, most Americans know little about the benefits science delivers. It’s time to start enlight-ening them. Not time to do so is in the lamest of excuses.

There are currently nine APS Sections, organized geographi-cally across most of the United States, and even into parts of Can-ada and Mexico. One of them will make its debut, covering the last unincorporated region, along the Eastern Seaboard. The Mid-Atlantic Section will include the states plus the District of Colum-bia, a region which encompasses approximately 11 percent of APS members. The new section will be for physicists based in New Jersey, New York, Pennsylvania, Dela-wore, and Connecticut, as well as most of Penn-sylvania and West Virginia. The region is home to numerous differ-ent scientific institutions including major research universities, small liberal arts colleges, a national military academy, the headquar-ters of dozens of scientific and professional societies, the National Academies, numerous government laboratories and government agen-cies. The APS Council is slated to vote on the proposed section’s by-laws on their November 3 meeting. If the bylaws are passed, the sec-tion needs 200 members to offi-cially form in January 2013 as a full-fledged active section. At press time, Council had not yet voted, but pas-sage of the bylaws is expected. -The nomination of NIST spearheaded the effort to set up the new section. He said that after he moved to Maryland from the University of Washington, he missed the networking opportuni-ties the Northwest Section offered, as well as the chance to catch up on different sub-fields in physics at the sectional meetings. -You don’t see the broad per-spective, he exclaimed. -I really miss that here." -Schlamminger said on the lack of a Mid-Atlantic Sec-tion to Beverly Berger, a former chair of physics at Michigan’s Oakland University and NSF proigest. She advised him to do something about it and put him in touch with Charles Clark of the University of Maryland and the APS Council. -The nomination was submitted in the region to find interim offi-cer while the group sets up and is now Chair of the Nominating Committee. Schlamminger also contacted APS Director of Mem-
Communication can be Counterproductive

Got science? Carl Safina, a man of many awards, is published in APS News October Back Page, to bestow their superior wisdom on the benighted masses of this world. Not to be sure, for this is pure, unadulterated, but out of the pure love of truth, which is its own reward. Nevertheless, to the family of politicians will rain dol-]

You are correct. In his first paragraph is that science is very subjective, and thus bridge our differences is what we came from. Nor are subjective ideologies and profit points out, their work is inherently unjust, and thus they frequently pursue ignoble ends and narrow interests. That is partly because, as Mr. Robinson points out, their work is inherently unjust. Again, my aim was not to analyze those professions or their vulnerabilities, but to draw a clear line between the subjective ideologies and profit motives driving other endeavors and the main thing that makes science special, which is, indeed, its subjectivity. It is the ideal of objectivity in its continuing search for truths. That should make scientists proud and excit-}

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Need to Bring All Vocations to the Same Table

Carl Safina’s Back Page commentary literally took my breath away. In the process of answering the question, “Why Communicate Science?” he claimed our work as physicists is to be the singular value that by comparison the work of lawyers, politicians, and business people was just mere window dressing. That Safina would so dismiss the vocations of those we need to most communicate with dem-}

Carl Safina Responds:

In “Why Communicate Science?” I wrote that I believe most scientists should seek ways to make science more familiar to the non-scientist. What I meant, in line with my bucket-list proposal, was to be a sort of journal commissar to the work of your advisors, to be gathered to your fathers (to use an archaic expression), which would not have happened if I had been ten years more be-}

Bayesian thinking simply works better than arguing over who is right or wrong as we focus not so much on where we are in the scheme of things, but on how far we have come. And that’s a pretty special thing. Consider global climate change. We now know that even pre-schoolers left to their own devices. The subjectivity of our knowledge and thus bridge our differences. That is partly because, as Mr. Robinson points out, their work is inherently unjust. Again, my aim was not to analyze those professions or their vulnerabilities, but to draw a clear line between the subjective ideologies and profit motives driving other endeavors and the main thing that makes science special, which is, indeed, its subjectivity. It is the ideal of objectivity in its continuing search for truths. That should make scientists proud and excit-}

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Ig Nobel Research is Serious, After All

By Michael Lucchella

APS journals were big winners this year’s Ig Nobel prize ceremony, held in late September in Cambridge, Massachusetts. Both the Physics Prize and the Fluid Dynamics Prize were presented for research that was first published in the Physical Review.

According to their founder, Marc Abrahams, the annual Ig Nobel prizes are awarded to re- search that “makes people laugh, then makes them think.” They’re given to scientists whose scientific publications on the surface might sound silly or even frivolous, but have meaningful science behind them.

For instance, characterizing the physics of ponytails was first published in February’s Physical Review Letters. The authors of the paper, titled “Shape of a Ponytail and the Statistical Physics of Hair Fiber Bundles,” developed an equation to predict the shape of almost any configuration of hair sticking out of the back of one’s head.

“We set ourselves the task of trying to understand the balance between the elasticity of fila- ments, their weight and the cur- vatures, the random curliness that gives the volume to hair,” said co-author Raymond Goldstein of the University of Cambridge. “Hair has a characteristic stiffness and mass per unit length which to- gether with gravity, define a length scale over which gravity will bend them. Less than two inches, and the hair will straight out, largely unaffected by gravity. Longer than those two inches, and the hair will bend under its own weight. The team dubbed the ratio of a person’s actual length of hair, to those two critical first two inches as ‘Raymond Number’ after the fairytale damsel in distress. The larger the number, the bigger the ef- fect gravity has on the hair.

“Physics is all about under- standing real world phenomena from a small set of fundamental principles,” said co-author Robert Byer of the University of Warwick.

“Our understanding of the bend- ing of a hair fiber is just the same as our understanding of the elas- tic bending of beams in civil en- gineering,” he added. “That strands of hair are also akin to the long molecules of polymers, so under- standing how heat behaves comes over into the microscopic world.

Also ripped from the pages of the Physical Review is Rouslan Krechetnikov and Hans Mayer’s research into the fluid dynamics of a cup of coffee. Their paper, “Walking with coffee: Why does a cup of coffee, even on a flat surface, move?” was first published in Physical Review E in April.

As it turns out, the period of oscillation for coffee in a standard mug is almost exactly the same as the length of time for a person to take a step. When someone carry- ing a cup of joe takes a step, the coffee sloshes forward then back again. By the time the liquid flows forward a second time, the person is already moving forward, and then back again to the forward momentum of the drink. The sloshing keeps intensifying, as the coffee crests over the lip of the cup, and spills onto the ground.

“In general this problem is a confluence of several subjects, namely fluid dynamics, dynami- cal systems, biomechanics and be- havioral dynamics,” Krechetnikov said. “A paper on the walking of a person and coffee is a great fit for espresso drinkers. The oscilla- tion frequencies of tiny espresso cups even closely match a person’s average stride, making it even more likely for one’s drink to spill. His investigation into the phys- ics of coffee stems from research into other, more serious, areas of fluid dynamics, such as aerody- namics, hydrodynamics and geo- physics.

“We need to understand the underlying physics and also to de- velop and theoretical foundation,” Krechetnikov said. “Walking with coffee is just one of the examples of such kinds of systems.”

Other winners at this year’s ceremony include the Medical Prize for research preventing con- founding cosmic gas explosions during cosmic inflation; the Chemistry Prize for a company that converts obsolete Russian Munitions into nanodia- ments; and the Economics Prize, for a team of researchers who dis- covered that due to improperly cor- rected statistical errors in FMRI scan data, they were able to detect active brainwaves in a dead fish.

The winners of the 2012 Ig Nobel physics prize (from left to right) Patrick Warren, Joseph Kettler, Raymond Goldstein and Robin Ball deduced the mix of forces act- ing on a human pony tail.

NOBEL continued from page 1

and, at some point during our work, we published papers back-to-back. Just by chance, it happened that we are doing simi- lar things on his atoms and my photons.”

The ion traps invented by Wineland have become important tools for developing applications. His traps have also been used to develop “optical” atomic clocks one hundred times more accurate than the current “cesium stan- dard” used today. Other research- ers have taken the accuracy af- forded by an optical clock and used it as a tool for atomic charac- terization in the flow of time caused by the different pull of gravity at two points a foot apart in altitude.

All of this research has also been turned into the fundamental pro- cessing units of a future quantum computer. Each quantum bit of information, instead of only being either a 1 or a 0, can be both simultaneously, increasing the processing power over conven- tional computers by an expo- nential amount. In July of 1995, Wineland and his team were the first to demonstrate a simple logic gate using these qubits, effective- ly the first basic computation us- ing a quantum processor.

Wineland, who was sleeping when he first received the call from Stockholm at four in the morning, said that it was a “won- derful experience, a wonderful day.”

“It’s always been great [and] really exciting to be in this field,” Wineland told the Nobel web- site shortly after he received the news.

Wineland previously was awarded the APS Davison- Gurnee Prize in Atomic and Sur- face Physics in 1990, and the 2001 Arthur L. Schawlow Prize. He was also invited to the 1996 DAMOP meeting, an honor which brings distinguished in- ternational physicists to speak at APS meetings. APS president Robert Byer commended the two winners of the prize.

“Haroche and Wineland have both brought quantum technol- ogy to the technology that truly makes this the century of the quantum,” Byer said. “Modern telecommu- nications are built atop quantum tech- nology, and things like the GPS system so many people use on a daily basis wouldn’t be possible without ultra-precise clocks that exploit quantum effects of the type they explored. Someday, concepts of quantum mechanical systems, much like those in the labs of Haroche and Wineland, may solve problems even more advanced of even the most advanced of to- day’s computers. It’s certainly amazing work these physicists have done, and continue to do, and well worth the Nobel com- mittee’s recognition.”

Last spring, after more than a year of work on the part of lead- ership, volunteers, and staff, APS unveiled its new five-year strat- egic plan. This plan, which will appear in APS News at frequent intervals, is intended to update members on progress in imple- menting the plan. The first install- ment, below, deals with the early activities of two new task forces. For the complete text of the stra- tegic plan, please see http://www. aps.org/about/strategy/upload/ strategicplan.pdf

Development Task Force Holds First Meeting

A key area of concentration in the strategic plan is to “undertake efforts to build a comprehensive Development strategy” so as to help assure the future financial stability of APS. In pursuing this objective, a Development Task Force has been formed to pro- vide recommendations to the APS Board on optimal Development Office operations and future fund- raising opportunities. Current APS vice-President Malcolm Bea- sley chairs this Task Force and has recruited a galaxy of academic, industrial and science administra- tion leaders who have experience in successful fundraising. Task Force members include: Robert Birgeneau, Chancellor, University of California, Berkeley; James Bray, GE Global Research; Cher- ry Murray, Dean, School of En- gineering and Applied Sciences, Harvard University; and Ray Or- bach, Director, Energy Institute, University of Texas, Austin.

Gary Bjerkland, a physicist and investor formerly at Bell Labs and IBM Research Labs, has agreed to serve as a consultant to the Task Force.

In the past, APS has been grateful for support given from government agencies and labs, corporations, foundations and individual members of the Society. But as noted by Beasley, “the climate and approaches to development are changing rapid- ly, and I am pleased to have such a strong group of APS members to help us consider these issues.”

The Task Force will be explor- ing current trends and specific issues relevant to APS Develop- ment. These include the political funding environment, diminished number of corporate research labs, decreased top physics leadership in large corporations, proliferation of smaller-scale entrepreneur- ial companies, expectations of younger hands-on donors, the use of social media in the fund rais- ing environment, opportunities as a result of the nation’s focus on STEM initiatives, and operational needs in launching the next major campaign for APS.

The Task Force held its first meet- ing in Chicago on August 29, 2012. Extended discussion took place on the issues mentioned above and further informational needs and action items were iden- tified. Several additional meet- ings will take place before the Development Task Force provides its recommendations to the APS
in Germany, capable of producing high-voltage electron beams that left bluff flame-like tails of ion- ized air in their wake. Bruch and Lawless then accelerated these electrons into cubes of plastic, and the resulting electrical breakdown created a cloud of smoke that illuminated Lichtenberg figures perfectly in three dimensions. Today, the Dynatron at Kent State’s Neo Energy Research Center and one can buy such “frozen lightning” sculptures as artwork. Lichtenberg enjoyed a certain amount of prestige and respect from his scientific peers while he lived. Alessandro Volta visited Lichtenberg in 1784 expressly to meet Lichtenberg and observe some of these experiments, and Karl Friedrich Gauss attended several of his lectures. His name is less well known today, but he would no doubt be gratified to find these eponymous fractal patterns still inspiring scientists and artists alike, nearly three centuries later.


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Lichtenberg’s post echoes the fears of many physicists who avoid or limit post printing at the arXiv during the peer-review process in academic journals, despite ex- plcit journal policies that allow such practices. Emails obtained by the authors through Freedom of Information Act (FOIA) requests with Nature editors have revealed a muddled case that centers on the authors’ follow-up preprint that involved three different editors and some outside experts.

Adapting to Change
Such a reaction 20 years ago, when the arXiv preprint server (arXiv.org) emerged as a primary source for many physicists seeking publication, may not have seemed necessary in their field. Although arXiv preprints aren’t truly peer-reviewed, researchers in some sub-disciplines frequently depend on the arXiv for more than academic journals.

“I think putting things on the arXiv is much more important,” said Matt Leifer, a quantum theo- rist at University College London. "More important than getting it into a journal."

As the arXiv has become more influential, journals have adapted. Physical Review Letters and other journals have posted preprints of open-access articles, and APS permits authors to post preprints of submitted ar- ticles (see this month’s Back Page for a comparison of various APS policies). Embargo policies at Nature and Science explicitly allow authors to post preprints of submitted articles without penalty, provided the authors don’t actively pursue press coverage.

“The arXiv caught us a little by surprise at the start,” said Ivan Oransky, the founder of the re- search transparency site Embargo Watch blog. “It was certainly the biggest re- sponse among some of our colleagues to the advent of the arXiv,” said Rudolph. "It’s a bedrock assumption of science," said Rudolph, "that the communication of results is less well known today, but he would no doubt be gratified to find these eponymous fractal patterns still inspiring scientists and artists alike, nearly three centuries later.


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at the meeting, delivering a talk about the importance of science as an international endeavor.

“I think the fact that we had the first joint scientific session was very important,” Heeger said. “I think this is a starting point for further engagement of APS with China and physics in China.” The delegation scheduled the trip to coincide with three major physics meetings in China. They attended the Shanghai International Summer School of Neutrinos and Dark Matter, the annual meeting of the CPS and the International Symposium of Neutrino Physics and Beyond at Daya Bay in Shenzhen province. These three happening concurrently provided a nice package of events to build a program around,” Flatten said. “That created the opportunity to put together a larger trip and visit some universities as well.” The delegation visited five universities during the trip, including Nanjing University, Fudan University, and Jiao Tong University in Shanghai, the Hong Kong University of Science and Technology and the Chinese University of Hong Kong.

“At each of the universities, we had productive discussions with the department chair, and often the dean,” Kirby said. “We found, for instance, that there was a tremendous interest at one university in hearing more about physics education.” She added that many of the people they met had studied in the United States in some capacity and that many of them were already members of APS or even APS Fellows.

APS currently has 324 members living in China, 84 in Hong Kong and 259 in Taiwan. Heeger himself has been working in China on neutrinos at Daya Bay. As China’s international stature in science continues to grow, leaders in the physics community see lots of opportunity for more collaboration and cooperation between US physicists and those based in China.

“Publicizing APS journals is a really high priority for them,” Kirby said, adding that there are many physicists in China interested in getting involved with refereeing papers. “They also value greatly the possibility of fellowships. Those honors carry a lot of weight.”

Part of the recently announced APS strategic plan is to foster more international collaboration. Within the next year, the Society is planning to set up a task force on international engagement to define more specifically how to institute such connections. Heeger said that he hopes that APS could set up an exchange program with China, akin to the ones already established with Brazil and India. “I think it is a starting point for the development of a program with China,” Heeger said. “And hopefully a starting point for APS to build a program with other countries in Asia.”

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The Back Page

APS and the Challenge of Open Access

By Joseph Serene and Gene Sprouse

Joseph Serene is Treasurer/Publisher of the APS. Gene Sprouse is APS Editor in Chief.

As many readers of APS News will realize, APS has just completed a major strategic planning exercise. Not surprisingly, a significant component of that exercise concerned challenges facing the Society, and Open Access to the APS journals held a prominent spot among those challenges.

We believe that APS has a well thought out approach to the challenges and opportunities presented by Open Access. Though our approach continues to evolve in response to new developments, it is grounded in a consistent core of both philosophy and practice reaching back at least fifteen years. Nevertheless, discussions surrounding the development and implementation of the APS Strategic Plan have made us keenly aware that relatively few of us know our policies on Open Access or the fundamental principles underlying and guiding them.

This article aims to provide an overview of the policies, practices, philosophy, and plans of APS regarding Open Access. As an introduction to what follows, we offer the following “elevator speech” summary: (1) APS supports the principle of Open Access to its journals to the fullest extent consistent with financial stability; (2) peer-reviewed journals continue to be essential to scientific research; (3) high-quality peer-reviewed journals have significant, irreducible costs; (4) the leading approaches to Open Access carry both promise and potential problems; (5) Open Access is a thoroughly international issue, which brings both complications and stability.

In November 2009 the APS Council adopted a formal policy statement on Open Access:

The APS supports the principle of Open Access to the maximum extent possible (called Gold OA); society maintains peer-reviewed high-quality journals, secure archiving, and the Society’s long-term financial stability, to the benefit of the scientific enterprise.

This supports our previous practices and in forms and guides our ongoing policy decisions.

The current broad-focus on Open Access grows from two roots: (1) a sincere public interest in access to the medical research literature, and (2) pressure on acquisitions budgets of research libraries, in large part due to the pricing policies of a few dominant commercial publishers.

One can argue about the in-principle relevance of each of these to physics and to society publishers such as APS, but as a practical matter they set the stage on which we must play.

Public discussions of Open Access sometimes assert that traditional peer-reviewed journals are no longer needed in the age of the World Wide Web or that even if they were needed, they should cost very little to produce, since reference to their time and effort. These claims are seriously in error.

Peer-reviewed journals are, if anything, even more essential today than ever before, especially as a volume of un-curated scientific literature is freely available on the web, refereed journals take on special importance and their publishers perform critical services. This is true not just of the open literature but of what little relevant scientific communities have singled out as sound, significant, and worthy of dissemination and preservation, and improves the papers selected for publication. The importance of peer review is enhanced by the growth of interdisciplinary research and extends not only to the scientific community, but even more so to the general public, whose members have no other basis for distinguishing reliable science from bogus claims. This is most apparent for the medical literature, but closer to home, examples such as climate change come readily to mind.

Indeed the problems that peer review commenting have not yet justified the high expectations surrounding their introduction. The true experts whose comments would be able science from bogus claims. This is most apparent for the medical literature, but closer to home, examples such as climate change come readily to mind.

In addition to managing peer review, publishers provide copyediting and full-text electronic formatting (currently in XML) facilitating electronic linking of referenced scholarship and enhanced search capabilities; ensure archiving; and well-designed, stable online platforms providing seamless access to authors and readers, a hallmark of the literature. APS provides online access to everything ever published in the Physical Review family of journals, back to 1893, a total of approximately 500,000 papers.

Scientific journals represent a remarkable cooperative activity of the international scientific community, and an appreciation for the scale of this activity is essential background for discussions of Open Access. APS publishes ten peer-reviewed journals, which in 2011 received approximately 50,000 papers, with the help of 25,000 volunteer peer reviewers. Roughly 22% of the submissions, 27% of the published papers, and 33% of the referees came from the US. Physics publishing is a thoroughly international enterprise.

In spite of the major contributions from volunteer referees, peer-reviewed journals on the scale of ours are still costly to run. APS’s membership of 19,000+ editors, authors, and reviewers, the office has a staff of 150, including 50 full-time PhD editors, maintains three geographically distributed, fully-mirrored data centers, and provides approximately 16,000,000 full-text downloads of papers every year. We have taken major strides to reduce expenses, such as moving to all-electronic operations and transferring our XML composition and copy-editing to highly efficient vendors, but excellent editors and editorial support staff, an excellent editorial group, and the physical infrastructure to support them form the core of our publishing operations and generate expenses that come to nearly $380M per year.

These costs are now covered (primarily) by subscriptions from libraries in universities, colleges, and research organizations. Although this provides access to APS journals for a very large fraction of active researchers, it does not cover members of the general public, whose taxes help to support scientific research all over the world. It can also present barriers for researchers at smaller educational institutions and at high-tech companies, even though APS uses a tiered subscription pricing system, with prices keyed to an institution’s level of research activity and journal usage, and a factor of approximately 2.5 between prices for the top and bottom tiers.

Gold Open Access-what does it mean?

The simplest method to provide universal access is so-called Green OA-availability somewhere on the Internet. This could, for example, be on an investigator’s personal website, or on an institution’s website or in a repository maintained by an institution (i.e., an institutional repository), and we will allow the author’s version of the paper, including revisions resulting from the peer review process, to be posted for one year. But this approach has its drawbacks, as it presents a very large fraction of active researchers, it does not cover members of the general public, whose taxes help to support scientific research all over the world. It can also present barriers for researchers at smaller educational institutions and at high-tech companies, even though APS uses a tiered subscription pricing system, with prices keyed to an institution’s level of research activity and journal usage, and a factor of approximately 2.5 between prices for the top and bottom tiers.

Gold Open Access is significantly more complex.

By Joseph Serene and Gene Sprouse

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