AIP|Matters Monday, September 28, 2009

Director's Matters

Good science shapes our future

With Congress back in session after its summer break, our lawmakers face an ambitious agenda that includes passing the annual appropriation bills and also tackling several pieces of historic legislation noteworthy for their significance to science. Debate on bills aimed at improving health care, developing new sources of energy, and mitigating climate change will be lively to say the least—both within Congress and within the media. Scientific research will continue to play an essential role in providing new solutions to these problems and to most social and political issues plaguing our nation and countries around the world. In reading the September 11, 2009 issue of *Science* magazine, I was reminded of key contributions that basic science can bring to solving the world's problems.

In the lead editorial, Bruce Alberts, the editor-in-chief of *Science*, calls for an increased emphasis on cancer research at the cellular level. If we can discover the fundamental mechanisms that go awry when cells mutate and transform from normal to cancerous, then we may seed new therapies, says Alberts. Major funding agencies should consider broadening the scope of cancer research by increasing funding for fundamental studies aimed at finding better cell cultures and discovering new model systems, like bacteria and mice—basic tools that would broadly enhance the whole enterprise of cancer research. In the same issue, a group of scientists at Cornell and National Research Council Canada [N. M. Gabor et al., *Science* 325(2009)1367-1371] reported on the unique electrical properties of carbon nanotubes. These entities, slender tubes of carbon atoms only several atoms across but of arbitrary length, are being studied as models for understanding how matter functions at atomic scales and for applications in electronics and mechanical structures. The group uncovered a very efficient means of generating electrical current within the nanotubes upon their exposure to light. Such photo current mechanisms are responsible for energy production in solar cells, and this discovery could mean significant efficiency enhancements over existing silicon-based cells. The discovery is far from commercial application, but it is an example of a serendipitous result from a fundamental study of the physics of nanomaterials. Basic studies in all of the sciences are the seed corn for new technology—a fact often overlooked by the natural tendency for the capital resources of commercialization to migrate to market-ready products.

To cite a third example of what basic science can offer to solve the world's problems—and one that clearly demonstrates the globalization of science—an international group of atmospheric scientists [C. Frankenberg et al., *Science* 325(2009)1374-1377] has published an important series of global maps of water vapor in the atmosphere. Even though the presence of water in the near-Earth atmosphere is obvious as we see clouds and feel the humidity, full global measurements of the concentrations and movement of water vapor are lacking. Further, the inclusion of the effects of water vapor in complex climate simulations is absolutely essential, since water is the most active greenhouse gas. These scientists employed a subtle effect that differentiates between the amount of so-called heavy (or deuterated) water in surface water and water vapor to make full use

of satellite mapping. These measurements are an excellent example of the exploitation of an effect well researched in bench studies in chemistry class (isotopic separation) being applied on a global scale.

Within the pages of any number of weekly science publications—*Science*, *Nature*, *Physical Review Letters* or *Applied Physics Letters*, for example—one could identify several scientific discoveries that will likely have important implications for practical problems.

Sincerely,

Fred

Publishing Matters

JCP and *JRSE* cross the aisle in Washington, DC

This combined booth allowed *JCP* and *JRSE* visitors to mingle and view *JCP*'s redesigned journal homepage, experience *JRSE*'s new mobile view, and discuss other recent changes for each of the journals.

Setting a fine example near Capitol Hill, *The Journal of Chemical Physics* (*JCP*) and *Journal of Renewable and Sustainable Energy* (*JRSE*) "crossed the aisle" to share booth space during the American Chemical Society (ACS) fall exposition in August. Themed "Chemistry and Global Security: Challenges and Opportunities," the 238th ACS National Meeting attracted over 14,000 registrants, with more than 8,000 papers presented in a combined total of 900 oral and poster sessions. During the four-day expo—in which nearly 1500 exhibitors participated—many new features from *JCP* and *JRSE* were on display for booth visitors, including *JRSE*'s new mobile view and enhanced content and a new design for the *JCP* website. A preconference e-mail to *JCP* authors brought out longtime supporters as well as newer *JCP* authors interested in learning more about exciting new directions for the journal. *JRSE* was well represented at the newly introduced "Green Pavilion" in the expo's special events section—nearly 500 attendees signed up to receive the bimonthly *JRSE News*. Visitors received a *JRSE*-branded USB drive, containing the first three issues of this popular newsletter.


JCP editor Marsha Lester discusses journal developments with *JCP*'s newest associate editor, James L. Skinner of the University of Wisconsin-Madison.

During the ACS meeting, the editors of *JCP* and *JRSE* took the opportunity to meet for planning sessions. *JCP*'s editor, Marsha I. Lester of the University of Pennsylvania, gathered the associate editors present for a discussion of recent events—such as eliminating color-printing fees and providing free online access to the Communications section—along with future plans. In another meeting, *JRSE* coeditor John A. Turner, of the National Renewable Energy Laboratory, convened the attending associate editors to discuss the journal's success in attracting exciting research papers and some special topic sections in the pipeline, including one underway titled "Energy Pathways to a Low Carbon Society." AIP staff at both gatherings expressed appreciation to the editors for dedicating time to interact with members of the journal community during the four-day expo. Keep up with news about AIP-owned journals—such as *JCP* and *JRSE*—via the

AIP journal gateway.

JRSE coeditor John A. Turner (second from right) leads an editorial discussion with associate editors Qiang Sun (left), Marsha J. Lambregts (3rd from left), and Devinder Mahajan (3rd from right), along with AIP staff members, Alison Waldron (2nd from left) and Aravind Akella (right).

Physics Resource Center Matters

SPS recognizes inspiring physics outreach with Blake Lilly prizes

"I want to be an astrophysicist!" exclaimed a seven-year-old girl talking to a graduate-school-bound physics club member during Wooster College's first annual Community Science Day. Wooster College, located in Wooster, OH, is one of five schools recognized with a 2009 Blake Lilly Prize. These annual awards, established by the parents of the late Blake Lilly and given in his memory, recognize SPS chapters and individuals who make a genuine effort to positively influence the attitudes of schoolchildren and the general public about physics. The four other 2009 recipients are Angelo State University, San Angelo, TX; Brigham Young University–Idaho, Rexburg, ID; Juniata College, Huntingdon, PA; and Ohio Wesleyan University, Delaware, OH.

Angelo State University SPS members demonstrate a grain elevator explosion at a family science night activity in Santa Rita, TX.

Around AIP

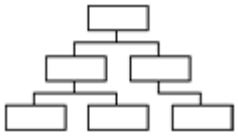
National Preparedness Month

September is National Preparedness Month, which is sponsored by the Ready Campaign. AIP is proud to have partnered with businesses and organizations around the country as members of the National Preparedness Month Coalition. The coalition encourages businesses to share preparedness information with their customers, employees, and local communities.

With hurricane season upon us, it is time to think about some basic ways to prepare at home for an emergency situation. When we talk about basics, we should think of water, food, and warmth. Ideally, to prepare for a wide-scale emergency such as a hurricane, you should set aside in a cool, dry place a three-day supply of nonperishable food (don't forget to include a can opener!) and one gallon of water per person per day (for drinking and sanitation). Include a sleeping bag or warm blanket and a change of

clothing for each person. Gather important documents, such as copies of your insurance policies, prescription medication information, and personal identification and put them in a watertight zipper storage bag. Have a portable radio and flashlight ready along with extra batteries (or use a hand-crank model such as the one AIP gave to employees last year) and include a few simple tools such as a wrench, a pair of pliers, and a hammer (to perform simple repairs or turn off utilities if necessary). More information, including an emergency supply kit checklist and a family emergency plan template, is available on the Ready website.

Who we are—AIP Child Care Center, Melville, NY



Led by Director Linda Castellanos and Assistant Director Iris Amador, the AIP Child Care Center in New York (see page 55 of the organizational chart) has been in operation for 15 years—the first 5 in the Woodbury location and the past 10 in Melville. Licensed for operation by the New York State Office of Children and Family Services, the center can accommodate up to 29 children. The center's primary responsibility is the care and early education of the young children of AIP staff in the publishing facility. When space permits, the center also cares for employees' grandchildren, nieces, and nephews. The center has three rooms, each with two teachers. The infant nursery is equipped to care for infants from 6 weeks of age through 18 months. Children from 18 months to 3 years take part in the toddler program, and care continues until the children are ready for kindergarten in the preschool program.

From the left: (back) Margaret Guiliano, Janet Siraco, Juliet Castellanos, and Linda Castellanos; (front) Alexandra Bennis, Shannon Lewis, and Iris Amador.

We invite your feedback to this newsletter via e-mail to aipmatters@aip.org.

For past issues of this newsletter, visit the AIP Matters archives.