It's a bird! It's a plane! It's PHYSICS!
Society of Physics connects with kids at superhero event

The young and the young at heart leapt tall buildings in a single bound to get to Changing Hands Bookstore on February 28th. The attraction? A day long superhero-themed event featuring story-telling, dress-up, and exhibits. Among the most popular displays were those created and facilitated by students from ASU's Society of Physics Students (SPS). SPSers Bryan Dukes, Michael Young, Rebekah Theisen, and Louis Maizy were invited to talk about the physics behind such superhero staples as invisibility, holographic imagery, and Magneto-ism.

In the holographic demonstration, a small statue of a pig was placed atop a parabolic mirror and covered with another parabolic mirror containing a hole in the center. The placement of the mirrors caused a hologram of the pig to appear above the hole.

A faculty review committee judged Farrell's dissertation prospectus one of the very best from the large number of submissions received. The fellowship includes a $17,000 stipend and tuition award.

ASU Physics Chair Robert Nemanich has been elected Fellow of the Materials Research Society. The honor recognizes scientists whose "sustained and distinguished contributions to the..."
Superheroes...

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curious at the kids - a learning experience for young and old. It was also a learning experience for the ASU students. Maizy was able to see learning patterns of small children, noting that the children appreciated the

more visual demonstrations that required interaction and seemed to grasp concepts more readily when they could touch the concept.

SPSers agreed that the experience was fun and one they would definitely do again. And they likely will...Michael Young’s mother has already booked him for a similar demonstration at the Children's Museum in Evansville, Indiana.

"It was great to have the opportunity to educate the public on something we are passionate about," Maizy says.

Special thanks to Louis Maizy and ASU Physics Laboratory Manager Tim Cook for preparing the demonstrations for this event. For more information on the Society of Physics Students please visit

CBP to host two spring workshops

The Center for Biological Physics (CBP) will host two workshops this spring.

BioPhest 2009 allows Arizona scientists with an interest in biological physics the opportunity to meet for a day of presentations and lively discussion. The event, coordinated by ASU Physics students Ashley Kibel and Sebastian Sandersius, will take place on May 2 in the Bateman Physical Sciences Building, F-wing, Room 123. For more information, click HERE.

The CBP will also host three-day workshop titled Proteins and Water at the Four Points Sheraton, May 10-13. The workshop will focus on the dynamic and thermodynamic properties of the protein-water interface and the influence of the particular hydration structure of solvated proteins on their biological function. CBP faculty Arjan van der Vaart and Dmitry Matyushov have organized the workshop with support from the Biodesign Institute and the College of Liberal Arts & Sciences. For more information, click HERE.

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Global competition drives nanoscience program

With the global economic and technological landscape changing in dramatic and unprecedented ways, the United States' position at the top of the innovation pyramid grows increasingly tenuous. As Thomas Friedman illustrates in the *The World is Flat*, success will come to those who are willing to reinvent themselves in the workplace and keep up with the changing needs of the global economy. With the rapid evolution of new fields, this is no easy task. It requires life-long learning, flexibility, and drive.

Dr. Rita Colwell, former director of the National Science Foundation and Distinguished University Professor at the University of Maryland and the Johns Hopkins Bloomberg School of Public Health, argues that Professional Science Master's (PSM) degree programs may contribute to U.S. leadership in innovative products and services while helping the individual reorient themselves in the global marketplace. Colwell chaired a National Research Council committee that produced the 2008 report *Science Professionals: Master's Education for a Competitive World* in which the need for PSM programs was outlined. She summarizes the committee's PSM recommendations and references ASU Physics' PSM in Nanoscience in the March issue of *Science*.

The Professional Science Masters in Nanoscience degree program at ASU is a joint program between ASU Physics and the Department of Chemistry & Biochemistry that began in the Fall of 2008. The pilot year of the program involved two student and will grow to 12 students for the Fall 2009 semester. Students come into the program with extensive backgrounds in the fields of physics, chemistry, biochemistry, nanotechnology, chemical, biochemical, electrical and materials engineering. Some of the students are mature professionals working in the field as contractors, engineers, researchers, teachers, and laboratory managers.

The program not only attracts working professionals looking to retrain into nanoscience and nanotechnology, but also those who have just completed their undergraduate or master’s degree in a traditional academic program/discipline. These younger students seek to broaden their experience through the multidisciplinary coursework in the PSM program; coursework that combines physics, chemistry, engineering and the life sciences. Especially important is the emphasis on issues related to society and industry including courses in innovation management and intellectual property.

The PSM program has been adopted by over 60 colleges and universities nationwide. According to the National Professional Science Master’s Association (NPSMA), a total of 551 degrees in were awarded in 2008. The American Recovery and Reinvestment Act of 2009 signed by President Obama on February 17 directs $15 million
Physics Flash welcomes your feedback. Please send your comments, questions, and story suggestions to phyflash@asu.edu.

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From the Chair...
March Meeting 2009

The annual March Meeting of the American Physical Society is a unique gathering of over 7,000 researchers, teachers, students, leaders and others interested in or involved with advances of physics. This year’s meeting was held during the week of March 16 in the new convention center in downtown Pittsburgh. The city center is cradled between the Allegheny and Monongahela Rivers and their junction forms the Ohio River. The views across the rivers created a feeling of openness to the city center, and the movement of boats, trains and cars gave a sense of constant motion. On the Sunday before the meeting, the Internet crashed in my hotel, and when I called the front desk, they said they had never previously had such demand on their system. Apparently, the constant motion I witnessed outside was mirrored in the data lines of the hotel!

This meeting is a primary gathering for two of the largest divisions of the APS, the Division of Condensed Matter Physics (DCMP) and the Division of Materials Physics (DMP), as well as several other divisions, topical groups, and forums – all of whom play important roles in organizing the sessions.

The March meeting is a great opportunity to learn of difficult to find a seat. I enjoyed meeting colleagues from Europe and we discussed using Raman scattering to characterize the atomic vibrations of the carbon atoms and how the atomic motion couples to the electrons.

The iron arsenide compounds have been termed iron pnictides, and results have shown that they exhibit a superconducting transition at relatively high temperatures. Again, there were many sessions on this topic throughout the meeting with talks ranging from preparing and characterizing the material to understanding the superconducting properties.

There were numerous topics that captured my interest from quantum effects in nanoscale capacitors to electron spin based electronics to plasmon electromagnetic waves in nanostructures. I also took the time to appreciate a few biophysics talks along with sessions on biosensing. It was particularly impressive to see how concepts and approaches transcend biological materials and hard materials.

There was an important new theme that has emerged from discussions on future directions. The APS has started organizing a new topical group on Energy. There was so much initial support for this area that it is certain to be the new ‘hot’ area in the future meetings.

It was a pleasure to see that so many of our ASU colleagues and students had significant contributions at the meeting. We are so busy at home that sometimes these meetings provide the best time to...
most recent challenges and advances, and to meet our colleagues from around the world. It is invariably different for each of us as we move from session to session to hear the talks that will inspire new research or expand our knowledge in our own area of interest. With about 40 simultaneous sessions scheduled continuously from 8:00 am to 5:30 pm with only a few short breaks, there is always something to learn. It is truly an exhausting, but exhilarating experience.

From my perspective the ‘hottest’ new topics were focused on the properties and growth of graphene and a new class of superconducting compounds composed of iron and arsenic atoms. Graphene is the name given to a single layer of carbon atoms arranged in the form of one of the layers of graphite. The atoms form an hexagonal array and theoretical results have predicted that electrons could move through the ‘lattice’ with a nearly zero effective mass.

Researchers have suggested that graphene could be the next important material in future electronics. It seemed that there were always two or three sessions on the topic and the rooms were often so full that it was catch up with our colleagues from the next office or next building.

For many of us, the evenings offered time to meet with colleagues, students and friends. The sometimes difficult challenges of learning physics and the truly special moments of discovery in research build a basis for lasting friendships.

This was a truly exciting meeting with new topics and important challenges that clearly displayed the diverse and bright future for physics. I recall one of my colleagues asking whether I would again choose to study physics. My response: yes, without a doubt.

Robert J. Nemanich
Chair & Professor of Physics

In the next issue...
Reflections on the Origins symposium, SPS conference, book reviews, and more news from ASU Physics!