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Highlights

from the 128th AAPT National Meeting

AAPT traveled to Miami Beach for the 128th National Meeting. Warm and sunny Florida was a nice treat for many meeting attendees whose homes were being blasted by icy winter weather. Several people who originally intended to stay only for weekend workshops ended up registering for the meeting after they were unable to get home due to the ice storm that blanketed North Carolina. Attendees could stroll on the beach or sit around the hotel pool between sessions to "catch a few rays."

In addition to the warm weather, the approximately 1,000 participants who registered for the meeting were drawn by the excellent program that included invited and contributed paper sessions, poster papers, workshops and tutorials, and plenary or ceremonial sessions.

Many of those attending the meeting volunteer their services in support of the association and the greater physics community by serving as a section representative or by serving on one of the association's many committees. In addition to attending the physics programs, attendees had sufficient time to visit with 46 exhibitors in the exhibit hall and to meet with friends and colleagues in the pleasant atmosphere provided by the Radisson Deauville Resort Hotel.

AAPT Provides Structure for Advances in Physics Education

Much of the role of creating a strong meeting program and examining issues of importance to the physics community rests with the AAPT Area Committee chairs and the 18 Area Committees. Both the outgoing and incoming chairs from many of the committees met on the Saturday prior to the AAPT meeting. President-elect Jim Nelson and Vice President Dick Peterson reviewed and discussed the responsibilities of the Area Committee Chairs, much of which is outlined in the Area Chairs Handbook (<http://www.aapt.org/Directory/handbook.cfm>).

Each of the Area Committees met one or more times during the meeting to plan programs, discuss policy issues and long-range planning, and formulate suggestions that could be taken back to the Council and Executive Board. In addition to the Area Committee meetings, there were more than 20 other meetings of the various standing and program-related AAPT committees.

The AAPT Section Representatives met on Sunday evening to elect new officers and discuss issues of concern to the sections and general membership. The AAPT Council, consisting of the Section Representatives and Executive Board, met on Monday evening to hear reports from the officers of the Association and to recommend future meeting sites for the summer and winter meetings. The Council recommended to the Executive Board that the 2005 Summer Meeting be held at the University of Utah

and the 2008 Winter Meeting be held in Baltimore, Maryland. Sites under consideration for the 2006 Summer Meeting include Syracuse University and Ohio State University. A list of meeting sites and dates can be found on p. 53.

Many Take Advantage of Workshop and Continuing Education Opportunities

More than 330 registrations were received for the 31 AAPT workshops and three tutorials that were offered during the two days prior to the paper presentations. Physics concepts taught using computer-related technologies such as "Video-based Motion Analysis: The Basics and Beyond," "Enhanced Data Analysis in Labs and Problems," "Active Learning with RealTime Physics," "Interactive Lecture Demonstrations and the Physics Suite," and "Using Digital Libraries to Access and Share Physlet-based Curricular Material" were featured in several of the workshops. These workshops were held off-site at Miami-Dade College-Wolfson Campus to reduce the cost associated with providing hands-on computer experiences.



Meeting attendees enjoy refreshments while viewing SPS student poster presentations at the AAPT/SPS reception.

Many workshops presented pedagogical techniques for engaging students and providing innovative opportunities to learn specific subject matter such as the workshops "Teaching Physics with Magic," "Thermodynamics—The Tarot of Physics," "Castle Core Curriculum Electricity Workshop," and "Teaching Quantum Mechanics Through Stern-Gerlach Spin $\frac{1}{2}$ Experiments." Many of the lessons learned through physics education research (PER) were evident in workshops such as "An Introduction to Standardized Assessment Instruments for Novices," "Improving the Introductory Astronomy Survey for Non-Science Majors Through Active Learning," "Preparing Pre-

College Teachers to Teach Physics by Inquiry,” and “TIPERS (Task Inspired by Physics Education Research).” An additional 10 commercial workshops rounded out the many educational opportunities for meeting participants.

The Paper Sessions

The meeting offered 119 invited papers, 181 contributed papers, 63 poster papers, and two crackerbarrels that were organized into 65 sessions over the three-day meeting. Approximately one-half of the poster papers were displayed in the exhibit hall each day on Monday and Tuesday from 8:00 a.m. to 5:00 p.m. The poster paper authors were available to discuss the papers each morning and afternoon during the break in paper sessions. AAPT and SPS hosted a Sunday evening reception prior to the welcome reception during which 10 SPS student posters were displayed.

A popular choice for many attendees was any session involving the use of the web or computer applications in the classroom and laboratory. Typical examples were sessions with titles such as “Enhancing Physics Learning in Lecture with Interactive Lecture Demonstrations,” “Best Practices and Resources for Teaching with Technology,” “Computer Technology in Undergraduate Physics Teaching,” “Just-in-Time Teaching (JiTT),” and “Teaching in a Laptop (or Computer-Rich) Environment.”

Well-attended sessions of a topical interest included sessions with titles such as “Trends and Developments in Teaching Modern Physics,” “Atmospheres and Oceans of the Outer Solar System,” “Innovations in Teaching Astronomy,” “Physics in Living Systems,” “Photon Quantum Mechanics” and “Teaching Biological Physics.”

A well-attended session was the session on “My Life as a Scientist” that included talks by female physicists such as Esther Conwell and Mildred Dresselhaus. Several other sessions that featured careers of women scientists included two sessions titled “Florida Women in Physics,” “Latin American Women in Physics,” and “Women Leaders in Physics.”

A number of sessions were devoted to pedagogical issues such as sessions entitled “PER-Based Physics on the Web: Different Approaches,” “Teaching Physics Concepts,” “PER: Homework and Exams,” and “PER: Understanding Student Thinking.” Undergraduate students engaged in outreach and physics research were featured in two sessions of contributed papers organized by the Society of Physics Students and two sessions titled “Putting the High into High School Physics: High Energy

Physics Projects for Students” featured talks about particle physics projects for pre-college students. The increased interest of the physics education community in the preparation of future teachers could be seen in sessions titled “The Impact of NCLB Legislation and High-Stakes Testing on the Teaching of Science and Teacher Preparation,” “Identification of Critical Factors in Preparing K-12 Teachers,” “Training Elementary School Teachers to Teach Science,” “Teacher Training and Certification,” and “PER: Teacher Preparation.”

Abstracts for the 2004 AAPT Winter Meeting (as well as the 1998-2003 AAPT Winter and Summer Meetings) are available online in a searchable database (<http://www.aapt.org/AbstractSearch/>).

Awards and Plenary Sessions

The AAPT awards program provides a formal opportunity to recognize distinguished physicists and give them a chance to describe and promote their work. Lene Vestergaard Hau, Harvard University, received the Richtmyer Award. Hau’s Richtmyer Memorial Lecture, “Light at Bicycle Speed—and Slower Yet!” discussed how light pulses could be stored in excited states of a Bose-Einstein condensate of sodium atoms for a finite length of time. The light pulse is compressed by a factor of more than 100 million and is completely contained within the atom cloud. The pulse can subsequently be regenerated without a loss of information stored in the pulse. The

Richtmyer Award is given in memory of Floyd K. Richtmyer and the recipient presents a major address on a topic of current significance suitable for non-specialists.

Lawrence Krauss, Case Western Reserve University, was awarded the Oersted Medal, AAPT’s most distinguished award. In a very entertaining lecture entitled “A State of the Universe Address,” Krauss reviewed recent revolutionary discoveries in cosmology that have resulted in the demise of the 1980’s standard cosmological

model. The emerging cosmology of the 21st Century is one in which perhaps 70% of the universe consists of some unknown dark energy, the expansion rate began accelerating about 5 billion years ago, the geometry of the universe is “flat.” Krauss then used some basic concepts of physics to argue that life cannot persist forever in our universe. The Oersted Award recognizes notable contributions to the teaching of physics.

Robert Beck Clark, Brigham Young University, received the Melba Newell Phillips Award, which is given occasionally to AAPT leaders who display a truly unique



Prominent female physicists gather after a session at the Miami Beach meeting. From left to right: Mildred Dresselhaus, Judy Franz, Myriam Sarachik, and Helen Quinn.

life of creative leadership, dedicated service, and exceptional contributions. In his remarks, Clark shared with the audience seven lessons that he has learned during his career as a faculty member at the University of Texas, Texas A & M, and Brigham Young University. Two of these that require no further explanation are: "Listening: The Key Ingredient in Good Teaching" and "All Physics is Either Impossible or Trivial."

Five members of the association were selected for Distinguished Service Citations. The recipients were selected for their many contributions over an extended period of time to the American Association of Physics Teachers and to the teaching profession. Recipients of the 2004 Distinguished Service Citations were as follows: Lila Adair, Piedmont College; Jennifer Bond Hickman, Wellington Management Company; Ruth Howes, Marquette University; James Watson, Ball State University; and Nancy Watson, Ball State University. The citations for these awards will be published in the April issue of *The Physics Teacher*.

Karen Williams, SPS Council President, presented Jerome Long, Virginia Tech, with the Outstanding SPS Chapter Advisor Award. The American Institute of Physics presents this award annually at the AAPT winter meeting to faculty members who have excelled in the role of SPS advisor. Long is advisor of the Virginia Tech SPS chapter.

Two high school teachers received High School Innovation Grants that were awarded by the Committee on Physics in High Schools. Judy Schmidt from Oak Creek High School, Oak Creek, Wisconsin, received \$500 for the project "The Physics Lab of Illusion." Sherry Marshall, from Kirkpatrick Science and Air Space Museum at Omniplex, Oklahoma City, Oklahoma, received \$500 for the project "Catapulting Physics to the Future."

Three excellent plenary sessions contributed to the physics content of the meeting. Seth Putterman, University of California at Los Angeles, presented an overview of the relatively new physical phenomenon known as sonoluminescence in his talk "Sonoluminescence: The Star in a Jar." This phenomenon can be demonstrated with an apparatus costing on the order of \$100, but, according to Putterman, we still do not know which key principle of physics it demonstrates. Ultrasonic energy is focused by a pulsating bubble of gas and produces local heating that exceeds Kirchhoff's law by 15 orders of magnitude and ambient acoustic energy density concentrations by 12

orders of magnitude. The unusual properties of the resulting broadband ultraviolet light that is produced suggests that sonoluminescence originates in a new state of matter.

In her talk "Listening to the Ocean," Maya Tolstoy, Columbia University, discussed how the low-velocity waveguide known as the SOFAR channel (Sound Fixing and Ranging) can be used to record sounds in the ocean that have traveled long distances. The SOFAR channel exists due to changes in the physical properties of sea water with depth and the resulting behavior of sound

waves in the channel is similar to that of light in an optical fiber. Using hydrophones, low frequency sounds are monitored in the Pacific, Atlantic and Indian oceans giving insight into the geological, biological and man-made activities in the ocean.

Jayanth Banavar, Pennsylvania State University, presented a framework for the understanding of the common character of proteins in his talk "Geometry and Physics of Proteins." Banavar demonstrated how the notion of a tube of non-zero thickness combined with geometrical considerations could be used to explain the

structures of folded proteins that are poised at the edge of compaction, accounting for their flexibility and versatility. He then presented an explanation of why helices and sheets are the building blocks of protein structures.

In his presidential address, Charles Holbrow discussed the need for the Association to review its strategic goals and to reflect on the services and rewards for joining the AAPT. One of the primary reasons that most physics educators join AAPT is to receive *AJP*, *TPT* or both. Holbrow emphasized that since both of these journals are now available electronically through library subscriptions, the Association needs to market the many other valuable benefits that are available to AAPT members. (See the Retiring President's Address on p. 8.)

AAPT Hosts SEES

If you wanted to see excitement, curiosity, and enthusiasm, you needed only to visit the SEES session. AAPT again sponsored the SEES (Students to Experience Engineering and Science) program for approximately 120 middle school students. AAPT members Frances Tam, Dan Smith, and Don Frederick along with SPS Director Gary White and Ashley Smith, a former SPS intern, engaged the



Recipients of the Distinguished Service Citations pose with award presenter Chris Chiaverina. From left to right: James Watson, Nancy Watson, Ruth Howes, Jennifer Bond Hickman, Lila Adair, and Chiaverina.

students with demonstration and make-and-take activities.

Gustavo Roig, head of the Minorities in Engineering Program at Florida International University, and David and Christine Vernier provided support for this year's program.

This is the 12th year that AAPT has offered SEESat its winter meeting. The program is organized and coordinated for AAPT by Betty Preece and organizations interested in providing items for students and teachers or assisting with the program costs are invited to contact Preece at bp@snez.net .

Exhibit Show

In addition to the program activities, 46 exhibitors displayed apparatus, books, software, and other materials that can be used in the teaching of physics and astronomy. The exhibit hall opened Sunday at 8:00 p.m. with a Welcome Reception for meeting registrants. The hall was also open during Monday and Tuesday. It was a good place to meet friends between paper sessions or view the poster papers that were changed each day. Refreshments were provided during breaks in the sessions to encourage more attendees to visit the exhibits and posters.

The AAPT Job Fair provided an additional attraction to the exhibit hall. High schools, two-year colleges, and four-year institutions were all represented at the Job Fair. Some

of the position announcements continue to be available online through the Science Job Market <http://www.aapt.org/jobs> .

In Conclusion

The 128th National Meeting offered something for everyone and was a very successful meeting in a location that provided a great escape from the winter weather taking place in many parts of the country.

The many sessions and activities going on in parallel forced participants to make difficult decisions at times, but that is no change from most professional meetings. Events such as the Welcome Reception, First-Timers Gathering, Salute to Physics Luncheon, and Multicultural Luncheon all contributed to the overall success of the meeting.

The 129th National Meeting will be held July 31-August 4, 2004, in Sacramento, California. The call for papers, list of workshops, housing information and registration forms appear in this issue and on the AAPT website. Visit the AAPT website at <http://www.aapt.org> for up-to-date information about all of AAPT's activities.

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