

AAPT Section News

APPALACHIAN SECTION

On a Fall weekend in the Appalachian Mountain, under cloudy foggy skies among glimpses of colorful foliage, the Appalachian Section of the AAPT held its annual Winter Meeting in the beautiful campus of West Virginia Wesleyan College (WVWC), Buckhannon, WV, on October 26 and 27, 2007. Dr. Toufic Hakim, Executive Director of AAPT, who was scheduled to be the featured speaker, could not come due to AAPT business. The meeting was a tremendous success, however, thanks to Dr. Joe Wiest, who worked hard in planning, organizing and arranging for the meeting.

Friday evening activities started with registration and reception in Hyma Auditorium Christopher Hall of Science. A paper titled "Undergraduate Student Research in Physics" was given by Bert Popson, Joe Wiest, and WVWC students. Tours and open house followed for all introductory and advanced labs. The qualities of the research projects and lab instrumentation were impressive.

Saturday morning started with registration and continental breakfast. Greg Puskar was the Presider. Dr. Pamela Jubin Balch, President of WVWC, took time from her busy schedule to welcome the participants. With words of encouragement, she spoke about the importance of science and discovery in the education of students. The invited talks included a Panel Discussion on "Changes and New Missions/Visions of the AAPT." The Panelists were Steve Luzader of Frostburg State University (FSU), Greg Puskar of WVU, Bert Popson of WVWC, and Francis Tam of FSU as the moderator. The other invited paper was "The Diffusion Cloud Chamber Design & Operational Improvements with Laboratory Applications" by Joe Zambelli, President of Zambelli Labs. The contributed papers were as follows:

"Magnetic Study of $Zr_{0.9}Ni_{0.1}$ Alloy", Hailemichael Seyoum, WV State University

"A Novel Experiment for Determining the Half-life of Technetium - 99m" Greg Latta, FSU

"Relevant Labs", Greg Puskar, WVU

"Analyzing Motion from DVs", John Lynch, Wheeling Jesuit University

"Improving Teacher Quality (ITQ) at FSU" by Eric Moore, Katya Dennison, and Francis Tam, FSU

During lunch a business meeting was held. A surprise Distinguished Service Award was presented to Bert Popson by Burt Stumpf, the Distinguished Service Committee, for Popson's faithful and outstanding service to the Appalachian Section. The following officers were elected.

President, Joseph Wiest
WV Wesleyan College
Buckhannon, WV

Vice-President & President Elect, Pam Sharma
WV Northern Community College
Wheeling, WV

Vice-President for High Schools, Sheila Stevenson
Wyoming East High School
New Richmond, WV

Secretary-Treasurer, John Lynch
Wheeling Jesuit University
Wheeling, WV

Section Membership & Recruitment, John Lynch
Wheeling Jesuit University
Wheeling, WV

Past President, Greg Puskar
WVU
Morgantown, WV

The afternoon session consisted of contributed papers. Joe Wiest was the Presider. The papers were as follows:

"Online Physics Teaching Specialization", Dwight Harris, Fairmont State University

"Curriculum Development of Fairmont State's Physics Specialization On-line Courses", Galen Hansen, Fairmont State University

"Using VPython for On-line Classes", Martina Bachlechner, Fairmont State University

"Physics and Art", Burt Stumpf, Ohio University, Athens

"Negative Mass?" George Carlson, WVU Institute of Technology

"Methods to increase Undergraduate Research in Physics and Astronomy", Ken Hicks, Ohio University, Athens

"Structure and Stability of C₂₀ and other Large Carbon Clusters", Majid Sawtari, Bethany College.

The next Fall meeting 2008 of the Appalachian Section will be held in North Community College in Wheeling, WV. Future Appalachian Section Meetings are tentatively scheduled in Bethany College, 2009, Marietta College with Southern Ohio Section, 2010, and Ohio University Athens, Ohio, in 2011.

Francis M. Tam, Section Representative

ARIZONA SECTION

The Arizona Section of the AAPT last met in Flagstaff on April 4, 2008. The theme of the meeting was the Physics of Music. Buzz Delinger, of the Northern Arizona University, gave a talk on the mathematics of music, and Bob Culbertson, of ASU, discussed a conceptual physics of music class that is part of a Freshman Learning Community at ASU. In addition, Mark James of NAU talked about his work on "Optics with a Light Bulb," which came out of a student's question about how a light bulb looks under water. The question led to an interesting consideration of the optics of the various coatings on the inside of a light bulb. The fall 2008 AzAAPT meeting will be in Phoenix at Tempe Preparatory Academy and the Spring 2009 meeting will be in Tucson at Pima Community College. The website for the AzAAPT is www.myeport/published/a/za/home/1/.

Karie Meyers, Section Representative

COLORADO/WYOMING

Fall 2007—Mechanic's Meyhem.

Don Cameron hosted about 15 enthusiastic members of the Denver Area Physics Teachers group, in a meeting co-sponsored by the AAPT CO/WY section. The agenda was action packed and CEUs were available for participants. (The agenda is attached).

Spring 2008—Optics and Electromagnetics Extravaganza

Kurt Miller (PIRA member) hosted a group of about 20 folks at Wheatridge HS, for a share-a-thon on Optics and Electromagnetic topics (The agenda is below). We also conducted our yearly business meeting and elected not just a new Secretary/Treasurer, but also two new Vice-Presidents. One for programs, and one for membership. We're meeting in executive session in early July and may have more to report in Baltimore.

SPRING EXTRAVAGANZA AMERICAN ASSOCIATION OF PHYSICS TEACHERS DENVER AREA PHYSICS TEACHERS APRIL MEETING, APRIL 19, 2008 (approximately 8 AM - 1 PM), Wheat Ridge High School, 9505 West 32nd Ave., Wheat Ridge, Colorado 80033 (On 32nd Ave between Wadsworth and Kipling, access from I-70 Colfax, US-6/6th Ave.)

Please plan to join your colleagues for this program. We already have the following presentations scheduled: * J.D. Birchmeier, Physics Demonstrations with Leftovers * Mike Fuchs, Boulder High School, Student built Loudspeakers * Brian Huang, Ideas from the Science Museum of Minnesota * Steve Iona, University of Denver, Biographies and Heat * Trish Loeblein, Evergreen High School/University of Colorado, PhET simulations for Optics and Electronics * Curt Miller, Demonstrations Galore * Stephen Wallin, CSU-Pueblo, Helmholtz coils—Torque on Magnets

Don Cameron, Section Representative

IDAHO/UTAH

The annual meeting of the Idaho-Utah Section was held March 28-29, 2007, at the College of Western Idaho in Nampa, Idaho. Gary Hunt from Boise State University hosted the meeting. There were 33 registered attendees.

Our meeting was held jointly with the Idaho Academy of Science (IAS), although our sessions were held separately. Activities began Friday afternoon with an oral session and a poster session, followed by a Physics Demonstration Show in the evening. Three more oral sessions were held on Saturday.

Altogether, 19 oral presentations given in four sessions. These included 5 students, 1 high-school teacher, and 11 college and university faculty.

We conducted our business meeting during lunch on Saturday. We elected as vice-president, Steve Shropshire (Idaho State University).

The meeting was concluded with a drawing for door prizes which included various physics "toys". The grand prize was an all-expense paid trip to the national AAPT meeting in Edmonton, Alberta, Canada, July 19-July 23, 2008. The donor providing this prize specified that it be awarded to a high-school teacher who has never attended a national AAPT meeting. The winner was Brett Guisti, a teacher at Lone Peak High School, Highland, Utah.

You can find out more details about the meeting, including photos and videos, at <http://stokes.byu.edu/aapt-idutsec/>.

Harold Stokes, Section Representative

IOWA

The Iowa Section held its fall meeting November 3, 2007 at Simpson College in Indianola, IA. The meeting's theme was "Students Doing Science: A New Level of Engagement" and featured two invited talks, six contributed talks, a 'Short 'n Sweet' session of brief demos, presentations, puzzling pieces of apparatus, etc, lunch at the 'Quantum Café' and a business meeting. President David Olsgaard of Simpson College presided over the meeting.

Larry Schwinger of West Central Valley HS, gave the first invited talk, titled "Scientific Research: Is It Only For Degreed Scientists?" He discussed his methodology of working with students in developing research projects and doing presentations at science fairs. His students have been very successful in reaching international levels of competition. Steve Fuller of Coe College gave the second invited talk "A Four-Year Undergraduate Research Program in Glass Science" in which he described his work with undergraduate researchers over all four years of their college career in grant supported, publishable research. Coe College is a rarity in being an undergraduate institution offering REU positions for students from other colleges during the summer.

The six contributed talks included Bettendorf HS teacher Peter Brueken's "Quarknet at the University of Iowa" in which he discussed his and his students work on the construction of CERN's Compact Muon Solenoid detector. John Zwart of Dordt College spoke on "Improving Problem Solving Skills by Mistake" in which he described how asking students to correct erroneous problem solutions can improve their problem solving skills. Doug Allen of Dordt College presented a four body gravitational interaction simulation which he used in an upper level classical mechanics course in "Earth's 'Other Moon': An Exercise in Computational Dynamics." It uses on-line available JPL data as a starting point for the simulation and allows a comparison of data to the simulation. In "A Short Explanation of the Delayed Choice Experiment,"

Robert Vaughn of Graceland University described an entangled photon experiment. Frank Curti of Simpson College discussed the use of tablet PC's to deliver course content in "Tablet PCs in Physics." In "Physics Activities with Global Warming" Bill Cox of Dowling HS described presentations that he does to a variety of groups on global warming and climate change.

At our business meeting, the following new Iowa Section officers were elected: Wade Sick (Southwestern Community College) is President-elect for 2008. Tom Stierman (Wahlert High School) is Vice President for High Schools for 2008. David Chybda (North Iowa Area Community College) is Vice President for Two Year Colleges, and Todd Pedlar (Luther College) is Vice President for Four Year Colleges. Peter Bruecken (Bettendorf High School) moves from being President-elect to being President in 2007. Current President David Olsgaard (Simpson College) becomes Past President in 2008. Craig Kletzing and Dale Stille were elected to a new joint term as Secretary for 2008-2010, and John Zwart is Section Representative for 2008-2010. We tentatively decide to hold our fall meeting in 2008 at North Iowa Area Community College (Mason City, IA) and 2009 at Coe College. The Executive Committee was given the mandate to meet to discuss ways of improving our outreach, to look at providing CEU granting workshops, and to propose amendments to our constitution to streamline our work in setting up meetings. The business meeting ended with the awarding of door prizes.

Our thanks go to our hosts at Simpson College, David Olsgaard and Frank Curti, for a well organized meeting and to Dale Stille for providing a selection of decommissioned physics lab apparatus free for the taking as well as providing the door prizes.

Fall 2008 Meeting

The Iowa Section held its annual fall meeting November 1, 2008 at North Iowa Area Community College in Mason City, IA with twenty five members in attendance. The meeting featured three invited talks, three contributed talks, a commercial presentation, a liquid nitrogen demonstration show, a business meeting, door prizes and an equipment giveaway. President Peter Bruecken of Bettendorf High School presided.

Andrew Hudson of Monticello High School gave the first talk "High School Teacher Program at CERN" describing his experiences there in a program sponsored by the University of Michigan. Ron Green of

SENSR Co. described his company's products in "Demonstration of a New Acceleration Recorder" and offered reduced pricing for Iowa section AAPT members. Cliff Chancey of the University of Northern Iowa gave the first invited talk "Introducing the Nano-World" and concluded with ways we can incorporate nanoscience topics and activities in our classes. Bill Cox of Dowling Catholic High School concluded the morning's presentations with "Top 10 Bowling Ball Demos" which prompted an impromptu showing of a video (<http://www.youtube.com/watch?v=bwYbX7Hdqbw>) which shows the dangers of releasing a bowling ball from a fast moving car.

After a box lunch, President Peter Bruecken called the business meeting to order. Cliff Chancey of UNI was voted into the office of President Elect and Diane May of Beckman High School was

voted into the office of Vice President for High Schools. Others continue in their offices. We were reminded that next year's meeting will be at Coe College and accepted the invitation to have the 2010 meeting at UNI. A constitutional amendment was approved to change number of representatives on the Iowa Academy of Sciences' committee that nominates teachers for Excellence in Science Teaching awards.

Presentations continued with John Zwart of Dordt College highlighting the types of things that can go wrong in "Adventures in Designing an Experiment – A Cautionary Tale for Students (and Faculty)." Agur Akgun of the University of Iowa gave the second invited talk on the "LHC at CERN." Thomas Stierman of Wahlert High School did an exciting liquid nitrogen demo show. The afternoon's talks concluded with the last invited talk "The Adventure of the Reluctant Collector" in which Tom Greenslade, Jr. described his extensive collection of early physics teaching apparatus. We concluded the day with door prizes and encouragement to take home the give-aways.

Our thanks go to David Chybda, our host at North Iowa Area Community College, and Peter Bruecken for a well organized meeting and to Dale Stille for providing a selection of decommissioned physics lab apparatus free for the taking as well as providing the door prizes.

John W. Zwart, Section Representative

KENTUCKY

The Kentucky Association of Physics Teachers held its fall 2007 meeting in conjunction with the Kentucky Academy of Science, held on the campus of the University of Louisville on November 9 & 10. In addition to the activities and speakers scheduled as part of the Kentucky Academy of Science meeting the KAPT held a business meeting, organized the undergraduate student research competition for physics and astronomy, as well as other oral or poster presentations for faculty and industry researchers. Mr. Kenny Lee, the Kentucky Section's vice-president for high schools was honored by the Kentucky Academy of Science as "2007 Outstanding Secondary School Science Teacher."

The spring 2008 meeting was held on March 1st at Centre College, consisting a brief business meeting and a full day of presentations and share-a-thon sessions.

A New Teacher Workshop is being planned as part of the 2008 Fall meeting, scheduled for October 31 and November 1 in conjunction with the Kentucky Academy of Science on the University of Kentucky campus.

Richard Gelderman, Section Representative

MICHIGAN

During the past year MIAAPT has participated in activities with NSTA and the MSTA. We did not have our usual Fall Meeting, but instead encouraged our members to attend the Regional NSTA meeting in Detroit. The section helped provide sessions for the AAPT Physics Day. Brad Ambrose of Grand Valley State University and Charles Henderson of Western Michigan University did a workshop on PER and our President Mike Faleski hosted a Demo

show with demos provided by several Michigan colleges. The week before our Spring Meeting MIAAPT provided a Make and Take workshop at the state science teachers yearly convention. The workshop was so successful that we have decided to do another next year. We are intending to apply for an AAPT grant to help provide a PTRA New Teacher workshop that will be held in two sessions. One of the sessions will be at the MSTA Convention and the other will follow at our own Spring Meeting. We are hoping to provide 12 hours of in-service using this format.

Our Spring Meeting was held at Western Michigan University and hosted by our incoming President Charles Henderson. Sylvester (Jim) Gates of University of Maryland was our featured speaker. His topic, "Is There a Way to Use Research in Physics Education" can be found on a link at our webpage www.miaapt.org along with photos and information about our other speakers and the format of our meeting. Please check the website to see what we are doing in Michigan.

Alan Gibson, Section Representative

SOUTHEASTERN PENNSYLVANIA

The Spring SEPS/AAPT Meeting was held at St. Joseph's University April 11 and 12, 2008

The Friday night session began with a reception and dinner in the President's Lounge at the Student Union Center at St. Joseph's University. After a delicious dinner we walked over to the Science Center and heard from Gino Segre, Professor of Physics at University of Pennsylvania, on the topic of the Copenhagen Conference, and the early struggles with quantum theory. These were exciting times and controversy reined as the world's best minds in science struggled to understand the structure of the atom. Gino walked us through these sessions as a tour guide giving us a sense of the drama of the topic and the participants. Gino then signed copies of his latest book, *Faust in Copenhagen: A Struggle for the Soul of Physics*.

The Saturday session began at 8:30 with coffee and refreshments and after an introduction and welcome from our President, Fran Poodry, and our host and Vice President, Paul Angiolillo, Don Scholl introduced our Invited speaker, Robert Beck Clark. Robert Clark is part of a very successful physics teacher training program at BYU and discussed the nature of the program and how one university produces 5% of the Physics teachers of America. He also described how the growth in Physics education in the high school will require more, not fewer, high school Physics teachers in the next decade. Where are these new Physics teachers coming from? His wisdom and humor made for a fascinating discussion.

After a short break we began our Contributed Papers session. Members were encouraged to offer a brief demonstration or give a contributed paper on a topic of interest. Our first speaker was Connie Cooper who discussed the growth of Physics education in China and brought us up to date on her recent trip to China.

Next, Marc Baron of Sun Valley HS did a neat demonstration with a laser beam showing how a person pushing on a wall actually deflects the wall a bit. The laser beam and mirror acted like a giant lever, amplifying the movement of the wall.

The next speaker was Barry Feerman, Westtown School, who showed how a motion sensor and volleyball can be used to demonstrate conservation of mechanical energy in six seconds. Participants were asked to predict the shapes of PE, KE, and total energy graphs as the ball made three bounces. This was a lab used for Barry's 9th grade Physics class at Westtown School.

Our next speaker was Jeff Wetherhold, Parkland HS. Jeff has become our expert on home-made video demonstrations and showed some of his newest creations on escape velocity and simulated gravity.

The next speaker was Deborah Goldader, Friends Central School. Deb showed how a plasma state can be made using simple equipment and described why states of matter were an important part of her course. It was fun to see how a fluorescent bulb can be lit up from a simple plasma state toy (without getting shocked).

Our last speaker was Harry Woodcock, Philadelphia University. Harry considers himself to be a theoretical physicist, and discussed some "errors" in textbooks. The title of his talk was "truths not told in physics textbooks."

We next held our annual election of officers. Unlike previous years where nominations were made from the floor, we had a Nominations Committee do the ground work before the election. The nominations submitted were voted in to office, including:

President: Paul Angiolillo (St. Joseph's University)

Vice President: Eldred Jay Bagley (Philadelphia School District)

Recording Secretary: Craig Halpern (Ewing HS)

Corresponding Secretary: Barry Feerman (Westtown School)

Treasurer: Art Zadrozny (East HS, West Chester)

Section Representative (3 year): Ling Liang (LaSalle University)

Web page: Harriet Slogoff (U.Penn) and Martha Takats (Ursinus College)

Members-At-Large: Marc Baron, Doug Vallette, Sardari Khanna, Deborah Goldader, Bob Schwartz, Bill Berner, Jeff Wetherhold

We next presented gifts of appreciation for all of their hard work for many years to John Patane, outgoing Treasurer, and Chet Zach (long-time secretary) of SEPS. Both of these men have held our section together for decades.

We then presented a special award and gift to Bill Berner (U.Penn) for all of the interesting demos he has shown us for years, including his annual and now-famous Christmas show for high school students.

Finally we held our annual door prize "give-away" by the master of give-aways, Bob Schwartz of Harrington HS.

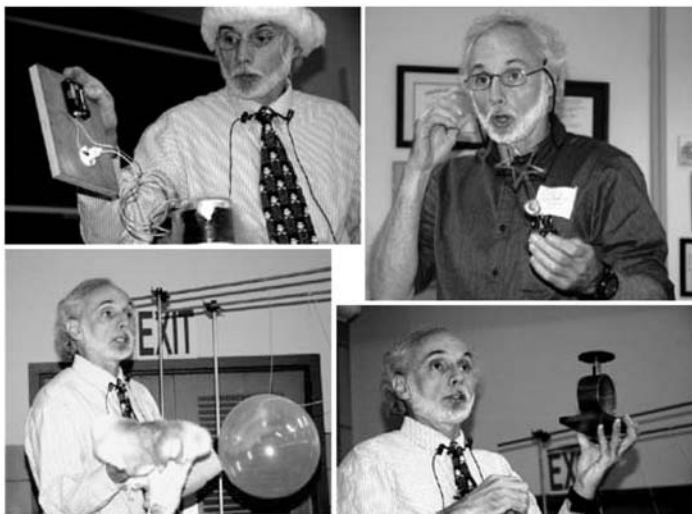
After lunch we had three workshops:

Gravity Workshop led by Don Scholl and Jeff Wetherhold

Participants built lots of cool gadgets including a projectile launcher.

Modeling Workshop led by Doug Vallette and Jess Dykes

Doug and Jess took us through the paradigm of modeling using specific examples from kinematics. They are offering a follow up three-week course in Modeling Physics and Chemistry at Ridley HS this summer.



Bill Berner (U. Penn) was presented a special award and gift for all the years of interesting demo presentations, including his annual and now famous Christmas show for high school students.

College topics: open discussion led by Paul Angiolillo

The day ended well with all of us realizing that there is much to engage us in our profession as teachers. Teachers teaching teachers about teaching is cool.

We also agreed to form some Standing Committees to help run the organization:

Outreach Committee: Fran Poodry

Nomination Committee

Financial Planning Committee

Constitution Committee: update our Constitution

We agreed to hold the next year's Spring Meeting at Villanova University and hope to have it be a joint meeting with the NJ and Central Pa sections.

Our next officer's meeting will take place on May 2, 6 p.m. at St. Joseph's University. Members are welcome to attend and help plan next year's activities.

Barry Feierman, Section Representative

SOUTHERN CALIFORNIA

The Spring Meeting of the Southern California Section was held Saturday, March 29 at Pomona College in Claremont, California. Special thanks to the local host, David Tanenbaum, for arranging the meeting site and to the Pomona College Physics Department for providing coffee, fruit, and pastries. Approximately 40 people attended.

The meeting began with a workshop: "Downloading and Editing Internet Video for Use in a Physics Class" led by Gary Reynolds. The workshop provided hands-on experience searching the internet for useful video clips. Participants learned how to download clips, reformat them for editing, and edit them. Those attending the workshop were able to store their edited clips on flash drives or cd's for convenient use in the classroom.

Dr. Dwight Whitaker from Pomona College gave the morning invited talk "Rapid Motion in the Plant Kingdom: Nature's Weapon's of Mass Reproduction" Dr. Whitaker described how

plants and fungi have developed a number of remarkable methods for the rapid dispersal of seeds and spores and how the most rapid movements come about from the sudden release of stored elastic energy. He showed several high-speed video images of these processes and discussed the biomechanical models developed to isolate the key features required for rapid motion and to assess how effective each plant is at its particular dispersal mechanism. The results of these analyses are combined with observations from the field and comparisons with similar species to gain insight into the adaptive significance of these extraordinary methods of reproduction. He described several methods of seed and spore dispersal from a variety of plant species, including the explosive launch of bunchberry pollen, the slingshot seed dispersal of *Impatiens*, and the exploding spore capsules of *Sphagnum* moss. For more about his work and a sample of his videos, please see <http://www.williams.edu/go/explodingflower/>.

Dr. David Tanenbaum from Pomona College presented the afternoon invited talk "Cornell Institute for Physics Teachers: A Lending Library for Class Sets of Laboratories Designed for High School Teachers" Dr. Tanenbaum's talk concerned the CIPT project, a nation wide resource for high school physics teachers supported by both the NSF and New York State. Libraries exist in several locations around the country, with the largest sites being hosted by Cornell in New York and Pomona College in California. He described the training workshops which are run to introduce teachers to the labs. The high school teachers can either assemble the lab equipment from parts lists, buy it from vendors, or check it out from the libraries. Dr Tanenbaum highlighted some of the laboratories that are available and described the process of teacher training and the development of new laboratories. For more information go to <http://www.cns.cornell.edu/cipt/index.html>.

A special event of the afternoon session was a planetarium show and astronomy software demonstration presented by Dr. Bryan Penprase of Pomona College. He demonstrated some of the available software, including a set of java applets for simulating apparent motions of the stars and planets, a desktop planetarium program with a catalog of 200,000 stars which also enables "fly-throughs" of the solar system and nearby universe, and programs for viewing large assemblies of particle positions which can be used to visualize the largest structures in the universe. Dr. Penprase concluded his presentation with a quick sky show illustrating some of the capabilities of Pomona College's Millikan Planetarium and provided some updates on upcoming events in the sky. The Pomona College astrophysics simulations can be found at <http://galileo.astro.pomona.edu/common/Simulations/>

The ever popular Show 'n' Tell featured demonstrations by Gary Reynolds, Ertan Salik, Forouzan Faridian, and John Mallinckrodt.

The following contributed talks were presented:

"Flight of the Wandering Albatross" Bob Coutts, UCLA
 "Calculus Based derivation of Simple Harmonic Motion" Martin Hoecker-Martinez, Mt. San Antonio College & Harvey Mudd College

"Ion Propulsion Simulation and the NASA Dawn Mission" Joe Wise, New Roads School

"Measuring Relative Phase Shift Incurred Upon Total Internal

Reflection” Ertan Salik, Cal Poly Pomona
“History and Reality of the International Young Physicists Tournament” Tengiz Biblashvili, Wildwood Secondary School

There was a brief business meeting where the PTRAs initiatives and other news from AAPT were discussed and elections were held. The following officers were elected:

President:	Bill Layton
Vice President for High Schools:	Bob Baker
Vice President for 2-year Colleges:	Fred Carrington
Vice President for Universities:	Jeff Phillips
Past President:	Nuria Rodriguez
Treasurer/Secretary:	Forouzan Faridian
Web Manager:	John Mallinckrodt
Section Representative:	Mary Mogge

The meeting ended with our World Famous “Order of Magnitude Contest.” This meeting’s question was: (A variation on an oldie, but goody!) “How many sheets of paper would it take to cover your share of the Earth’s surface?” The answers ranged from 0 to 1058. Alex Small and Dean Papadakis submitted the median entries of 104 and 105, respectively. Alex selected a \$50 gift certificate from Vernier as his prize. Dean chose a GoMotion from Vernier. Door prizes were won by Paul DeVoe (Vernier gift certificate), Marilyn Usher (The Flying Circus of Physics by Walker from Wiley), and Tengiz Biblashvili (The Flying Circus of Physics by Walker from Wiley). We thank our corporate sponsors—Vernier and John Wiley & Sons, Publishers—for their support and donation of door prizes.

The Southern California Section will hold its Fall Meeting in late October or early November. Please bookmark the SCAAPT URL <http://www.scaapt.org/> and check for the date in early Fall.

Mary Mogge, Section Representative



Jim and Jane Nelson led PTRAs workshop for new physics and physical science teachers. The workshop was funded by an AAPT mini-grant awarded to SCAAPT. (Photos Mary Mogge)

PTRAs Workshop and Section Meeting – November 7th & 8th

The Southern California Section (SCAAPT) and the California State Polytechnic University, Pomona, California (Cal Poly Pomona) hosted an all-day PTRAs Workshop for new physics and physical science teachers Friday, November 7th. It was funded by an AAPT mini-grant to the section, one in the first round of workshop grants in 2008. The workshop was led by founding PTRAs Jim and Jane Nelson and attended by 22 teachers in their first four years of teaching physics or physical science. As part of the grant, attendees received a one year trial AAPT membership, a one year SCAAPT membership, a DVD from the Perimeter

Institute, and copies of AAPT publications. During the workshop, the teachers participated in several kinematics laboratory activities. The attendees were all very enthusiastic about the workshop. Some of their comments were “I had a wonderful experience today and thoroughly enjoyed the workshop with other new physics teachers.” “Very fun and information, well worth the time.” “I would love to attend ANY future workshops. Thank you!”

The Fall Meeting of the Southern California Section was held Saturday, November 8 at California State Polytechnic University, Pomona, California. Attendees were welcomed to the meeting by Donald Straney, Dean, Cal Poly Pomona College of Science and Steve McCauley, Chair, Cal Poly Pomona Physics Department. Special thanks to the local host, Mary Mogge, for arranging the meeting site. Approximately 50 people attended. The meeting began with a choice of two activities: Jim and Jane Nelson conducted a sample PTRAs workshop on geometrical optics. Participants received an introduction to the PTRAs program and its materials. Also available were self guided tours of Cal Poly Pomona’s recently renovated teaching and research laboratories. There was a host in each lab to explain its function.

Dr. Peter Siegel from Cal Poly Pomona gave the morning invited talk “Student Projects on a Budget.” Over the past 20 years, Dr. Siegel has sponsored over 50 undergraduate student projects, 15 of which have been published in AAPT journals with student co-authors. He described a number of projects, both theoretical and experimental, that can be carried out with minimal expense and are appropriate for advanced high school to undergraduate college students.

Dr. Antonio Aurilia from Cal Poly Pomona gave the afternoon invited talk “Looking Back in Time: The Role of Fundamental Constants in the History of Physics.” Dr. Aurilia began his talk by briefly describing the latest generation of particle colliders. He discussed the historical attempts to find a theory of the physical processes that took place during the earliest possible time (Planck time $\sim 10^{-44}$ seconds). Dr. Aurilia’s talk combined historical considerations with familiar techniques of dimensional analysis to provide an elementary approach to a theory of the “Planckian superforce” that shaped the universe.



A plaque honoring Harvey Leff’s service to Cal Poly Pomona was dedicated at the meeting. The plaque will be placed in one of Cal Poly’s recently renovated physics labs. (Photo John Mallinckrodt)

The meeting also featured the dedication of a plaque honoring Dr. Harvey S. Leff’s service to Cal Poly Pomona and the AAPT. The ever popular Show ‘n’ Tell featured demonstrations by James Lin-

coln, Harry Manos, John Altounji, Christian Villa, John Mallinckrodt, Gary Reynolds, Mark Helminger, and Ertan Salik.

The following contributed talks were presented:

"A Few Barriers and Facilitators to Learning Physics"

Phillips, Loyola Marymount Univ.

"The Slide Guitar – Physics Meets Music in the Classroom"

Barbara Hoeling, Cal Poly Pomona

"Large Lecture Class Survival"

George A. Kuck, California State University, Long Beach

The meeting ended with our World Famous "Order of Magnitude Contest." This meeting's question was: "What fraction of the Earth's surface is covered by buildings?" The answers ranged from 10⁻²⁷ to 0.325 (26.5 orders of magnitude). Six attendees submitted the median entry of 10⁻⁴. Harry Manos won the run off and selected a GoMotion from Vernier. Door prizes were won by Terrence Kite (Vernier gift certificate), Paul DeVoe and Roger Morehouse (each a book from PTR/AAPT), John Jewett, Jason Kite, Bill McCandless, George Rainey, and Al Sieger (each a book from Wiley). We thank our corporate sponsors—Vernier and John Wiley & Sons, Publishers—for their support and donation of door prizes.

The Southern California Section will hold its Spring Meeting in late April or early May. Please bookmark the SCAAPT URL <http://www.scaapt.org/> and check for the date in early Spring.

Mary Mogge, Section Representative

SOUTHERN OHIO

Spring Meeting

The Southern Ohio Section held our spring meeting on April 26, 2008 at Olentangy High School in Lewis Center, OH (north of Columbus). Between 20 and 30 members were in attendance, including several first-time attendees. Our host, Mary Whalen, produced a well-organized, fun, and educational meeting for us. She had assistance from Jason Cervenec (Thomas Worthington High School) and Doug Forrest (Pickerington High School North).

The day opened with the first of two invited speakers, Bob Brown of Case Western Reserve University (in our neighboring Ohio section) who told us about his method to help students *Revisit, Reflect, Remember, and Really Learn?: The Latest Data on a Cycling Method of Teaching Introductory Physics*. Our second invited speaker was Jim Beatty from The Ohio State University, who explained the work he and his collaborators are doing in Argentina and Antarctica to learn more about *The Highest Energy Particles in the Universe*.

Kathy Harper of The Ohio State University presented a workshop on Jeopardy Problems, and the team of Jason Cervenec and Brian Geniusz from Thomas Worthington High School gave a workshop on lab practica, entitled, Practica with a Purpose.

Jim Sullivan of the University of Cincinnati OMI College of Applied Science contributed a presentation that was an update on some of his ongoing work, entitled, *Physics Assessment Tool – Part II*. We also had a brief *How I Do It* session, coordinated by Doug Forrest. Presentations included one by Minda Wesley of Olentangy Liberty High School on teaching rotational kinematics and one by Doug Forrest about a homework/lab exercise he has students do to measure their homes' levels of radon.

We also elected some new officers. The president elect is Jen-

nifer Blue of Miami University, the new vice-president for high schools is Eric Towers of Summit Country Day School, and our new section representative is Kathy Harper, who will be at Denison University, effective Sept. 1.

On the morning of Saturday May 10, approximately 30 physicists served as judges at Ohio's State Science Day competition to determine the awarding of physics prizes for students in high school and middle school. As he has for many years, Gordon Aubrecht of The Ohio State University coordinated the efforts of judging nearly 150 projects. The prizes are awarded by the Southern Ohio Section of AAPT, with the generous financial support of the Ohio Section of APS.

Also of note is that Fred Reuter, our current president, secretary, and webpage manager, has been updating our website with new features, including past issues of our newsletter, a blog, links to other physics websites, and a listing of educational opportunities. Our new web address is www.sosaapt.org.

Our Fall 2008 section meeting is scheduled for October 11 at Wright State University in Dayton, in conjunction with the Ohio Section of APS. Elizabeth George of Wittenberg University will coordinate the AAPT activities at the meeting.

At the request of the national AAPT, the section is coordinating a strand of physics-related presentations to be offered throughout the day at the upcoming regional meeting of the NSTA in Cincinnati. "Physics Day" will be Friday, December 5.

Fall Meeting

The Southern Ohio Section met at Wright State University in Dayton on Saturday October 11, in conjunction with the Ohio section of the American Physical Society. Elizabeth George assisted in coordinating the AAPT activities at the meeting.

Plenaries were given by Ken A. Dill of the University of California, San Francisco, on "Proteins and Other Foldametric Materials," and Vicki Colvin of Rice University on "Nanotechnology and the Environment: Lessons from and for Solid State."

We had the following presentations in the contributed papers session on education:

Gordon Aubrecht (The Ohio State University at Marion), "Learning What's Hard About Physics By Inquiry's Properties of Matter" and "Working to Have an IMPACT."

Todd Kelley and Mary Kay Kelly (University of Dayton), Beth Basista (Wright State University), "Changing Students' Attitudes About Teaching in a Science Course for Teachers."

James Sullivan and Thomas Cruse (University of Cincinnati), "Hosting a Successful Science Fair to Boost Interest in Science."

In the short business meeting run by president Fred Reuter, we learned that the section now has official tax-exempt status. We also now have an updated database of section members, and a new brochure and membership application. We are also discussing various way in which to reach new members.

NSTA Physics Day in Cincinnati

The Southern Ohio section coordinated a Physics Day strand at the NSTA regional meeting in Cincinnati on Friday, Dec. 5.

Doug Forrest (Pickerington North High School) gave a workshop on Modeling Instruction. He had assistance from his colleagues Mike Dupakoski and Sheri McClarren.

Jim Sullivan (University of Cincinnati) organized a panel of folks

to talk about the University of Cincinnati's extremely successful science fair. Members of the panel, in addition to Jim, were:

Tom Cruse (University of Cincinnati)
Joe Dienger (All Saints School)
Corey Mullins (Turpin High School)
Fred Reuter (St. Xavier High School)
Tom Hale (St. Xavier High School)

Kathy Harper (Denison University) gave an interactive presentation on alternative problem types based on problem-solving research.

Gordon Aubrecht (The Ohio State University, Marion) gave a presentation on the Contemporary Physics Education Project (complete with charts for attendees to take home).

All sessions seemed reasonably well-attended.

Kathy Harper, Section Representative

BRITISH COLUMBIA

Each year the BCAPT aims to hold three one day professional development events. Between October 2008 and August 2009 we partnered with different groups to hold five well attended events. In October we held an event aimed primarily at high school teachers on the province wide professional development day. This is always our largest event (since so many teachers are free to attend) and we are able to offer 6 parallel sessions for about 100 people who attend from across the province of British Columbia. Held on October 19th, 2007 the theme was "Sustainability and Energy: The Physics of Environmental Issues". Workshop activities included: fuel cell demos, fuel car demonstration and green building tours; research talks were about hydrogen fuel cells and climate change. This event was held with the support of Kwantlen University College in Surrey, BC.

In February the BCAPT partnered with the BC Association of Medical Physicists and the BC Cancer Agency to offer a Saturday morning workshop on "Radiation Treatment of Cancer". This event included research talks and a tour of the equipment and facilities used to conduct this research. Careers in medical physics were also featured. About 40 people attended this event on a Saturday, February 23rd, 2008.

Every two years the BC Science Teachers Association (BCScTA) organizes a large science teaching conference called Catalyst. For the second time the BCAPT partnered with the BCScTA to offer a physics strand of talks at Catalyst. From their proposals we chose the physics talks and also held our AGM at this conference. Again this is a large event where teachers receive funding from their school districts to attend. It was held in the interior of British Columbia in Kelowna and we were able to reach some of our members who can not travel to the lower mainland for our regular event. 27 new members joined our organization at Catalyst.

In addition to our partnership with the BCScTA we have also entered into an agreement with the Perimeter Institute to support each others' professional development activities. In March we helped advertise and host a Perimeter Institute professional development workshop on their new Dark Matter teaching resource. We are looking forward to working with the Perimeter Institute in the future.

Finally in August the BCAPT hosted a PTRa workshop after

receiving a \$1200 grant to offer a one day workshop on motion. This workshop was designed to support new teachers in British Columbia with physics topics that are being introduced into the new Grade 10 curriculum this year. Bill Franklin ran the workshop which included many free materials and books. 17 preservice and junior science teachers attended this workshop on Saturday, August 9th, 2008.

The BCAPT is looking forward to another busy year as we start to plan our next big event. In October we will hold our next conference at TRIUMF (a linear accelerator facility) around themes on High Energy Physics and celebrating the opening of the Large Hadron Collider in CERN.

Rachel Moll, Section Representative

MINNESOTA

The spring meeting of the Minnesota Section was held at Macalester College in Saint Paul, Minnesota on April 26, 2008.

The highlight of the meeting was the plenary session, *QuarkNet History: Nationally and at the University of Minnesota*, presented by Bob Peterson of Fermilab and Jon Anderson from Centennial High School in Circle Pines, Minnesota. Bob described the history of QuarkNet as program designed to involve high-school teachers and their students in real scientific research and the beginnings of the University of Minnesota site in 2002. With the help of three of his students, Jon talked about how the program has been implemented at Centennial High School and the impact that it has had on students there. Shane Wood from Irondale High School in New Brighton, Minnesota, joined the group to share some of his QuarkNet experiences and plug his poster presentation. Additionally, an overview of the Cosmic Ray Muon Detectors used by students was given and a description of how the data from these detectors are used as part of an online e-Lab. Other example e-labs from Ligo and CMS were shown.

Wrapped around the keynote address were seven contributed papers and four posters on subjects ranging from biophysics to pedagogical uses of technology. Among other things, participants were treated to a discussion of the construction of biodegradable plastics and dye-sensitized solar cells, the use of finite element methods in parachute modeling, and the properties of solid nitrogen. Three posters and two papers had to be cancelled because the presenters were unable to travel to St. Paul due to a late spring snowstorm.

The best student presentation awards was given to Sarah Anderson and Chad W. Hoyt from Bethel University for their talk, *A low-cost wavelength meter with picometer-level accuracy*. The best student poster award was given to Andrew Nguyen from Augsburg College on *Line tension measurements with lipid monolayers*.

At the business meeting which followed, a discussion of meeting formats took place and elections were conducted. Suggestions were solicited for the program of the fall meeting, tentatively scheduled for October 25, 2008 at Gustavus Adolphus College. For the latest information on this and future meetings, visit <http://www.maapt.org/>

Charles Niederriter, Section Representative

NORTHERN CALIFORNIA/NEVADA

The spring meeting of the Northern California/Nevada Section was held Friday and Saturday, April 18-19, 2008 at Heritage High School, Brentwood, CA.

Friday Afternoon Workshop, 1-4 PM

“Get Hands-On with Vernier’s LabQuest”

Clarence Bakken will present a hands-on workshop in Room B-114 for physics teachers that will explore the use of Vernier equipment for gathering and analyzing data in the physics lab. Learn about LabQuest, the newest tool from Vernier, WDSS, the wireless solution that’s perfect for many applications, and the use of video. Take home sample labs and other resources that you can use in your classroom. Email Clarence for more information (cbakken@mac.com).

Friday Night Social

6:30 – 8:00 Come check out this brand new high school in Dennis Buckley’s home town—little ‘ol Brentwood—you’ll be impressed! Come toast physics with us!

Attention New Physics Teachers! PTSOS is here to help you! PTSOS is an NCN-AAPT-sponsored project funded by a donation from the Karl Brown Foundation that assists physics teachers in their vulnerable first years of teaching. PTSOS is headed by Paul Robinson, Dean Baird, Stephanie Finander. New teachers should email Stephanie Finander at sfinander@sbcglobal.net for more information

Saturday, May 5, Morning Session

9:00 Show & Tell

Share your favorite demonstration or teaching tip. Since new teachers and section members will be at this meeting, you are encouraged to dust off some of your oldies but goodies. If you have handouts, please bring 100 copies. PASCO will present some of their latest products. Time limit is 5 minutes per person. Presenting papers at Show & Tells is specifically discouraged. Beware of the dreaded Gong!

10:00 Invited Speaker

“The Latest Scoop on the LHC”

Beate Heinemann, Lawrence Berkeley Laboratory, BHEHeinemann@lbl.gov

Exploring Nature’s Fundamental Forces and Particles with the Large Hadron Collider

Abstract:

The “Large Hadron Collider” (LHC) is a new particle accelerator currently being constructed in Geneva in Switzerland. It is among the most powerful and largest scientific instruments ever built and will probe the fundamental forces and particles in Nature with unprecedented precision. Starting in summer 2008 proton-proton collisions will take place inside two huge detectors (called ATLAS and CMS) which record the particles produced in those collisions. More than 2000 scientists from all over the world are working on the construction of each of these detectors and will analyze the large data volumes they produce.

Nobody knows what new particles will be found at the LHC

but it is very likely that some revolutionary discovery will be made: among the most likely discoveries are the “Higgs boson” (that will explain the origin of mass), “supersymmetric” particles or extra spatial dimensions as predicted by theoretical models to solve problems in the current model of our Universe. I will explain the big questions the LHC will address, the LHC accelerator and detectors, and outline the experimental methods used to detect new particles and to reveal new laws of Nature.

12:30-12:50 Raffle/Business Meeting: Report from the Officers and other business. Future meetings and dates will be discussed. Paul Robinson will report on the National AAPT business. A motion to allow the Southern Section of Nevada to form their own Section will be presented.

Contributed Papers

1:00 “Why Does Saturn Have Rings and Earth Doesn’t?” Phil Gash, CSU Chico Physics Department, pgash@operamail.com

In short, Saturn’s quadrupole moment is much larger than Earth’s. Salient features of the ring system will be presented along with how Saturn’s girdle or bulge helps stabilize the rings to its equatorial plane.

1:20 “Explaining Hyperspace as Proposed by Lisa Randall and Sundrum” Douglas Leadenham, DeVry University, dleadenh@fre.devry.edu

Giving students a glimpse of new ideas in physics keeps them involved and keeps instructors focused. Explaining Randall-Sundrum theory was not as hard as one might think, but even better was finding that the so-called Compton wavelength is a misnomer. We get the Compton result in special relativity by explaining scattering of photons and electrons. The thing we call the Compton wavelength, h/mc , has the name because of its resemblance to the de Broglie wavelength, h/mv or h/p . That is as close as the resemblance gets, because the de Broglie wavelength is a variable, depending on the particle’s momentum, while the Compton wavelength is a constant property of a particle. Moreover, this confirms the Randall-Sundrum theory.

1:40 “Advances in Advanced Labs”

James M. Lockhart, San Francisco State University, lockhart@stars.sfsu.edu

An AAPT Advanced Lab Task Force (including local member Darryl Preston from CSU East Bay) recently submitted its report to the AAPT Executive Committee. The report recommended ways that AAPT could increase the degree and effectiveness of efforts to improve the teaching of advanced laboratories. An advanced labs topical conference is being planned for the Summer, 2009, AAPT meeting. Finally, the Advanced Laboratory Physics Association (ALPhA) was recently formed in order to promote the sharing of knowledge and experience among advanced lab instructors. Upgrades to advanced lab programs at local universities, including San Francisco State, UC Berkeley, and Stanford will be discussed.

2:00 “A Biophysics Experiment for the Advanced Physics Laboratory”

Thomas Colton, UC Berkeley, tcolson@berkeley.edu

A new experiment, Brownian Motion in Cells, allows students to use modern particle tracking techniques to investigate Einstein's model of random motion due to thermal energy and compare this motion with intracellular transport by motor molecules in a living cell. Students observe gold and polystyrene beads, 200nm-2 micrometers in size, suspended in liquids on an inverted microscope. They analyze the images from a CCD camera to measure particle trajectories and calculate squared displacements and a diffusion coefficient. They investigate the effects of particle size, fluid viscosity, and solvent molecular weight on particle motion. Students then examine cytoplasmic streaming in onion cells, mapping the intracellular highways along which small granules are transported by myosin motor molecules. Particle velocity distributions and the relative roles of directed transport and Brownian motion can be inferred. The particle tracking software is highly automated, and students add algorithms in the C# code to improve the performance and learn how image processing works. The lab write-up, documentation, and software are posted on our Wiki at <http://www.advancedlab.org>.

2:20 "A New Look at the Bouncing Ball" Tim Erickson, Epistemological Engineering, tim@eeps.com

A microphone can be used to record a bouncing ping-pong ball. Then we'll use the sound to figure out the coefficient of restitution, see whether that coefficient really is constant, and put all of it together for pre-calculus students so they can see a practical application for summing infinite geometric series

2:40 "Extending Critical Thinking Beyond the Classroom" Dean Baird, Rio Americano High School, dean@phyz.org

Suppose our students leave our classes with the knowledge that the kinetic energy of an object is . And supposed they take that knowledge home where they prepare some nice homeopathic remedies to consume amid their feng shui-arranged furniture while they search for clues to their future at www.psychicfriends.com. As a science teacher, I would fear we had done something wrong. So I developed some mini-lessons focusing on critical thinking and skepticism as it applies to the world beyond the classroom. Student worksheets will be shared, as will references to corresponding web video and presentations. You'll laugh, you'll cringe, and you might even want to slip some of these lessons into your curriculum.

3:00 "Newton's Laws Poster Set"

Kevin John, Sonoma State University, johnk@universe.sonoma.edu

A set of posters were designed by the NASA E/PO office at Sonoma State in support of the Swift project. A brief review of the scientific concepts of the mission and a short discussion on in-class activities to assist educators in teaching these concepts will be presented. An online version of the posters can be viewed at <http://swift.sonoma.edu/education/index.html>

Dennis Buckley, Section Representative

NORTH CAROLINA

The NCS-AAPT met jointly with Zone 5 SPS at Davidson College in Davidson, NC on April 4-5, 2008, for the 13th Annual Spring Meeting of the Section. Guest speakers included N. David Mermin who spoke at the banquet on "The Geometry of (Flat) Spacetime" and Susana Deustua who spoke on "The Supernova Acceleration Probe (SNAP) Project" as well as presenting a workshop on comPADRE.



Susana Deustua presented a workshop on comPADRE.

There were 65 attendees including 19 high school students and teachers whose registration costs were partially covered by the SHODOR Foundation, a special grant from Davidson College's Dean of the Faculty, and the Mary Creason Fund. Other sponsors included AAPT, the Society of Physics Students, North Carolina State University, Pasco, Prentice-Hall, Spectrum Techniques, Vernier Software and Technology, and John Wiley and Sons.

There were a total of 18 papers and two workshops presented. The following prizes were announced:

Best Graduate Student Paper (Fall 2007)

"Is 'Clicking' Thinking? Using Clicker Sequences to Investigate Student Use of Deductive Reasoning" by Shawn Weatherford, North Carolina State University

Best Undergraduate Student Paper (Fall 2007)

"Flaw Detection through Nondestructive Means in Flex Hoses" by George Hall, Elon University

Best Pedagogical Paper (Fall 2007)

"Is 'Clicking' Thinking? Using Clicker Sequences to Investigate Student Use of Deductive Reasoning" Shawn Weatherford, North Carolina State University

The following two awards are presented at irregular intervals and were both presented at this meeting:

The Walter C. Connolly Award for Teaching at the Pre-College Level was presented to Sam Wheeler, William G. Enloe Magnet High School

The NCS-AAPT has established a new award at the Two-Year College level: Award for Outstanding Teaching and Service at the Two-Year College Level

The Award has been established to reward excellence in both

teaching and service at the two-year college level in North Carolina. For consideration, a nomination letter, as well as two supporting letters detailing the nominees teaching and/or service at the two-year college level, must be sent to the Section Representative or the Secretary-Treasurer. Recipients receive a certificate, a cheque for \$300, a one-year membership in the national AAPT, and donated items from sponsors.

Bo Wessel is the first recipient. Hereafter the TYC Award will be known as the Conrad “Bo” Wessell Award for Outstanding Teaching and Service at the Two-Year College Level.

Citation: For his long and fruitful career marked by service to the cause of physics education in general, and to the NCS-AAPT and the two-year college community in particular, the North Carolina Section of the American Association of Physics Teachers is proud to announce Conrad “Bo” Wessell as the first recipient of the NCS-AAPT two-year college award.

We received a note of appreciation from AAPT for our donation of \$1000 for the Physics Teachers Recognition Day, which was very successful.

Our next meeting will be a joint meeting with SESAPS and the SPS at North Carolina State University on October 31st – November 1st 2008.

Our hosts from the Physics Department included Larry Cain, Mario Belloni, and Tim Gfroerer with the able assistance of Nancy Brown and students from the department.

John Hubisz, Section Representative

CHICAGO

The Chicago Section held its Fall meeting on Saturday, November 8, 2008 at Crystal Lake South High School, with more than 40 section members participating. Scott Beutlich was our host for the day, and started off the meeting with some of his favorite waves demonstrations, including a Rubens’ Tube (vibrating to the National Anthem) and we all played some songs on Scott’s set of ‘palm pipes’. The contributed papers spanned a broad range of topics and times, from “Woman of the Enlightenment—Emilie du Chatelet”, to “Using the new nTIPERs in the high school classroom”.

Our invited speaker was Dr. George Lisensky of Beloit College, who spoke about and demonstrated “Resource materials for nanoscale science and technology education”. (We were all very careful to not drop—or to trap on the magnet, the neat sample of FerroFluid that George passed around). Dr. Lisensky is a member of the MRSEC Interdisciplinary Education Group at the University of Wisconsin-Madison.

During the excellent lunch prepared for us by the Crystal Lake cafeteria, we also had our section business meeting; during the meeting our host, Scott Beutlich was elected as the new Section President, Mel Sabella of Chicago State University was elected as the new Section Vice-President, and Martha Lietz of Niles West High School was elected as the new Section Rep.

After lunch, we had two workshops—Section members Diane Riendeau and John Lewis ran a workshop on “Teaching Color”, while George Lisensky ran one on “Nanotechnology”.

Look for members of the Chicago Section to be quite prominent at the upcoming National AAPT meeting in February

2009—and in particular, we hope everyone can attend the Chicago Demo Team presentation Friday evening!

Paul Dolan, Section Representative

ONTARIO

Report from the Ontario Section: Annual Conference of the Ontario Association of Physics Teachers, Ryerson University, Toronto, Canada (<http://www.oapt.ca/>)

More than a hundred of physics teachers, physics professors and pre-service teachers from all corners of Ontario, Canada came to Ryerson University to attend the Annual Conference of the Ontario Section of the AAPT during the May 22-24 of 2008. The Conference was hosted by Ryerson University and sponsored by the Ryerson Department of Physics and Astronomy, Ryerson Faculty of Engineering, Architecture and Science as well as the Ryerson Vice-President for Research and Innovation.

The Conference organizers worked very hard to create an exciting and enriching conference and based on the participants’ feedback they succeeded. The key note speakers included Dr. Katharine Hayhoe, a physicist by training and an atmospheric scientist with a vast expertise in modeling climate change and its impact on us. Katharine gave an address that brought an avalanche of questions from the teachers. Faculty members from the Department of Physics at Ryerson presented talks on medical physics and organized tours to the Department led by many graduate student-volunteers. The six workshops ranged from the Dark Matter workshop presented by the Perimeter Institute, to the workshops on Reformed Teaching Protocol (by D. Macisaac and K. Falconer), and a Workshop focused on using interactive lecture demonstration in physics teaching (presented by the Ontario District School Board science specialist, Mr. J. Atherton). The Teacher-Student panel attracted Ontario undergraduate students who came to share their ideas on how we can ease the high school – university transition and help more students be successful in undergraduate physics classes. A very special talk by Professor Emeritus from the University of Guelph, James L. Hunt, showed the links between art and science via an exciting and hands on discussion of anamorphic images.

During the Conference, the President of the OAPT, Mr. James Ball proposed a motion in support of the Canadian Association of Physicists’ request to the National Science and Engineering Research Council of Canada to start funding physics education. This motion passed unanimously.

The Conference participants also witnessed a very special event when a long time OAPT member and one of the most prominent physics educators of Ontario, Mr. John Caranci, was awarded a life-long membership in the OAPT in recognition of his life-long contribution to improving physics teaching in Ontario. To learn more about the Conference and see numerous photos, please visit our web site: www.oapt.ca

Conference organizing committee: OAPT Executive Board (President – James Ball and all the Executive Board members) as well as Prof. Pedro Goldman, the Chair of the Department of Physics, Ryerson University, Toronto, Canada.

Dr. Marina Milner-Bolotin, Section Representative

HAWAII

Here is a brief list of our 2008 Hawaii Section activities. Mahalo, Jim Redmond-AAPT-Hawaii Section rep.

23 Feb. Physics Olympics at UH Manoa
26 April Hawaii AAPT meeting at Sacred Hearts Academy
6 Sept. Hawaii AAPT meeting at Punahou
15 Nov. UH Manoa Physics & Astronomy Open House

Hawaii AAPT/Paul Hewitt Physics Teacher Awardees (given to the teacher of the student with the top physics project at the state science fair)

2003 Teresa Cheung	Kailua High School
2004 Naidah Gamurot	Kapolei High School
2005 Naidah Gamurot	Kapolei High School
2006 Lucille Imamura	Waipahu High School
2007 Lucille Imamura	Waipahu High School
2008 Sophia Hu	McKinley High School

James Redmond, Section Representative

NORTH DAKOTA

The North Dakota section of the American Association of Physics Teachers met twice during 2008.

Meeting One

The ND section met from 8-10 a.m. on 29 March 08 in Minot, ND, on the Minot State University campus. The meeting was held in conjunction with the North Dakota Science Teachers Association's annual meeting which was held on the same site. Twelve members were present. The meeting opened with section business and was followed by discussion and sharing of demonstrations and teaching ideas.

Meeting Two

The ND section met from 10-12 am on 24 Oct. 08 in Fargo, ND, on the Fargo South High School campus. The meeting was held in conjunction with the North Dakota Education Association's annual Educator's Conference ("Teachers Convention"). Ten members were present. The meeting covered election of officers for the coming year, section business, plus discussion and sharing of demonstrations and teaching ideas.

Donald L. Hoff, Section Representative

COLORADO/WYOMING

The CO/WY Section of AAPT met at the Colorado Association of Science Teachers (CAST) convention on Friday, November 21st, 2008

Prior to the meeting we participated in the CAST convention with a sponsored room. We had talks on a variety of topics indicated in the table below. We sponsored these talks in the sense that we paid for the speakers entry fees and sought their participation in advance. This model seemed to work pretty well for getting more participation. There were additional physics sessions we did not sponsor as well.

- Science Overview from the NASA Mars Phoenix Lander with Emily Haynes
- 30 Demos in 50 Minutes with Courtney Willis
- Our Clean Energy Program with Carol Wright

- Water treatment issues and needs for the 21st Century with Mark Van Nostrand
- Go with the flow: Solid ways to teach fluids with Stephanie Chasteen

Attendance was about 10-12 teachers in each of the sessions listed, with the exception of Courtney Willis's demos, which are always popular and hit about 40 teachers alone. It is hard to say how many teachers were different in each talk, except anecdotally, but it appeared to be many new faces each time, and probably 40 teachers were impacted across the day in just the sponsored talks. J.D. Birchmeier – President of the section presided over the meeting, held at the end of the day.

1. Constitution issues: Due to an oversight in a previous meeting, we have gotten ourselves out of synch with our constitution. In particular, our section representative Don Cameron was appointed in an odd year, but that position is to start in an even year. It could be argued this was to complete Steve Iona's term, since he started as national secretary around the same time. Likewise we selected a new Secretary Treasurer (Richard Krantz) and he was appointed in an even year (2008) while this should have taken place in an odd year. Since the fall meeting is not the official business meeting, no actions were taken on these issues.

Related to the above issues, we have had problems with past-president, and president elect positions being held at the same time by the same person. So, there was a general sense that we need to increase the number of active board members to eliminate these constitutional issues.

2. Treasurer's Report: Most of our money comes from the CAST convention, at this time we're flush with over \$13,460 in assets and no liabilities.
3. Spring meeting, April 17th, 18th, 2009: Colorado School of Mines (CSM) Professor, and AAPT CO/WY Vice President, Chuck Stone, will sponsor a 1.5 day long meeting at CSM in the spring. This will include a variety of activities; among the ideas kicked around were the following.
 - a. A demo contest with the SPS students. We'll supply some kind of prizes. JD's suggestion: one for best demo equipment, one for best demo (might be both, of course). Size of prizes would be enough to matter, \$100 minimum, maybe first and second for each category?
 - b. Recommend feeding all the SPS students that attend for free. Estimate \$500 would handle it. Poll of students present was "subs or pizza" (real gourmet...)
 - c. As long as we're doing this, the membership should be invited to submit some personally built demo equipment – for them, maybe a plaque?
 - d. Discussion of "how much to charge" the membership mostly consisted of "if it's free, they will blow it off", so we keep it to \$10 or so, includes the membership in the CO/WY section.
 - e. Possibility of some discussion groups, crackerbarrels, revolving around "how to teach..."
 - f. Possibility of "make and take" sessions on Friday in the spring. JD has the beginnings of a "turn a dead solar path light into a motion detector" one to start. You can get g using a picket fence, use it for light labs, etc.
4. Website/email list issues
 - a. Will look into a yahoo group, moderated of course. Have to

- send an invitation to all members of the DAPT list to join.
- b. Have to send directions for signing up for a daily summary to cut down on the email.
- c. Have to send directions for attachments – in my experience, this never works well, and everyone screws it up.
- d. Have to look at some other state sites

Don Cameron, Section Representative

OREGON

Some exciting news for us to share is the acceptance of our president Stephen Scanell for an Einstein Fellow. Stephen is enjoying his time in Washington; Nina Thompson is now our president. She took on the responsibilities at the last minute to organize the fall meeting – Thanks Nina. We are also pleased to report that the Oregon Teacher of the Year is physics teacher Michael Lampert from West Salem High School. Corinne Manogue from Oregon State University received the Excellence in Undergraduate Physics Teaching Award at the AAPT Summer Meeting in Edmonton. We are also proud of David Sokoloff for being elected the Vice President of AAPT.

At the National Science Teachers Association conference in Portland, AAPT sponsored a Physics Day. This was a full day of demonstrations, curriculum, and content. These workshops provided teachers a variety of opportunities during each of the one-hour presentations. David R. Sokoloff (University of Oregon) presented - Active Learning of Introductory Optics: Interactive Lecture Demonstrations and Optics and Magic Tricks. Raghuvver Parthasarathy (University of Oregon) presented - Adventures in Membrane Biophysics. George K. Quainoo (Southern Oregon University) presented - Materials Science: A Growing and Promising Discipline. Jan Dabrowski (Marylhurst University) presented - Charging Up Your Students: Basics of Electrostatics. Frank E. Vignola (University of Oregon) presented - Photovoltaic Lab Kits and Curriculum. Jason Palmer (Heppner High School) presented - Technology in the Classroom Featuring Applets, Blogs, Excel, and Web 2.0.

North Eugene High School hosted the 177th Oregon Section Meeting on March 8th 2008. As has become a standard part of our meetings since the World Year of Physics, a Physics Demonstration Show was held in the afternoon, open to the public. The first talk was “Energy in the 21st Century Group Project”, by Greg Mulder and Pat Keefe. Lawrence Ruby next talked about how “Einstein Discovered Stimulated Emission” followed by Ellen Siem who shared her thoughts on getting freshmen students to think about nanotechnology. Bruce Emerson presented a talk about his strategy to get students to think like a physicist. Ray Frey talked about “Quarknet” and how it was being used across the nation to help high school teachers engage students in particle interactions and understanding cosmic rays. Stephen Scanell shared his experience with the competition First Robotics. Frank Vignola ended the regular meeting with a talk on solar cell technology and the role solar energy could play in the northwest.

Nina Thompson hosted the 178th Oregon Section meeting at Trillium High School in Portland Oregon on October 18, 2008. The meeting started with a presentation by Tye Heatherington and the work he has been doing with the University of Oregon on the UCORE program. Dennis Gilbert (Lane Community College)

presented an overview of the summer AAPT national meeting in Edmonton Canada. Dedra Demaree (Oregon State University) talked about the curriculum reconstruction that has been taking place for the past several years at Oregon State. There have been major changes in pedagogical goals that have required physical changes to the classroom design. Cheryl Kleckner, ODE Science Education Specialist, presented the draft revised science standards to science educators. There was a good discussion and feedback with the group. This was an important opportunity for the state representative to hear from a wide array of physics teachers and get their ideas. It was also useful for us to hear what some of the problems and shortcomings are in drafting science standards. There was a lot of time to talk about major changes that were happening across the state, which allowed us to gain a greater understanding of the issues rather than an update to the changes. Vernier provided a workshop on their new data-collection technology, which was a great opportunity for our members to take advantage of.

Erik Bodegom from Portland State University has been working very hard this year with his university so that the 2010 AAPT Summer National Meeting can take place in Portland!

We would like to thank Vernier Software for their continued support of our section.

Historic note: The 1st meeting of the Oregon Section occurred on May 16, 1931 at O.S.U. in Corvallis, and the group has been convening more-or-less regularly ever since. This 1st date makes the Oregon Section the 3rd oldest section in the U.S. The 2nd meeting of the Oregon Section took place on November 12, 1931 at Linfield College in McMinnville, and inaugurated the policy of varying the sites of successive meetings. The 100th meeting was held on December 13, 1969 at O.S.U. in Corvallis. Such physics luminaries as R. T. Birge (U.C. Berkeley), S. Neddermeyer (U. of Wash.), and M. Phillips (U. Chicago) addressed the 100th meeting. Since then we have had 2 meetings a year.

Pat Keefe, Section Representative

SOUTH DAKOTA

The South Dakota Section of the AAPT held its annual meeting on Friday, February 8, 2008, at Huron, SD, in conjunction with the joint conference of the South Dakota Science Teachers' Association and the South Dakota Council of the Teachers of Mathematics. The first order of business was to judge the local photo contest. Throughout the conference, teachers would vote for which photographs and descriptions they thought were best. The AAPT then counted the votes and judged the descriptions to check for physics content and accuracy. After deciding, a list of winners was constructed with cash prizes and forwarded to chapter treasurer, Dr. Oren Quist, who was not able to attend.

Upon completing the judging of the Photo Contest, the group discussed officers and ways of increasing participation in the photo contest and number of AAPT members. It was again confirmed not to have formal dues but to encourage members to make a voluntary contribution to support the photo contest. It was decided that Arnold Lund, teacher at Jones County Middle School, Murdo, SD, would continue in the office of President. Dr. Joel Rauber would be Section Representative.

Joel Rauber, Section Representative

WASHINGTON

The Washington State Section of AAPT met on October 11, 2008. Although many members had been together on the previous day for a PhysTEC meeting at Seattle Pacific University, the official Washington State Section meeting began when President Robert Hobbs called the meeting to order on the campus of Bellevue Community College. The meeting was well attended by university faculty, faculty from two-year and four-year colleges, high school teachers, as well as students from many of the represented schools.

The meeting began with a pair of invited talks on topics from the cutting edge of physics research. Subhadeep Gupta of the University of Washington spoke on Ultra-cold Atoms and Quantum Gases. His excellent talk made the nuts and bolts of developments in the field of Bose-Einstein condensates accessible to the diverse audience. Michael Schick, also of the UW, then spoke on the physics of drug delivery using what essentially amounts to artificial viruses. After educating the crowd on a subject far from the traditional physics core curriculum, Dr. Schick made an appeal for instruction that address physical topics in the broader context of other scientific disciplines.

Ajay Narayanan then spoke on the benefits and importance of student clubs, be they chapters of the Society of Physics Students or Sigma Pi Sigma. As if to drive the point home, the day also featured many fine talks from students doing various forms of physics research. Sarah Pefley, a student at the UW, spoke on research she had done on Heat Properties and Power Capacities of Lithium Ion Batteries. Cassandra Cook of Western Washington University spoke on physics education research she is conducting on Student Reflections on Conceptual Problems. Bark Buchi and Blake Johnston of Liberty High School spoke on work that they had done with cosmic ray detectors as a part of the WALT project.

The business section of the meeting marked the retirement of longtime Washington AAPT secretary-treasurer Joel Schaaf. While none of us can replace his two and a half decades of institutional memory, his post in the secretary-treasurer role will be filled by Chitra Solomonson of Green River CC. As our new president, Michael Jackson of Central Washington University will host the 2009 meeting. Krishna Chowdary of The Evergreen State College became our new president-elect with a term of service that will start in 2010. Tom Haff of Issaquah High School was elected as high school representative and Marlene Ignacio of Pierce College was elected to serve as two-year college rep.

Several highlights of the meeting came as Bellevue Community College faculty took the opportunity to share the quality of the physics instruction of the host institution. Arthur Goss and Doug Brown displayed the power of the BCC planetarium and demonstrated how modern astronomical research can be used in an introductory classroom. Brian Scott explained how he uses digital video analysis of the Millikan oil drop experiment in a freshman electrostatics laboratory. Last but not least the day concluded with our host and president Robert Hobbs demonstrating the use of Java applets from Colorado's PhET group to teach atomic physics in an algebra-based physics course.

Robert gave an excellent talk which was a fitting end to the excellent meeting that he hosted. Our next meeting will be held either on the campus of Central Washington University or on a

neighboring wind farm depending on the logistic details to be arranged by President Michael Jackson. The 2010 meeting will be held at The Evergreen State College.

Keith Clay, Section Representative

WISCONSIN

Approximately 63 teachers from 19 high schools and 20 colleges, universities and technical schools attended the Wisconsin Section meeting at Chippewa Falls Senior High School in Chippewa Falls, Wisconsin on October 10-11, 2008. Paul Nevins from Chippewa Falls High School was program chair for the meeting.

The plenary speaker after the Friday night banquet was James M. Sabatier from the National Center for Physical Acoustics at the University of Mississippi. He presented a talk titled: The Human as an Acoustic Oscillator: Sensing and Detecting Mechanisms.

The following papers were presented by Section members:

The Long Decay Model of One-Dimensional Projectile Motion

Mark Lattery from UW-Oshkosh

Two-and-a-half Computational Projects in Introductory Astronomy

David Tamres from UW- Stevens Point

Using Science News in the Science Classroom

Laura McCullough from U W-Stout

Oh God, I have to take Physics next semester

John A. Peterson from Hubbard Scientific

Acceleration Recorders—"Bringing the Outside World into the Lab"

Ron Green from SENSIR

A Video Analysis of Projectile Motion...Without Fancy Equipment

Carey Woodward from UW-Fond du Lac

High Temperature Melting in a Microwave Oven

Robert James Foley from UW-Stout (retired)

Easy and Challenging Daytime Projects that Involve Observing the Sun.

Jim Mallmann and Steve Mayer from Milwaukee School of Engineering

Astro-Compass Science Initiative

Alan Scott from UW-Stout

Home Heating with a Ground Source Heat Pump

Milo Opegard from River Falls High School, retired

Civic Engagement Initiatives in STEM Disciplines Conference and Research Opportunities for Two- Year College Students

Jim Madsen from UW-River Falls

The Latest from the IceCube Project

Jim Madsen from UW-River Falls

Galloping Horses and Speeding Cars: Photography and the Perception of Motion

Kenneth Mendelson from Marquette University

AAPT Topical Conference on Advanced Laboratories

Lowell McCann from UW-River Falls

Science & Stipends & Supplies—Oh My! A Physical Science Workshop for K-12 Teachers

Gubbi Sudhakaran and Mike LeDocq from UW-La Crosse and Western Technical College

Preparations for Lecture/lab Physics at UWP

Philip Young from UW-Platteville

Teaching Physics Using 2-Liter Pressurized Air/Water Soda

Bottle Rockets

Kim Pierson from UW-Eau Claire

The Active Electron

Larry Stookey from Antigo High School

Integrating Physics and History—An Under-graduate Honors Course on the Atomic Bomb

George Stecher from UW-Eau Claire

Modeling the Compact Disc Read System during Introductory Lab

Brad Hinaus from UW-Stevens Point

Eight Semesters of Mastering Physics Discussion and Analysis.

Jerome Wilson from UW-Platteville

The following workshops were offered at the meeting:

NEW TEACHER WORKSHOP!! Sponsored by the AAPT

Judy Schmidt Oak Creek HS (retired) and Gary Baier from Green Bay East High School

Inexpensive Laboratory Exercises in Thermodynamics, Electricity & Magnetism, Modern Physics

J. Patrick Polley from Beloit College

Labs and Demos

Led by Melissa Vigil from Marquette University

Ripon College Physics Fun Force: Making Science Fun!

Joshua LeGreve and Joshua Frey, students at Ripon College

Make Your Students Think Like Scientists – Five Astronomy-Based Activities

Lyle Ford from UW-Eau Claire Physics & Astronomy
Amusement Park Physics

Paul Nevins, and Nick Gagnon, from Chippewa Falls HS and
Gary Baier from Green Bay East High School

AWARD

Jim Madsen from UW-River Falls received this year's Service to and Excellence in the Teaching of Physics at the College Level award. Erik Hendrickson presented the plaque.

ELECTIONS

- High School Representative: Gary Baier
- Two-Year College Representative: Roger Hanke
- Awards Committee: Melissa Vigil
- Awards Committee – College Representative: Nathan Miller
- Workshops Committee – President-Elect: Steven Sahyun
- Workshops Committee – High School Representative: Nick Gagnon
- Workshops Committee – College Representative: Brad Hinaus
- Publications/Promotions Committee – High School Representative: Larry Stookey
- Vice President, Program Chair, for 2009: Steven Sahyun

Jim Mallmann, Section Representative

MISSOURI

The annual fall meeting of the Missouri Association of Physics Teachers (MAPT) was held at Northwest Missouri State University, Maryville, on Nov. 8, 2008. John Shaw, Northwest Missouri State University, presided. There were four oral presentations, and about a dozen members in attendance.

Oral Presentations:

Challenges in Helping Ninth Grade Physical Science Teachers Prepare for Certification in Physics, Gibbons, P.C., and Wiegers, J.F., Dept. of Physics, and Science Outreach, Washington University in St. Louis.
Cold Air Intake for a Residential Air Conditioner, Casebolt, John A., Dahiya, Jai N., Physics and Engineering Physics Dept., Southeast Missouri State University.

Extreme Light-Pulses to Resolve Ultra-Fast Electronic Motions, Chakraborty, Himadri, Dept. of Chemistry and Physics, Northwest Missouri State University, Maryville, MO 64468

Hands-on Activities Designed for a General Education Astronomy Laboratory, Richardson, D.S., Dept. of Chemistry and Physics, Northwest Missouri State University, Maryville, MO 64468.

The next meeting is April 25, 2009, at Northwest Missouri State University, Maryville. As usual, this will be a joint meeting with the Senior Physics Division of the Missouri Academy of Science.

The annual spring meeting of the Missouri Association of Physics Teachers (MAPT) was held at Missouri Southern State University, Joplin, on April 18-19, 2008. As usual, this was a joint meeting with the Missouri Academy of Science (MAS). Section President, Kartik Ghosh, Missouri State University, presided, acting also as the Chair of the Senior Physics Division of the MAS. There were six oral presentations, and about 20 members were in attendance.

Oral Presentations:

Cobalt Doped Indium Oxide Dilute Magnetic Semiconductors for Spin-Electronic Applications, Ghosh, A., Ukah, N., Gupta, R., Kahol, P., and Ghosh, K., Dept. of Physics, Astronomy, & Materials Science, Missouri State University.

Non-Unique Solutions for Two Resistive Loads in Parallel in DC Electric Circuits, Tansil, J.E., Dept. of Physics and Engineering Physics, Southeast Missouri State University.

Organic Solar Cells, Bhattacharya, A., Dhopade, Y., Gupta, R., Kahol, P., and Ghosh, K., Dept. of Physics, Astronomy, & Materials Science, Missouri State University.

Au-SrTiO₃ Nanocomposite Thin Films for Infrared Applications, Ganti, S.N., Gupta, R., Ghosh, K., and Kahol, P.K., Dept. of Physics, Astronomy, & Materials Science, Missouri State University.

ZnO Nanoparticles for Bio-Medical Applications, Nag, N., Ghosh, K., Gupta, R., Kahol, P., and Manivannan, K., Dept. of Physics, Astronomy, & Materials Science, Missouri State University.

Challenges in Implementing Physics First, Gibbons, P.C., and Wiegers, J.F., Dept. of Physics, and Science Outreach, Washington University in St. Louis.

Business Meeting:

At the business meeting, the next fall meeting was set at Northeast State University, Maryville, date to be announced later. Elections were held for a new section Vice President; the current Secretary-Treasurer and Section Representative were re-elected. Last year's Vice President and President-Elect move up in turn to President-Elect and President. New and current officers are:

President – John Shaw, Northwest Missouri State University, Maryville

President-Elect – Pat Gibbons, Washington University, St. Louis

Vice-President – Sunder Balasubramanian, Lincoln University, Jefferson City

Secretary-Treasurer – Robert J. Whitaker, Missouri State University, Springfield

Section Representative – Jim Borgwald, Lincoln University,
Jefferson City

There was some discussion of the possibility of a new national section of the AAPT consisting of the St. Louis Area Physics Teachers (SLAPT), currently an affiliate section of the AAPT. It was decided to consider the matter formally after the SLAPT identifies a list of zip codes to be included in the new section, as required by the AAPT before this new section can be approved nationally. The AAPT requires the MAPT to make a formal approval of the zip codes to be removed from the MAPT. Pat Gibbons and Jim Borgwald both expressed willingness to work with the SLAPT to formulate the list of zip codes for the new section, but the primary work for this proposal will come from the SLAPT. The next time the MAPT can consider this proposal will be at the business meeting for the next meeting in fall, 2008.

James Borgwald, Section Representative

CHESAPEAKE

The Spring Section Meeting of 2008 was held in conjunction with the AAPT Winter Meeting in Baltimore, MD on Tuesday January 22, 2008. There were 16 in attendance at the special Chesapeake Section session, which was from 9-11 am in Harborside D. There were three talks:

1. Carl Mungan, United States Naval Academy, "Optical Phase Change Upon Reflection"
2. William Warren, Lord Fairfax Community College, "Introductory Textbooks: Too Much Information?"
3. Eric Kearsley, Albert Einstein High School: "Using Black Holes to Teach Thermodynamics in Physics."

Following the talks, there was a business meeting in which the next three upcoming CSAAPT meetings were scheduled. The Fall Meeting of 2008 will be at Tidewater Community College, the Spring Meeting of 2009 at Lord Fairfax Community College and the Fall Meeting of 2009 at George Mason University. Father Frank Haig recommended that we consider having a joint meeting with the Washington Academy of Sciences in the spring of 2010. Bill Warren highly recommended the activity based physics institute, and there was a discussion of the possibility of establishing a Washington DC metro area local area network.

The Fall Section Meeting of 2008 was held at Tidewater Community College in Virginia Beach, VA on Oct 3-4, 2008. There were 24 in attendance. The meeting began with an excellent Compadre Workshop presented by Ed Lee of the APS. This was followed by a banquet and then a Planetarium Show, which featured the Digistar 3 Laser projector in the new 40 ft dome of Tidewater Community College. An all dome movie was presented, along with a demonstration of some of the bells and whistles of this digital planetarium projector. On Saturday morning, the following talks were given:

1. *Hangin' with Isaac and Henri: Chaotic Behavior in Simple Systems*, William H. Ingham, Department of Physics and Astronomy, James Madison University
2. *Spreadsheet physics: examples in meteorology and planetary science*, Rhett Herman, Department of Chemistry and Physics, Radford University
3. *A Physics Workshop for K-6 Teachers*, Harold Geller, George

Mason University

4. *Use of an Online Homework System and Its Effect on Student Learning and Grades*, Brett Taylor, Department of Chemistry and Physics, Radford University
5. *Geometry for relativity*, Lincoln E. Bragg, Raytheon Corporation
6. *Phony Physics*, David Wright, Tidewater Community College
7. *Optical Images Formed by Lenses & Mirrors*, Carl E. Mungan, U.S. Naval Academy

Following the talks there was a luncheon, a business meeting and then another outstanding workshop presented by Ed Lee. This one involved learning about physics by building motors.

In the business meeting, new officers were elected, and a constitutional change was discussed. All in attendance were in favor of making the change, which is to eliminate the elected Vice President for Communication and establish an appointed Communications Liaison. The measure was later confirmed by an e-mail vote.

David Wright, Section Representative

OHIO

The Ohio Section of the American Association of Physics Teachers held its Fall 2008 meeting in the Physical and Social Sciences Building at the Lorain County Community College in Elyria, Ohio on Saturday, October 11th. Our host, Steve Majoros, a physics professor at LCCC, introduced the plenary speaker, Dr. Ray Jayawardhana.

Plenary Session

The Diversity of Extra-Solar Planets

Ray Jayawardhana, Associate Professor of Astronomy and Astrophysics, University of Toronto, Canada
Reported by Ken Kane and Myra West

Professor Jayawardhana began his talk by discussing how extra-solar planets are discovered. A major method is for astronomers to study the Doppler Shift due to an apparent stellar wobble. One example involves the Sun-like star, 51 Pegasi. The wobble has a four-day period. This is caused by a giant planet about half the mass of Jupiter, but located only about 0.05 AU (closer than Mercury is to the Sun) away from its sun and having an orbital period of 4 days.

In 1999 multiple planets were discovered in the Upsilon Andromedae System. The three planets are 0.75, 2, and 4 times the mass of Jupiter with locations of 0.06, 0.83, and 2.5 AUs from their star. The orbital periods of these planets are 4.6 days, 242 days, and 3.5 years. (Note: these planets obey Kepler's laws of planetary motion. So the closer a planet is to its sun, the shorter is its orbital period and the farther away, the longer its period.)

We now know of more than 300 extra-solar planets, according to Dr. Jayawardhana. So far, all of these planets are hot, Jupiter-like gaseous planets very close to their star. Only a few have been found as far as 5 AU (the Sun-Jupiter distance) from a star.

There are at least five planets around 55 Cancri, but it is very difficult to separate them from each other. There are three planets around the red-dwarf, Gliese 876, including a planet about seven times the mass of the Earth, having a two day period. This planet was discovered after removing the data from the two larger planets in the system.

The discovery of these few earth-mass planets of 5 to 10 times the mass of the Earth has raised an interesting question about the

composition of these planets. Are they rocky like the Earth or are they gaseous like Jupiter? In order to determine the type of planet, we need both the mass and the radius of the planet.

There are many more low-mass planets in the range of 0 – 4 Jupiter-masses than the larger ones of 5 or more Jupiter-masses. Astronomers think that there are fewer of these super Jupiter-like planets because it takes a longer time to accrete a large enough mass to produce these super-sized planets. Most of the planets discovered so far seem to be gas giants, but recently a few super-earth-mass planets have been discovered.

Prof. Jayawardhana pointed out that there is a “pile-up” of these extra-solar planets about their stars. The distribution of the orbital distances ranges from less than 0.1 AU and 1 AU. Astronomers believe that many planets may have been formed farther away and then migrated closer to the star. Some may have even “fallen” into the star. It is thought that some planets may have “parked” themselves at the inner edge of the star’s disk. All of this may explain why metal-rich stars are more likely to have planets than those whose composition have few metals.

Another method for finding extra-solar planets is by observing planetary transits of a star. At least 45 planets have been discovered this way. The planet transit in front of its star is not found by seeing a “black dot”, but by noting a temporary change in the brightness of the star. Even a 1% drop in brightness can be detected.

Most of these planets have very short periods with some as short as 1.5 – 2 days and others with longer periods of 5 – 6 days.

Information from the light curves and the Doppler Effect allow for the determination of the radius and the mass of the planet. Then the density of the planet can be calculated. Analysis of HD 209458 showed a dip in brightness of only 1.5%. The density of the transiting planet indicates that it is a gas giant like Jupiter or Saturn.

At La Palma in the Canary Islands, the SuperWASP has found more than 15 transiting planets, ten of them in just the past year. The SuperWASP is an array of several ten-centimeter telescopes mounted with CCD’s (charged-coupled device used to detect photons).

Prof. Jayawardhana presented the example of Ogle-TR-56. The planet has density less than that of water – about that of Saturn. Another example was that of HD 149026 which has a planet with a density near that of Jupiter, but is found to have a core equal to nearly seventy Earth-masses.

There seems to be a wide range of internal structures and varying densities of these extra-solar planets. Yet, the structures of most of these planets are unknown.

His next topic was that of the atmospheres of these planets and how they are detected. The Hubble Space Telescope is being used for this purpose. Starlight passes through the planets’ atmosphere when it makes its transit in front of the star. The spectrum of the starlight is recorded both when the planet is transiting it and when it is not. The difference between the two is due to the atmosphere of the planet.

The Spitzer Space Telescope is an infrared telescope detecting longer wavelengths than that of the Hubble Space Telescope. This telescope can detect the presence of water in the atmosphere of some extra-solar planets.

The difficulty of trying to study the atmosphere of an extra-solar planet from a ground-based telescope is the Earth’s own atmo-

sphere. In his own research, Dr. Jayawardhana and his students are using the Gemini telescope to study the atmosphere of these planets. Measurements cannot be made directly, but some modest success has been achieved using relative measurement techniques.

The most promising method used to study planetary atmospheres is that of secondary eclipses. Light from a star is recorded and analyzed when a planet is in three positions relative to its star – behind, in front of, and beside the star. The spectrum and the brightness of the star are a little different in each position. Such research is currently being done by one of his students in Hawaii.

Another use of the Spitzer Space Telescope has been to obtain crude “weather maps” of extra-solar planets. These weather changes are due to heat transfers on the planet by winds. Next month a transiting planet with a highly eccentric orbit near the star HD 17156 is going to be studied. The weather changes dramatically when it passes close to the star compared to when it is much farther away.

The use of “micro-lensing” is another technique employed in the search for extra-solar planets. Micro-lensing is an event which occurs when a star moves in front of a distant background star in alignment along our line-of-sight. Light from the distant star is gravitationally bent around the object star acting like a lens. About half dozen extra-solar planets have been discovered using this technique. A Jovian planet was discovered around OGLE 2005-BLG-071 and a five Earth-mass planet of orbital radius of 3 AU was discovered around the M-dwarf star OGLE 2005-BLG-390Lb.

Interestingly, micro-lensing was first being used to look for dark matter, but resulted in the discovery of a few extra-solar planets.

What will the future bring to the search for extra-solar planets? Upcoming missions will involve the use of adaptive optics to “take pictures” of these planets. The hope is that the light from the star can be blocked out so that an “image” of the planet can be recorded. The Gemini telescope will be the primary one for this project.

The usual process is to look at young stars. A young star’s planets are still very large and warm and thus generate their own light as well as being located far away from its star. An “image” has been recorded of an eight Jupiter-mass planet around a brown dwarf. This planet is 330 AU from its star and has a surface temperature about 1800 K. The hope is that with the “images” of these planets questions about planetary formation can be answered.

More space telescopes will be available in the near future to continue the “imaging” of extra-solar planets. The Kepler telescope will be launched in 2009 and the James Webb telescope, successor to the Hubble Space Telescope, in 2013. A ground-based thirty-meter telescope is planned to be built in 2016. Dr. Jayawardhana said that the ultimate goal is to build and launch a space array to find and study more extra-solar planets.

In answering questions from those assembled, he reminded us that these discoveries have been made in only the past 13 years. It is suggested that super-earths may be more inhabitable because they are probably more stable. Innumerable suns exist possibly with innumerable “earths” revolving around these suns.

Note: Dr. Ray Jayawardhana’s talk was sponsored by the American Astronomical Society.

Editor’s Note: In the current issue of *Physics Today* is an article on the same topic. Schwarzschild, Bertam, “Direct Imaging Reveals Exoplanets in Orbital Motion”, *Physics Today*, January 2009, pp.11-13.

Presentation of Section Award

Jim Andrews, Past-President of the Ohio Section, made the presentation of a plaque awarding Dick Zitto lifetime honorary section membership in recognition of his years of service to both the Ohio Section and the national AAPT. Dick also received a distinguished service citation at the Summer Meeting in Edmon-ton this past summer.

How I Do It

The following are presentations by members in the “how-I-do-it” session of the meeting:

Measuring Acceleration of Magnet Falling through Coils

David Van Arsdale, LCCC

A different technique for measuring the acceleration due to gravity.

Vernier Sound Level Meter and iPods

Natalie Cooper

Through the use of a doll, Debbie Decibel, to measure hearing loss of high frequencies due to using iPods.

Elastic Collisions

Fred Gram, Tri-C

Calculate the center of mass and its velocity in the flash movie from the Center of Mass unit.

The Physics of Cell Phones

Ken Kane, Gilmour Academy

A few of the demonstrations from the workshop by Mark Davids in Troy, MI.

Student Projects

Nate Van Wey, Perry High School

His students built a bed of nails and LCD diffraction instruments. Students are analyzing data from the Green Bank Radio Telescope to search for pulsars. Nate encouraged faculty to take advantage of summer research opportunities.

Planetary Travel Brochures

Laurie Mears, Sandusky High School

Use of “Space Trips Я Us” brochure to get students interested in astronomy (found at the end of this newsletter).

What to do After Physics Day at Cedar Point

Bob Spears, Bowling Green-Firelands Campus

What to do after retirement? Bob is now teaching some short courses at Elder College at the campus. Wondering about the sun-spot cycle and the Earth’s weather? Look at spaceweather.com.

Electrostatics Using an e/m Tube and Dueling Electroscopes

Steve Majoros, LCCC

Demonstrations of how students use an e/m tube to deflect beam, discharge plate, etc.

Business Meeting

Reported by Ken Kane and Myra West

The Ohio Section AAPT President, Mary Kay Patten, welcomed those in attendance and thanked Steve Majoros for hosting the meeting. She also thanked Lorain Community County College for providing the meeting rooms as well as lunch for the attendees.

Ms. Patten asked the Section members to consider offering their home institutions as possible meeting sites for future Ohio Section meeting and serving as host for that meeting. She said that can either contact her or any member of the Executive Board. She also extended an invitation for Section member to consider serving as members of the Section Executive Board.

Mary Kay announced that the Ohio Section will sponsor the High School Photo Contest as it has in the past two years. The photos will be judged at the Spring Meeting at Baldwin-Wallace College in Berea. Although the meeting date had not been set at the time of the announcement, the Spring Meeting will be held on March 28, 2009. She encouraged all high school teachers of the Section to encourage their students to submit photos to the Section contest and also to the national AAPT High School Photo contest. Information and rules were available at the meeting and are also on the Section web-site (www.osaapt.org).

Copies of the Treasurer’s report were distributed by Joellen O’Neill in the absence of Charlie Reno. If anyone has questions about the report are welcomed to contact Charles Reno.

Myra West distributed the Section Representative’s Report to those in attendance. The complete report follows this report of the business meeting.

In Memoriam

Larry Badar offered an “in memoriam” to mark the passing in August 2008 of long-time and founding member of the Ohio Section, Stefan Machlup. Stefan was born in Austria. He earned his Ph.D. under Lars Ansager on the topic of thermodynamic irreversible processes. Included in the dissertation is the “Ansager-Machlup Corollary”. Stefan was always interested in thermodynamics as a theoretician. Larry recounted having taken a class in solid-state physics taught by Stefan in 1958 when solid-state physics was a new phenomenon.

Stefan became a member of the Western Reserve University in 1957 and survived the later merger with Case Institute of Technology to become Case-Western Reserve University. He published many research papers and authored a college physics textbook.

Dr. Machlup was one of the original members of the PSSC workshop groups started in the country in the early 1960s. The Cleveland group later formed the Ohio Section AAPT. He studied and stoke about the kinematics of cars at a stoplight as well as the dynamics of automobile collisions. He was a regular contributor to the Section’s “How-I-Do-It” sessions. He literally “shook with excitement” doing physics or presenting topics about it.

Stefan loved music. He played the cello. He was an active member of the Cleveland Chamber Music Society.

His third passion behind physics and music was skiing. He regularly went to Europe to ski.

Larry recalled being with Stefan at the Case-Western Reserve University’s Physics Department Christmas dinner last year. It was the last time that he was with Stefan.

In addition to his memoriam to Stefan, Larry made an announcement that the American Institute of Physics (AIP), home to the Neils Bohr Library, has been chosen to be the archival home for the materials from the PTRAs (Physics Teachers Resource Agents) program.

Myra R. West, Section Representative