NJAAPT Newsletter
September 2008

President's Message

It's that time of year to welcome all of you back to a new and exciting adventure in the wonderful world of physics teaching. I trust that you enjoyed the time away from the classroom and had a productive summer. I am aware that some did traveling on behalf of the NJAAPT; others did so for self-improvement, and some to get some very needed R & R. Whichever it was for you I wish those batteries are charged for the upcoming school year.

The executive board met in August to prepare for the year and you will find the tentative list of activities in the newsletter. Again we will make our presence known at the New Jersey Science Convention in October with Demo Dens scheduled. Please refer to the additional programs handout for the time and location, as they are not listed in the printed program. This begins to point out our dilemma of trying to do so much but with a very limited resource of individuals willing to volunteer their services. You have heard it before and it is a problem that we are attempting to solve, albeit an immense obstacle to overcome.

While on the subject of the NJSC, have you filed the paperwork required for attending the event? Well, there is a new twist on the approval process of which we became aware of only in July. I received an email from Tom Smith, the NJSTA President, about the matter and a subsequent email was the response of Michael Heinz, the Science Coordinator for NJ. Please read the text of the new requirement in this issue as it may adversely impact upon your attendance at the NJSC.

Preparations are already underway for Holiday Treats and our Spring Sectional Meeting at Princeton. This year we are going to have announcements and registration forms for Holiday Treats at the NJSC and they will also be emailed to you. Do not sit on the registration because the event sells out very quickly.

And, finally, we can once again look to visiting Bergen Community College in the fall for a meeting at the Paramus campus. Besides a couple of speakers, the solar telescopes will be available for our use, as will the telescopes for night viewing. Anyone who attended last year will tell you that it was a great time to get together with teachers from the surrounding area.

Have a great year and let us know what we can do for you.

Ray Polomski

Status Report on AP Physics B Redesign at Edmonton AAPT Meeting By John L. Roeder

The AP Physics B syllabus is being revised. So also are the syllabi for AP Chemistry, AP Biology, and AP Environmental Science – all the AP science courses except Physics C. Why? A report based on the National Research Council's *Learning and Understanding* showed that the syllabi for all these courses had too much breadth and not enough depth, while AP Physics C was lauded for emphasizing depth rather than breadth.

As a result of this report, NSF provided support to develop new syllabi for AP Physics B, Chemistry, Biology, and Environmental Science. At the July 2008 American Association of Physics Teachers (AAPT) meeting in Edmonton, AB, Larry Cain, John Eggebrecht, and Connie Wells presented what had been done so far for AP Physics B and what is coming up in the next few years.

Although this trio focused on the AP Physics B course, they were quick to note that the commissions in charge of recommending revisions to all the AP science courses came up with essentially the same principles they wanted to embody their recommendations: to provide a course accessible to a diverse body of students, to employ reform teaching methods, such as inquiry, and to focus on depth rather than breadth, and to provide professional development to teachers so that they will teach the course using these reform teaching methods. Although the model for the course has been completed, the design for curriculum and assessment is still going on, and the course will not be implemented until 2012.

The AP Physics B redesign commission was chaired by Cain (from Davidson College) and Gay Stewart (from the University of Arkansas), and included in its membership former AAPT Presidents Robert Beck Clark and Ken Heller, both of whom have also been heavily involved with teacher preparation or physics education research. There is also a peer review group, which meets with Cain and Stewart to harmonize the work of the peer review group with that of the commission. The Curriculum Development and Assessment Committee includes Eugenia Etkina, Jose Mestre, Robert Morse, Joe Redish, Deborah Roudebush (also a member of the redesign commission), and Gay Stewart, all of whom have been instrumental in implementing reform methods of science teaching.

Summer 2008 AAPT Meeting

For a truly remarkable recap of the Summer Meeting of the AAPT that was held in Edmonton, Alberta, Canada read Jim Kovalcin's report. Due to the depth of coverage, please go to our website to read it. This article certainly gives you a great feel for what you can expect if you attend a national meeting. The dates of the meetings for 2009 – 11 are listed later in the newsletter.

MJAAPT 2008 -09 Schedule

Oct. 14 – 15	NJSC
Nov. 1	Bergen County Community College Meeting
Dec. 6	Holiday Treats
Jan. 10	Physics Olympics
Feb. 20	Dave's Demo Night
Mar. 20 – 21	Sectional Meeting

Check website for updates on activities.

Physics Club of New York
2008-2009, 110th Season

Friday, 19 September 2008: Gail Horowitz, Dept. of Chemistry, Yeshiva University, **ghorowit@yu.edu,** "Using the Digital Resources of the *Journal of Chemical Education*"

Ms. Horowitz received a B.A. in chemistry from Barnard College and an M.A. in chemistry from Columbia University and is a Ph.D. candidate in science education at Teachers College. She has been a Chemistry Instructor and Laboratory Coordinator at Yeshiva University since 1990.

Friday, 17 October 2008: Gail Christopher Ward, Hommocks School Mamaroneck, NY, Ward@mamkschools.org, **"Using Video Interactively in the Classroom"**

This will be an overview of strategies to use with clips from Channel Thirteen's website in biology, chemistry, physics, and Earth Science. Learn how to access this site, what the site offers, and other services offered by http://www.thirteen.org/edonline/educators.html.

Friday, 14 November 2008: David Maiullo, Physics support Specialist, Department of Physics and Astronomy, Rutgers, the State University of New Jersey, Maiullo@physics.rutgers.edu, **"Physics Demonstrations as Theater"**

David Maiullo, one of the leading physics demonstrators in the United States, articulates his philosophy as follows: "Physics demonstrations should be fun and exciting. They hold the interest of students while introducing and reinforcing important concepts. You should enjoy performing the demonstrations as much as your students enjoy watching them. I'll try to show the common problems and pitfalls teachers and instructors run into while doing demonstrations, as well as illustrate how a successful physics demonstration can be performed."

Friday, 12 December 2008: Jin Kim Montclair, Assistant Professor, Polytechnic University, jmmontcla@polu.edu, **"Bio Related Polymers"**

The Protein Engineering and Molecular Design Lab began July 2005. Broadly, the lab is focused on engineering macromolecules. The long-term goal of its research is to be able to predictably design or engineer artificial therapeutics, biocatalysts, scaffolds, and cells – to provide biologically inspired solutions to address the challenges of human disorder treatment and medicine, sustainable energy, and environmental remediation. Dr. Montclair received her B.S. summa cum laude from Fordham University and her M.S. and PH.D. in bio-organic chemistry from Yale.

Friday, 9 January 2009: Jerry DeMenna, Fun-Science Academics, New York, NY, jerry@FUN-SCI.com, **"Learn That Technology is Fun: Spectrometric Examination of Barbecue Sauce"**

Friday, 13 February 2009: Dr. David W. Hogg, Associate Professor, Center for Cosmology and Particle Physics, Dept. of Physics, New York University, david.hogg@nyu.edu, **"Massive Data Sets in Astrophysics Including Sloan Digital Sky Survey"**

Dr. Hogg participates in and uses the very large Sloan Digital Sky Survey (http://www.sdss.org/) and other large surveys. His group maintains and uses more than 30 Tb of astronomical data. They do science with, and create new data analysis techniques for, data sets of non-trivial size and complexity. They have started a big projection automating astrometry (http://astrometry.net/), which is crucial for the next generation of enormous astrophysics projects.

Friday, 13 March 2009: William Horak, Chair, Energy Sciences and Technology Department, Brookhaven National Laboratory, horak@bnl.gov, **"Integrated Planning for Energy Security and Environmental Sustainability"**

Friday, 24 April 2009: "Demo Derby"

This is an evening of nonstop 5-8 minute demonstrations. Just bring your demo along with cleanup equipment and safety apparel.

Friday, 15 May 2009: Award Dinner

All meetings (except the Award Dinner, whose location has not yet been determined) are held in Room 207, Silver (formerly Main) Hall, 32 Waverly Place (southeast corner at Washington Square East), at 7:15 p.m. They are preceded by dinner at 6 p.m. at Caffé Pane e Cioccolato, 10 Waverly Place at Mercer Street (southwest corner). Call Secretary-Treasurer John Roeder at The Calhoun School, (212)-497-6500, in the event of inclement weather.

North Jersey Regional Science Fair

March 20 - 21, 2009 at Rutgers University, College Avenue Campus, New Brunswick, NJ (http://www.njrsf.org)

The North Jersey Regional Science Fair (NJRSF) is a non-profit organization that holds an exhibition of student science projects, grades 9 through 12, and is affiliated with the Intel International Science and Engineering Fair (ISEF). The NJRSF covers 10 counties in Northern New Jersey: Bergen, Essex, Hunterdon, Middlesex, Morris, Passaic, Somerset, Sussex, Union, and Warren. Students exhibit their projects in competition for a wide variety of awards. Projects may be done individually or in a small group. The categories include: Biochemistry, Botany and Plant Science, Behavioral Science, Chemistry,
Computer Science, Engineering, Environmental Science, Mathematics,
Microbiology, Medicine and Health, Physics and Earth Science, and
Zoology.

There are two important deadlines for entering the fair. The first is the Certification Deadline, December 1, 2008, for approval of projects involving human or animal subjects, pathogens, or recombinant DNA. The second is the Registration Deadline, February 6, 2009. Student's research plans must be reviewed and approved by an advisor, such as a parent or teacher. The advisor must also review the safety certification checklist with the student to guarantee the student has qualified supervision for potentially hazardous work.

There is a wide array of awards and prizes offered by the NJRSF, including: A Four Year Academic Award for NJIT; Summer Research Opportunities; Summer Science Programs at Stevens and NJIT; and 300 Other Awards Worth up to $5000 in Cash and U.S. Savings Bonds; Category awards range from $500 to $8000. The grand prize is an expense paid trip for four students and their advisors to the Intel International Science and Engineering Fair, which is being held May 10 - 15, 2009, in Reno, NV. The NJRSF provides the only route from the 10 counties to gain entry to the Intel International Science and Engineering Fair (ISEF). Last year, the NJRSF gave over $30,000 in cash and prizes. ISEF awards prizes valued at $1 million.

For more information, please contact either:
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Bill Suits (908) 234-9240 billsuits@earthlink.net
You may also visit our website at http://www.njrsf.org. For more information about ISEF and its affiliated fairs, visit the Science Service website at http://www.societyforscience.org/index.html.

The EinsteinPlus Program at the Perimeter Institute

By Joe Spaccavento

I can assure you that physics is flourishing above our northern border. Somehow I was informed of the application for this program and decided to apply. It was being held at a place called the Perimeter Institute for Theoretical Physics in Waterloo, Ontario. I was aware of Perimeter's reputation and was very impressed with the description of the proposed workshop titled "EinsteinPlus". The description was something like this:

"The EinsteinPlus workshop is a one-week, intensive residential workshop for international high school teachers that focuses on key areas of modern physics — including quantum physics, special and general relativity, and cosmology. It also incorporates sessions on innovative teaching strategies suitable for all areas of physics.

EinsteinPlus focuses on classroom-tested materials with strong connections to many high school curricular and the opportunity for participants to learn about some of the latest developments in theoretical physics from researchers at the forefront of their fields."

I was selected to attend the second program, from July 10- July 16. We had a group of around 40, most were from Canada but it was truly international. I am happy to say that the objectives were met and that I had myself a week packed with modern physics

The main goals of the workshop were to enhance teachers' personal interest, understanding and enthusiasm for modern physics and equip them with new, accessible and useable tools and strategies for teaching this field of endeavor to their students.

Perimeter covered all necessary expenses for each workshop participant. This includes return travel from anywhere in Canada, accommodation during the workshop and all but one of the meals for the workshop's duration. Participants from outside Canada were on then own to get to Canada.

The areas of physics covered include:

Special relativity: postulates of special relativity, time dilation, length contraction, spacetime diagrams, paradoxes such as the twin paradox, Aspects of general relativity: black holes and the GPS, Quantum mechanics: wave-particle duality, quantum secret codes (a.k.a. quantum cryptography) and quantum computers

Workshop includes special keynotes presentations by Perimeter Institute researchers on cutting-edge topics such as superstring theory, dark energy and dark matter and quantum computers.

Several pedagogical topics were also explored include:

- Common student misconceptions about quantum mechanics and relativity and how you can deal with them.
- How can you get students to actually *understand* the concepts you teach as opposed to merely *memorizing* formulae?
- Hands-on activities and experiments your students can do that make modern physics lessons interactive.
- Enduring understandings: What are the core concepts in modern physics that you should be emphasizing?

Now here is something really wonderful, if you visit the perimeter web site: http://www.perimeterinstitute.ca/ there are several places in the outreach area that you can view streaming video of wonderful lectures. It is truly the next best thing to being there. There are plans for continuing the workshop next year, check the perimeter web page, and the NJAAPT we page for information about next years program.

Save the Dates

The following is a listing of the sites and dates of the AAPT Winter & Summer Meetings:

Summer 2009, July 25-29 (University of Michigan, Ann Arbor, MI)

Winter 2010 w/APS, Feb 11-18 (Washington, DC)

Summer 2010, July 17-21 (Portland, OR)

Winter 2011, January 8-12 (Jacksonville, FL)