

NJAAPT Newsletter

June, 2007

President's Message

Can you believe that the year is coming to a rapid conclusion? Many have asked: "What has happened to make the time pass so quickly?" Did you get to accomplish what you set out to do in September? If you did, then your planning was excellent. We are all aware of the constraints placed upon the classroom teacher by mandates and how much instructional time is lost. But most adapt to the changing whims of the educational experts and see to it that their students get the best possible course that can be offered.

At the end of the year, when you finally begin to wind down and the thought of a period of rest refreshes you, it's time to think of what we as a section of the AAPT should be doing to make your job in the physics classroom easier. We all know that workshops are an integral part of our commitment to enhancing classroom instruction, but is that enough? As you peruse this newsletter you will notice that there are some changes coming in the very near future and they involve you.

The executive board has been struggling with the means by which we can involve more of our members in the activities provided during the year. Input is vital to the wellbeing of our section as we need to make our thoughts known to the AAPT and our section members. Many in our section are not members of the AAPT and have not taken advantage of the opportunity to join the national at a reduced rate. The leadership of the AAPT is discussing a proposal to eliminate the section dues and have individuals join the national, which automatically makes them members of the section. Toufic Hakim, the AAPT Executive Officer, addressed this at our sectional meeting. There are certainly pros and cons to the proposal, but it would be good to hear from you about it and any questions you might have. The person to contact in this regard is our section representative, Joe Spaccavento.

Planning for next year is in the works and we will make our presence known at the NJSC in October with four Demo Den sessions and individual talks and workshops. And, yes, we will be back with a booth so you can come by and avail yourselves of the materials that we will have and to renew your membership. The executive board reminds you that you are invited to attend our meetings and participate in making decisions for the membership. Our meeting time and location will be posted at our website, www.njaapt.org, so please check it frequently for this and other announcements.

It is important that you read the newsletter carefully since there is an announcement that will affect the way you receive the newsletter. This is change that has been discussed for a few years and we feel it is now time to go forward with the proposal of emailing the document to as many of our members as possible. Also, check out the information on getting Concept Inventories for your use in physics and geoscience.

Lastly, at this time I would personally like to thank those who have attended any of our events during the past year. Time is precious to all of us, but you have given up some of that time to improve your skills and to aid your students. A special thank you to Borislav Bilash for conducting sharing sessions in the northern part of the state and to Eugenia Etkina and Alan van Heuvelen for their assistance in coordinating our Spring Section Meeting in March. And to those who participate on the executive board or who serve as officers, I can only say that without your time, dedication, and efforts we would not have one of the most active sections of the AAPT. I know this is true because at the Winter and Summer Meetings of the AAPT committee members and the officers of the AAPT present numerous accolades. So to: John Valente, Jessie Blair, Dave Bandel, Dave Maiullo, Nancy Michaelsen, Jim Kovalcin, Joe Spaccavento, Jim Ferrara,

Yitzhak Sharon, and Janet Saylor – a huge **Thank You**. They deserve a tremendous amount of credit for keeping the section viable and in the forefront of providing the best events that can be offered.

Ray Polomski

Newsletter Changes

Over the past few years a plea was made to the membership to switch from receiving the newsletter by mail and having it emailed instead. The response did not reduce the number being sent by regular mail and therefore did not impact our expenditures for postage. The time for a newsletter to be compiled, printed, and mailed is a job that is increasing instead of decreasing.

At the last executive board meeting a proposal was made and passed that will change the way you receive the newsletter. If we have your current email address, the newsletter will be sent to you electronically as a PDF file for you to view online or to print out. Concerns were raised about email addresses being viewed by all who are on the list, but as part of the process the newsletter will be sent as **Blind Carbon Copies**. This means that the email addresses will be hidden from view.

If you have not provided us with an email address, **please** so by emailing me at: r7429@optonline.net. The newsletters will also be available on our website, so if you do not want to have it sent to you by mail or by email, please indicate your wish by emailing me.

Ray Polomski

Newsletter Archives

Since its inception, the NJAAPT has had a newsletter to keep the membership informed of the happenings of the section. We have attempted to place the current newsletters on our website and now are in the process of trying to archive our history. To achieve this goal we are asking any member who might have back issues for assistance. Here's how you can help:

1. you can scan the issue and send it to our webmaster, Jim Kovalcin – email address on our website, www.njaapt.org, under **Contacts**
2. you can send it to Jim to be scanned after contacting him for the address for the material to be sent.

Once the issues are received and archived, the issues will be available to all our members and to the larger AAPT community.

Executive Board Meetings

In an effort to increase the participation of our members in the decision-making process of the NJAAPT, we are seeking additions to our executive board. If you have the inclination to volunteer for a position, please contact Ray Polomski.

Our function is to set the agenda for the section, to interact with other sections, and the AAPT, and to provide meaningful experiences for the membership. Meetings are held either at Rutgers University in Piscataway or at Princeton University approximately six times per year. The number of meeting is contingent upon the needs of the section.

All members are invited to attend an executive board meeting and we encourage you to do so. Meeting dates, times, and sites will be posted on our website.

A Party of Famous Physicists

One day, all of the world's famous physicists decided to get together for a tea luncheon. Fortunately, the door man was a graduate student, and able to observe some of the guests...

Everyone gravitated toward Newton, but he just kept moving around at constant velocity and showed no reaction.

Einstein thought it was a relatively good time, and that the time just flew.

Coulomb got a real charge out of the whole thing.

Cavendish wasn't invited, but he had the balls to show up anyway.

Cauchy, being the only mathematician there, still managed well with everyone.

Thompson enjoyed the plum pudding.

Pauli came late, but was mostly excluded from things, so he split.

Pascal was under too much pressure to enjoy himself.

Ohm spent most of the time resisting Ampere's opinions on current events.

Hamilton went to the buffet tables exactly once.

Hooke quickly sprung into the discussion but fell short.

Archimedes floated in.

Dirac was upset but said he could not tell anyone what was the matter

Volta thought the social had a lot of potential.

Hilbert was pretty spaced out for most of it.

Heisenberg may or may not have been there.

Hertzprung and Russell were busy making diagrams of the dance floor.

Hubble simply expanded the overall prospective of the event

The Curies were there and just glowed the whole time.

Van der Waals forced him to mingle.

Planck was a constant at the h bar, and a frequent source of entertainment

Wien radiated a colorful personality.

Millikan dropped his Italian oil dressing.

Kepler predicted that the winner of the dance contest would cover equal areas in equal time.

Lord Kelvin's date was absolutely hot.

de Broglie mostly just stood in the corner and waved.

Hollerith liked the whole idea.

Stefan and Boltzman got into some hot debates.

Everyone was attracted to Tesla's magnetic personality.

Compton was a little scatter-brained at times.

Bohr ate too much and got atomic ache.

Watt turned out to be a powerful speaker.

Hertz went back to the buffet table several times a minute.

Faraday had quite a capacity for food.

Oppenheimer got bombed.

Teller got super bombed.

Okay, did you get them all! Can you make one better! Do you have any new ones you would like to add! Send me you additions and I will post the new revised list on the web site in a few weeks so make sure you look for it! Would this be an interesting activity using the web and have your kids find the connections? Send your additions and comments to spacshelby@yahoo.com.

Joe Spaccavento

Where you can get CONCEPT INVENTORIES IN PHYSICS and EARTH SCIENCE

1) You can download the FORCE CONCEPT INVENTORY (FCI/updated version:1995) in English, Spanish, Portuguese, German, Malaysian, Chinese, Turkish, Czech, and Italian at our web site <<http://modeling.asu.edu>>. Click on "Research and Evaluation". Or go directly to: <<http://modeling.asu.edu/R&E/Research.html>>

They are password-protected. (For password: jane.jackson@asu.edu. Put "FCI" in the subject heading.)

Also, links are at that webpage for the Swedish and Russian FCI.

You can download the MECHANICS BASELINE TEST (MBT) in English, Spanish, Portuguese, German, Malaysian, Turkish, and Italian at the same place. Same password.

2) Bob Beichner's website has links to many evaluation instruments in physics. Most are for college level courses. I've included the ones that are useful for high school too. Some are research-based; some aren't. <<http://www.ncsu.edu/per/TestInfo.html>>

Some research-based instruments are:

- * TUG-K: Beichner's Test of Understanding Graphs in Kinematics is available in English, Spanish, French, German, Finnish, and Portuguese.
- * CSEM: The Maloney, van Heuvelen, Hieggelke, and Okuma Conceptual Survey in Electricity and Magnetism (along with a separate test on electricity and another on magnetism). Also at <http://tycphysics.org/CSEM_5_2.htm>
- * DIRECT: Determining and Interpreting Resistive Electric circuits Concepts Test. 29 multiple choice items. By Paula Engelhardt & Bob Beichner.

3) BEMA (Brief E&M Assessment), a research-based instrument.

From: Ruth Chabay <rwchabay@unity.ncsu.edu> (Nov. 2006)

"BEMA (Brief E&M Assessment) can be downloaded from COMPADRE (www.compadre.org). If you search for BEMA you will find two things:

a Phys Rev article on the reliability of BEMA, and a zip file containing the test and a spreadsheet for grading it (this is useful because in a couple of cases a pair of questions is counted as a single question). The password is [email Ruth for the password, in case she's keeping track of who's using it. JJ].

We'd appreciate it if you could observe all the usual precautions with the test (e.g. don't post in an unprotected location; don't discuss answers with students, don't use "BEMA" when administering the test, etc.)

Note that BEMA is not a concept inventory in the same sense that the FCI is. Most students come to E&M knowing very little, but they don't seem to be encumbered by alternative conceptions of the kind common in mechanics. The test simply measures knowledge of basic concepts, and is mostly qualitative."

4) The Workshop Physics site:

<http://physics.dickinson.edu/%7Ewp_web/wp_resources/wp_assessment.html>

I quote from what is there:

"The Workshop Physics Action Research Kit (ARK) consists of conceptual and attitudinal surveys appropriate for use with students who are using Workshop Physics materials. These surveys will help you assess whether your Workshop Physics students have learned the critical concepts and improved their attitudes towards science and learning physics.

The Kit Contains the Following Examinations: The Force and Motion Conceptual Evaluation (FMCE)
The Mathematical Modeling Conceptual Evaluation (MMCE)
The Vector Evaluation Test (VET)
The Heat and Temperature Concept Evaluation (HCTE)
The Electric Circuits Concept Evaluation (ECCE)
The Maryland Physics Expectations Survey (MPEX) "

Reference for FMCE:

Ronald K. Thornton and David R. Sokoloff, "Assessing Student Learning of Newton's Laws: The Force and Motion Conceptual Evaluation and the Evaluation of Active Learning Laboratory and Lecture Curricula," American Journal of Physics, 66:4, 338 (1998). David Sokoloff <sokoloff@oregon.uoregon.edu>

NOTE: THE FMCE ISN'T RESEARCH-BASED like the FCI, in that it doesn't identify specific student conceptions.

5) THE GEOSCIENCE CONCEPT INVENTORY (GCI) was developed by Drs. Julie Libarkin (Ohio University at Athens) and Steve Anderson (Black Hills State University).

Download it at <<http://newton.bhsu.edu/eps/gci.html>> .

It's "a multiple-choice assessment instrument for use in the Earth sciences classroom. We developed a pool of 73 questions that could be selected by an instructor to create a customized 15-question GCI subtest for use in their course. These test items cover topics related to general physical geology concepts, as well as underlying fundamental ideas in physics and chemistry, such as gravity and radioactivity, that are integral to understanding the conceptual Earth..."

Jane Jackson, Co-Director, Modeling Instruction Program
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For 16 years, the Modeling Instruction Program has been helping teachers attain knowledge and skills needed to benefit their students. Modeling Instruction is the only high school science program recognized as Exemplary by the U.S. Department of Education.

Submitted by: Joe Spaccavento

AAPT Summer Meeting

This is the final reminder of the Summer Meeting of the AAPT, July 28 – Aug. 1 in Greensboro, SC. Registration for the meeting and a schedule of events is posted at: www.aapt.org. If you miss this one, your trip next summer will be to Edmonton, Alberta, Canada. For most the drive to Greensboro is about 550 miles and there is a lot to do in the area.

You can sign up for workshops, meet teachers from all over the world, have a great time at the annual picnic, and recharge the batteries for another year of teaching physics. The experience is well worth the cost. Hurry up and make your plans because lodging is going fast and there are a variety of accommodations for you.

If you journey to NC and you see one of the NJ Section members or officers, say hello and maybe we can get a table up at the picnic to enjoy the hospitality for which the area is known. We look forward to seeing and greeting you at the Summer Meeting.

Bergen Community College Offers Evenings of Astronomy Viewing

The Emil Buehler Trust Observatory at Bergen Community College is open year round for public observing every Saturday evening after dark. Located in the Technology Building, the observatory is staffed by members of the BCC Astronomy faculty and members of the Buehler Columbia Amateur Astronomer's Association. All are welcome any Saturday evening to look through our 16 inch Meade telescopes! Directions to the BCC campus may be found at <http://www.bergen.edu/pages/1690.asp>, a campus map may be found at <http://www.bergen.edu/pages/2096.asp>, and a map of the Technology building is at <http://www.bergen.edu/pages/2117.asp>. Enter the Technology Building through the door under the domes.

Submitted by Paul Grillo

Steamboat SPLASH a hit With Physics Teachers

NJAAPT first's amphibious workshop was enlightening, intriguing and enjoyable. While we were well short of our goal of 40 participants, the 14 loyal, seafaring participants met on the dock for their excursion up and down the majestic Delaware. General Washington even made an appearance on the Pennsylvania side cheering us on! One by one we boarded the Steamboat "S.P.L.A.S.H." and were greeted by our gracious hosts Bart Hoebel, Bob Schuster, Pete Burns, and Captain Tim.

We spent this beautiful sunny morning learning a little about the boat, its history, and its systems. Mixing in some brainstorming and discussion regarding how some of these concepts couple be expanded into student centered activities. As we asked questions relating to the boat, our hosts asked questions relating to our teaching expertise.

Our conclusion was that there are so many different possible areas to study, a "menu" could be developed and the individuals planning the trip could pick the area's they choose to focus on for that trip. I believe we were all in agreement that "Less us More" thus an in-depth focus on three or four areas for a trip would be more beneficial that a general overview of more topics.

While this was our first amphibious workshop, it will not be our last! Quoting General McArthur, "I will return!" and this time with a full boat! After returning to the dock a group of us met for lunch and continued our discussion. Another group walked over the bridge to take in the sights and shopping. A good time was had by all! - Joe Spaccavento

Cosmic Ray Workshop

About 25 devoted cosmic soles met at the Rutgers Physics Lecture Hall on a beautiful Saturday morning May 19th, 2007! They were not disappointed! The cosmic rays were zooming around the lecture hall! The was the first in a series of cosmic ray workshops that will go well into next year and result in the construction, sharing and implementing a group of coincidence cosmic ray detectors by New Jersey High School Physics Teachers.

The morning began with Dr. Steve Schnetzer of Rutgers with an introduction to the physics of cosmic rays and possible sources of various energies of cosmic rays. Dave Maiullo then presented two

cloud chambers, which enabled participants to visually observe cosmic rays as well as other types of ionizing radiation. Steve then discussed how cosmic rays are produced and how the detectors that we will be building detect them. He then presented the one detector we had already assembled, with at least seven more in the plans, all being funded by QuarkNet.

Our next speaker, Dr. Andy O'Neil, from Columbia University presented some past experience with Cosmic Ray Detectors in NYC Schools. It was interesting because what Dr. O'Neil felt was a weakness of his program, I believe will be a strength of ours. Then it was my turn, Joe Spaccavento, your New Jersey QuarkNet Teaching Fellow presented what might be the jewel of the entire project, the QuarkNet e-lab. (<http://quarknet.fnal.gov/grid/>) An online forum and work area for sharing and evaluating detector data! This tool opens up huge opportunities for collaborations on a small and large scale. Joe will spend about 10 days at Fermilab this summer, some of that time will be spent becoming fluent in e-lab! In the mean time, check it out yourself, you can e-mail me for the user name and password if interested.

As the morning ended, we broke for a box lunch and sat down to our lunchtime speaker, Rutgers Professor Gordon Thomson on "Cosmic Rays: the Real Energy Frontier." After some a little discussion we ended the session by announcing our next workshop scheduled for September 29th, details can be found at NJAAPT.org I will also be doing a workshop on cosmic rays at the NJSC in October, details to be announced. You are encouraged to join us, we may not have enough detectors for everyone, but we will share and look for additional funding if we have the interest!

AAPT Planning Retreat for Section Representatives and Area Chairs

Talk about your oxymoron, this meeting was far from being about retreating! It was all about moving forward! More than 65 active AAPT members meet May 23-25 at AAPT headquarters at the "Center for Physics" for a Governance Planning Retreat. The participants included the 18 area chairs, close to 40 section representatives or designees, and a number of board members and officers. We explored and discussed more effective ways for the central organization to support its sections and area committees, and ways for the sections and the area committees to be more engaged in advancing AAPT's mission.

As your New Jersey Section Representative it was an honor and a privilege to represent you at the meeting. There were many issues discussed over and over again, and a great deal of progress was made. The concept that the AAPT should be the leading voice for Physics Education in the US was a strong one, and expanded to beyond our national boundaries as we continue to grow internationally as the leading voice for Physics Education in the World.

A major area of discussion was in the area of communication! This seemed to be a common theme coming from all directions that lines of communication between Sections and the National Office, and Sections to Sections, need to be improved and expanded. Several plans and models were constructed to serve this need. Work is underway for detailed reorganization of the communication infrastructure.

Other concerns involved the differences between high school members and college/university members. Let me assure you that there are no plans to eliminate either the summer or winter meeting. Let me further inform you that there is a good possibility that in the near future there will be an expanded tier structure in place regarding membership fees based on the type of membership and journals desired.

Let me take a moment now and urge any of you who are just currently members on NJAAPT (\$25 for 3 years) and not a member of AAPT to follow these membership changes and give AAPT a chance to serve you. If you have never been to a National Meeting Greensboro, NC is a great road trip! The Baltimore meeting this winter is only 3 hours away from North Jersey. If you have any questions about attending a national meeting drop me, or Ray, or any executive board member an e-mail.

Any section members who have never been members of AAPT are still eligible to receive a **6-month free trial membership** in the AAPT with online journals. If this is you, I need you to fill out a

form and return it to me, so send me an e-mail, and I will e-mail it back to you to fill out and sign, then return it to me via snail mail so I can sign it and verify that you are a section member in good standing.

One final note, make sure to support your sections efforts at the New Jersey Science Convention in October, visit our table, better yet, volunteer an hour or two to sit at the table and talk to teachers. Participate in our “Demo Dens” or just watch. Make sure to attend our Physics Teacher roundtable session to discuss current issues. Try to attend member’s workshops; I will be part of 5 different presentations, the Roundtable, a Physics Modeling session with Janet Saylor, finding the “Mass of the Top Quark” activity from Fermilab, Cosmic Rays basics and detectors, and Nuclear Power Primer – What the Future Holds! I am always looking for co-presenters, just send me an e-mail. Have a great summer and keep checking the webpage for updates and announcements! Don’t just be a member, be an active member!

Joe Spaccavento
NJAAAPT Section Rep