

## *"Science and the Environment*

### Fall Meeting of the Illinois Section of the AAPT

October 12-13, 2007

Lincoln Land Community College, Springfield, Illinois

Friday, October 12, 2007

**9:30 - 5:00**     **Registration. Art Gallery (Menard 2211).** Please make checks payable to "ISAAPT".

**Please Recycle.** When you leave the meeting to return home, please place your plastic name tag holder in the designated box. These holders will be used at the next meeting. Thanks.

**10:00 - 12:00**     **Workshop W1. "New Developments in MBL",** Pasco Scientific, Sangamon 2211.

**10:30 - 12:00**     **Workshop W2. "A Natural -- Nuclear Physics, Nuclear War. Is It Missing from Your Physics Curriculum?"**, Ray Wilson, Illinois Wesleyan University, Sangamon 2209.

**10:30 - 12:00**     **Workshop W3. Cracker Barrel Discussion: "Preparation of Illinois High School Physics Teachers"**, Carl Wenning - Discussion Leader, Illinois State University, Sangamon 1122 (Library Conference Room).

**12:00 - 1:00**     **Lunch** - on your own (Union Food Service, Lower Level of Menard Hall)

<b>Here is a list of those who are doing contributed presentations.</b>			
<b>Friday, 1:30 - 2:45</b>		<b>Friday, 4:15 - 5:00</b>	
1:30	A1. <a href="#">Erin Stefanik</a>	4:15	B1. <a href="#">Curt Hieggelke</a>
1:45	A2. <a href="#">John Metzler</a>	4:30	B2. <a href="#">Dean Sieglaff</a>
2:00	A3. <a href="#">Tom Foster</a>	4:45	Take 5's: Dave Sykes
2:15	A4. <a href="#">Zak Knott</a>		Rob Mason
2:30	Take 5's: Dave Sykes Cliff Parker		Rebecca Wenning-Vieyra
<b>Saturday, 8:45 - 9:45</b>		<b>Saturday, 11:15 - 12:00</b>	
8:45	C1. <a href="#">Andrew Johnson</a>	11:15	D1. <a href="#">Carl Wenning</a>
9:00	C2. <a href="#">Bill Hogan</a>	11:30	D2. <a href="#">Sadri Hassani</a>
9:15	C3. <a href="#">Shane Hanson</a>	11:45	D3. <a href="#">Rick Pearce</a>
9:30	WITHITs	12:00	Take 5's: Deb Lojkutz James Rabchuk

**1:30 - 2:45 Session A - Menard 2207** - Chair: William Hogan, Joliet Junior College

**1:30 - 1:45 - A1** - Other

**The Importance of Scientific Literacy.** [Erin Stefanik](#), Illinois State University, Normal, IL 61761. The presentation will be about scientific literacy. It will describe its importance to our society as a whole and why we need to be a more scientifically literate as a nation. It will discuss how learning physics can help to promote scientific literacy. Most importantly as physics teachers how we can do a better job to promote this in our students and what ways this may be accomplished.

**1:45 - 2:00 - A2** - Other

**Learned It From Carl: Preparing to be a Physics Teacher.** [John Metzler](#), Illinois State University, Normal, IL 61761. Since ISU is one of the leading schools in the nation for preparing high school physics teachers, it is important to look at what the teacher candidates must go through in order to be called the best. From a student's point of view, this presentation will look at what preparing to be a physics teacher really boils down to.

**2:00 - 2:15 - A3 - Research**

**Investigating Problem-Solving and WebAssign: Recruiting and Study Design.** *Tom Foster* and *Thomas Withee*, Southern Illinois University Edwardsville, Edwardsville, IL 62026. Computer aided instruction is making its presence felt across the nation. We have animations, lab acquisition, and now internet-based homework delivery systems. All these wonderful tools which can leave you wondering about their quality. For this research project, we are specifically examining the impact WebAssign has on student problem-solving skills. WebAssign is a nationally available internet-based homework delivery system with nearly every textbooks' end-of-chapter problem available. They are providing free access to those high school teachers who volunteer and meet our criteria. For this presentation, we will share our trials and tribulation in setting up the study. No data yet, but already plenty has been learned. Information on volunteering will be distributed at the meeting. Contact the author for information on how to volunteer if you cannot attend.

**2:15 - 2:30 - A4 - Teaching Methods**

**What Is GeoPhys?** *Zak Knott*, Hinsdale South High School, Darien, IL 60561. Hinsdale South High School will soon be asking most of its freshman to enroll in a course titled "GeoPhysics". We believe that this course will present students with an excellent opportunity to increase their understanding of science while simultaneously laying the groundwork for future science courses. I will discuss why this choice was made as well as the challenges it has created for us.

**2:30 - 2:45 - Take Fives - Menard 2207**

1. *Dave Sykes*, "News Gone Awry"
2. *Dave Sykes*, "Magnetic Potential Energy?"
3. *Cliff Parker*, "What Part of a Candle Burns?"

**2:45 - 3:00 - Break - Art Gallery**

<b>3:00 - 3:05</b>	<b>Welcome - Menard 2207 - Dr. Eileen Tapatti, Vice President, Academic Services, LLCC</b>
<b>3:05 - 4:00</b>	<p style="text-align: center;"><b><i>Panel Discussion: "On the Ramifications of No-Child-Left-Behind"</i></b></p> <p style="text-align: center;"><b>Panel members: Troy Gobble, Elizabeth Langford, and Diana Roth</b> <b>Moderator: Dave Sykes</b></p> <p style="text-align: center;"><b>Menard 2207</b></p> <p>No-Child-Left-Behind (NCLB) legislation has caused sweeping changes to education from kindergarten to 12<sup>th</sup> grade and, without a doubt, has been controversial. In this panel discussion, several high school physics teachers will reveal their perspective on the impact to physics teaching of NCLB.</p>

**4:00 - 4:15 - Break - Art Gallery**

**4:15 - 5:00 Session B - Menard 2207 - Chair: Ken Mellendorf, Illinois Central College**

**4:15 - 4:30 - B1 - Teaching Methods**

**nTIPERs-an introduction.** *Curtis Hieggelke*, Joliet Junior College, Joliet, IL 60431, *David Maloney*, Indiana University -Purdue University Fort Wayne, Fort Wayne, IN 46805, *Steve Kanim*, New Mexico State University, Las Cruces, NM 88003-8001. This paper will describe a new project to provide various tasks in a variety of formats designed to improve student learning and understanding of Newtonian mechanics. These tasks are based, in part, on efforts in Physics Education Research and thus are called nTIPERs (Newtonian Tasks Inspired by Physics Education Research). These tasks support active learning and provide an easy way of updating traditional lectures. This talk will describe the current status and future plans including the development of "iclicker"-nTIPERs. This is a collaborative project between Joliet Junior College, New Mexico State University, and Indiana University-Purdue University Fort Wayne that is supported in part by a CCLI grant from the Division of Undergraduate Education of the National Science Foundation (Grant #0632963).

4:30 - 4:45 - B2 - Teaching Methods

**Systematic Daily Use of Classroom Response Technology in Introductory Physics.** *Dean Sieglaff*, Augustana College, Rock Island, IL 61201. Classroom response technology (CRT) increases teaching effectiveness because it allows student participants to engage key questions of the lesson. Through the act of committing to a response, each student can reveal their own conceptual gaps and become more receptive to the principles as presented in the lesson. Incorporating CRT into the class time agenda is however challenging due to constraints of time and money. Simply adding CRT "on top of" existing, traditional in-class methods of instruction can lead to frustration. Hence the question of CRT use is not "should we do it?" but "how should we do it?" We present a strategy to build an in-class experience around the CRT as a central motivation for discussion and activity, each and every lesson. Our approach is grounded in the best practices of CRT use but utilizes a simple in-class agenda, repeated from lesson to lesson, that everybody can live with.

4:45 - 5:00 - Take Fives - Menard 2207

1. *Dave Sykes*, "Super Cool Supercooling"
2. *Rob Mason*, "Magnets and Liquid Oxygen"
3. *Rebecca Wenning-Vieyra*, "Barbie Bungee Jumping Paradigm Lab"

5:00 - 6:00 - Free Time

6:00 - 7:30 - Banquet - Robert H. Stephens Room (Menard 1286). Presentation of the *Distinguished Service Citation*. Drawing for door prizes.

7:30 - 8:30	<p style="text-align: center;"><b>"Confronting Global Warming"</b></p> <p style="text-align: center;"><b>Dr. Don Wuebbles</b> Director, School of Earth, Society, and Environment Professor, Department of Atmospheric Sciences University of Illinois, Urbana-Champaign <b>Trutter Center</b></p> <p>It's in the news, but many Americans remain unclear about what is happening to our climate, the "expected" weather, and its variability. The American public is still too unaware of the potential impacts of these changes on their lives and on future generations. Nonetheless, the available evidence strongly indicates that human activities are playing a significant role in bringing about climate change, especially in the last few decades of the 20th Century and the first seven years of the 21st Century.</p> <p>Significant changes in climate as a result of these human activities are projected for the rest of the 21st Century and beyond. The scientific analyses also strongly indicate that the globally-averaged temperature increase is resulting from rising atmospheric levels of radiatively important (mostly heat-trapping) gases and particles, lending credence to concerns about much larger changes in climate being predicted for the coming decades.</p> <p>Computer-based analyses of the complex physical, chemical, and biological processes affecting the climate system, backed by direct observations of these processes, have implicated human activities, especially the burning of fossil fuels along with land use changes, as major factors in the increasing concentrations of the heat-trapping gases and particles. Analyses of the climate system also indicate that, without major policy or technology changes, the climate will continue to grow warmer over most of our planet.</p> <p>This presentation begins with a discussion of the current understanding of the concerns about climate change and the role being played by human activities, then examines several of the potential resulting impacts on humanity and our planet, and finishes with a short discussion of our possible responses to this all too real issue.</p>
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*Saturday, October 13, 2007*

**7:30 - 8:30 - ISAAP Council meeting** - Presiding: Troy Gobble, President. Menard 2215.

**8:30 - 10:30 - Registration. Art Gallery (Menard 2211).** Please make checks payable to "ISAAP".

**8:45 - 9:45 Session C - Menard 2207** - Chair: Deb Lojkutz, Joliet West High School

**8:45 - 9:00 - C1** - Active Learning

**Demonstrating the Principle of an rf Paul Ion Trap.** *Andrew Johnson*, Western Illinois University, Macomb, IL 61455. An rf ion trap uses a time-varying electric field to trap charged ions. This is useful in applications related to quantum computing and mass spectroscopy. There are several mechanical devices described in the literature which have attempted to provide illustrative demonstrations of the principle of rf ion traps, including a mechanically-rotating "saddle trap" and the vertically-driven, inverted pendulum. Neither demonstration, however, successfully demonstrates BOTH the sinusoidal variation in the electric potential of the rf trap AND the parametric stability of the ions in the trap described by Mathieu's equation. We have modified a design of a one-dimensional ponderomotive trap presented earlier so that it satisfies both criteria for demonstrating the principle of an rf Paul trap. We also present several design alternatives for constructing such a trap. Finally, we explore several experiments that might be carried out using such a device.

**9:00 - 9:15 - C2** - Teaching Methods

**Taking Lenz's Law Seriously.** *Bill Hogan*, Joliet Junior College, Joliet, IL 60431. I've recently made some changes to how I approach Lenz's Law in my algebra/trig based introductory course. I will discuss the changes I have made and how my students have responded. I hope this talk will lead to a discussion with those in attendance about how others approach this topic.

**9:15 - 9:30 - C3** - Active Learning

**Problem Based Learning.** *Shane Hanson*, Illinois State University, Normal, IL 61702. Problem Based Learning (PBL) is a powerful tool to use during the teaching of physics. PBL promotes a variety skills and knowledge within the student by developing true problem-solving abilities, building multi-disciplinary knowledge, integrating knowledge from a variety of disciplines, assisting in values clarification, and helping the student to see the utility of science and apply what (s)he knows about science to real-life situations. PBL does this by placing students in active roles as problem solvers, confronting students with an ill-structured problem, and introducing students to real-world problem solving.

**9:30 - 9:45 - WITHITs - Menard 2207**

1. *Bill Hogan*
2. *Zak Knott*
3. *Cliff Parker*
4. *Rebecca Wenning-Vieyra*
5. Any others?

**9:45 - 10:00 - Break - Art Gallery**

<b>10:00 - 11:00</b>	<p><b><i>"Developments in Coal Burning Power Plants"</i></b></p> <p><b>Mr. Patrick Giacomini</b> Professional Engineer, City, Water, Light, and Power Springfield, Illinois <b>Menard 2207</b></p> <p>During the past few decades the environmental controls for coal burning power plants has gone from non-existent to significant due to society's awareness of the effects of pollution. In this talk the operation of coal burning power plants, along with the devices used to control pollution, will be presented.</p>
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**11:15 - 12:00 - Break - Art Gallery**

**11:15 - 12:00 Session D - Menard 2207** - Chair: Tom Snyder, Lincoln Land Community College

**11:15 -11:30 - D1** - Other

**Recruiting the Next Generation of High School Physics Teachers.** *Carl J. Wenning*, Illinois State University, Normal, IL 61790-4560. The ISAAPT Ad Hoc Committee for the Recruitment, Preparation, and Retention of High School Physics Teachers was established in 2004. Since that time the Committee has met several times, conducted in-depth analyses, held a workshop and a cracker barrel discussion, and made a series of recommendations in a published report. The Committee has recently produced a recruitment booklet for teachers, a tri-fold brochure for students, and two follow-up Web pages. This has been done in cooperation with three other Illinois science teacher associations. The presenter will provide access to these materials for the first time, and explain their use in recruiting the next generation of high school physics teachers.

**11:30 -11:45 - D2** - Other

**Science Literacy: How Santa Claus can help.** *Sadri Hassani*, Illinois State University, Normal, IL 61790. I will make an audio visual presentation of the motion of Santa Claus as related to his energy consumption. This can also be tied to certain symptoms of science illiteracy and how the analysis of Santa's motion can help make students aware of these symptoms.

**11:45 -12:00 - D3** - Other

**Illinois Articulation Initiative Physics Advisory Committee update.** *Rick Pearce*, Illinois Board of Higher Education, Springfield, IL 62701. A brief update on the work of the Physics Advisory Committee to the Illinois Articulation Initiative of the Illinois Board of Higher Education

**11:45 - 12:00 - Take Fives - Menard 2207**

1. *Debbie Lojkutz*, "What's Wrong with My Popper?"
2. *James Rabchuk*, "Teaching Physics for Society from Hobson"

**12:10 - 1:00 - Lunch** - *It must be ordered with Registration.* **Menard 2207**

**Business Meeting** - Election of Council Members and Officers, Treasurer's Report.

**1:00 - 1:30** Meeting of the Program Committee for the Spring 2008 meeting at Champaign

**Last update: October 10, 2007**

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