

**OUR NEXT MEETING...**

...is at Lane Technical High School, Chicago

Thursday

February 16, 2012

**NOTE THE EARLY STARTING TIME****5:30 pm to 8:00 pm****Scroll down for directions and a map**

<b>Future Meetings</b>			
Feb 27- Mar 2	(Mon-Fri)	APS March Meeting	Boston, MA
March 7	(Wed)	Loyola U.	Gordon Ramsey
April 28	(Sat)	CSAAPT, Thornton H S, Harvey	
Mar 29-Apr 1	(Thu-Sun)	NSTA National Meeting	Indianapolis
March 30-31	(Fri-Sat)	ISAAPT, University of Illinois	Champaign-Urbana
April 17	(Tue)	Lake Forest College	Bailey Donnally/Mike Kash/Scott Schappe
May 7	(Mon)	Niles West H S	Martha Lietz
May 15	(Tue)	Physics Day @ Great America	Krystal Bern (or Nate Unterman) (kbern@sftp.com)
June 5	(Tue)	MSI (& annual Host Meeting)	Ruth Goehmann

**AT OUR LAST MEETING,,,**

...the 28<sup>th</sup> annual Tri-Physics Meeting at Elmhurst College, we were greeted by our host **Brian Wilhite**, who introduced his colleague **Venkatesh Gopal**.

First-time attendees were introduced, and three new teacher bags were presented.

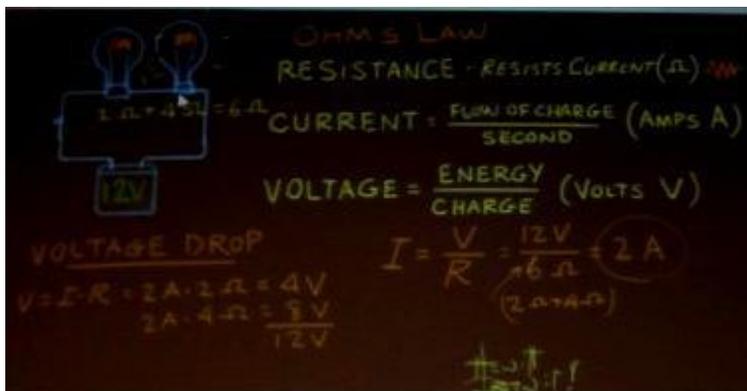
**Arie Van Ek** (Illiana Christian High School) brought out a radio control helicopter he obtained for \$25 and demonstrated its capabilities. Then we discussed some of the physics involved. The two rotors rotate in opposite directions, and their relative speeds determine whether it hovers, rises, or descends. The tail rotor is vertical and controls forward and backward movement,



**Bruce Medic** (Glenbard West High School) uses the book *The Physics of Superheroes* to enhance his students' appreciation of physics. He showed us some pages from the book relating to the comic character Radioactive Man. He said that this book is at a high school reading level. Then he told us about a Chapter Outline technique he used with his students. The instruction sheet he gave us tells the students how to outline a text chapter; they are expected to turn in the outline at the time of a test. On average, test scores were higher than those of students from previous years on the same material.

**Bob Froehlich** (Glenbrook North High School) showed us an adaptation of the traditional PSSC centripetal force lab. The student holds a glass tube and swings a rubber stopper that moves in a (nearly) horizontal circular path. A string connects the stopper to a hanging mass whose weight equals the centripetal force. Bob constructed a wooden support to hold a Vernier or Pasco force probe that replaces the stopper and records the centripetal force. He gets a good fit to the data. Next Bob showed us a phase cancellation circuit he constructed. We could hear this effect when he shifted the feed to a pair of speakers from in phase to out of phase.

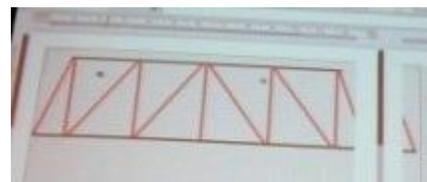
**Marshall Ellenstein** (Maine West High School) showed us a *screencast*, similar to those found at the Khan Academy (<http://www.khanacademy.org/>). This is one of several narrated by Paul Hewett, to be made available for iPhone and iPad, as well as Youtube. This one is a presentation on basic DC electric circuits, beginning with a brief history of Ohm's Law and moving through units for potential difference, current and resistance, and the application of Ohm's law to series and parallel light bulb circuits, with some numerical examples. Reaction was positive, though several people made suggestions for changes in the format that could make it clearer.



**Nick Szarzak** (Glenbard West High School) showed a PowerPoint he put together on color mixing. Then he brought out an *Airzooka Air Gun* (\$12.99 from Minecraft, available from several sources on the web). It launches "airballs" produced by pulling back and releasing the plastic membrane at the back of the instrument. Next we saw an online Powers of 10 applet made available from Molecular Expressions at Florida State University (<http://micro.magnet.fsu.edu/primer/java/scienceopticsu/powersof10/>). There is a \$19.95 machine license available, Nick gave us information about three books he has found useful for his teaching. *Physics for Poets*, 5<sup>th</sup> edition, by Robert March is a quick read, at a level between a standard intro text and a Hewitt text. *Insultingly Stupid Movie Physics* by Tom Rogers, available as a paperback and an ebook, as the title suggests, describes bad physics in movies. Nick showed us some excerpts from *A Short History of Nearly Everything*, by Bill Bryson, such as the effects of gazing directly at the sun.



**Martin Kulak and Kevin Shane** (Conant High School) demonstrated the path of a particle released from a circular motion path. Martin put a steel ball inside an embroidery hoop, rotated the hoop, then lifted it to free the ball, which moved off at a tangent from the point of release. He repeated this, using a larger hoop cut from a



laundry basket. Kevin rotated an inflated balloon with a penny in it and was able to make the penny execute uniform circular motion along the inside surface of the balloon. Martin showed us an Excel spreadsheet he devised that prints a template for basswood bridges, making use of the 1/8" x 1/8" squares on the Excel screen printout. ([mkulak@d211.org](mailto:mkulak@d211.org))

**Ann Brandon** (Joliet West High School) summarized the important role of the late **Harald Jensen** in founding and supporting ISPP, and announced that this year's winner of the **Harald Jensen Award** is **Andrew Morrison** of Joliet Junior College. The award will be presented at the Lake Forest College meeting, April 17. Congratulations, Andy. Ann gave us two handouts, puzzles and brainteasers from Games Magazine, April 1986.

**Jim Vokash** (Hinsdale Central High School) hung a hook with an attached magnet from a string and brought the magnet near a board on which several magnets were arranged somewhat irregularly. The hanging magnet moved in a random pattern as the board was moved. Someone suggested that a laser attached to the hook might be a means of observing the pattern.



**John Lewis** (Glenbrook South High School) and **Scott Beutlich** (Crystal Lake South High School) brought some glow-in-the-dark flash paper. John mentioned that strips of this material are used to identify safety workers. He illuminated a sheet with a purple laser (405 nm) and with a strobe flash. A “volunteer” was asked to trace the pattern of a maze on this paper by looking at the reflection of the maze rather than at the maze itself and we saw the difficulty moving in the correct direction at the corners of the maze. John and Scott also showed us some unusual effects of illuminating liquids with the 405 nm light. (He used tonic water, water samples in which red dye and a fluorescein dye tablet had been dissolved and we saw some total internal reflection effects.) John used a Pasco

projectile launcher to launch a small snowball and Scott followed with a crossbow-type toy that launches projectiles.



**Paul Dolan** (Northeastern Illinois University) bought a multiple foam dart projectile launcher and a refill pack from Buzz Bee Toys. The darts have suction cup ends. The launcher, one of several models, has quite a range.

**Brian Wilhite** passed out fliers regarding the **Great America Physics Day, May 15**. Teachers can apply for two free passes.

**Josh Nortan** (Cary-Grove High School) said his school is exploring the possibility of high school level online learning and asked those with some interest and/or experience to fill out a form about this.



**Max Lee** (Joliet Junior College) showed us some rotating toys. One consisted of a series of wooden ducks that move up and down when connected by strings to a rotating ball. Two other toys were spinning tops with flashing LEDs. The tops played musical notes as they rotated.



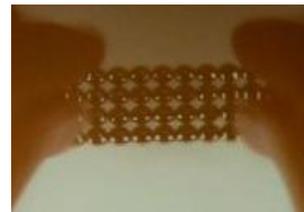
**Ron McLean** (St. Benedict High School) brought some thunder tubes. One was from Remo, the other he made from a large cylinder and an old slinky. Shaking the tube produces a thunder-like sound, and pulling on the connected string produces a sound like a creaky door

**Kevin McCarron** (Oak Park-River Forest High School) did a quick Doppler Effect demo. He and a partner stretched a slinky between them. When he grasped a section in the middle and pulled it towards him we saw that the links between him and the section he held were closer together (representing shorter wavelength) and the links on the other side were farther apart (longer wavelength). He moved the section he held in the opposite direction (source moving away from the observer). What do you think we saw? Try it.

He used a 2"×2" stick with a nail without a head at one end to launch a small spring into a cd case he had cut to receive it. The case was mounted on soda straws. We could see the inelastic collision produced. Someone suggested hanging the case, as in a ballistic pendulum. Then if the initial velocity of the spring could be measured, it should be possible to predict the maximum height reached by the case.

**John Milton** (De Paul University, retired) showed us a “Laser Ray Box and Lenses” kit (Arbor Scientific, \$99). It comes in a metal storage case containing a ray box (1, 3 or 5 parallel rays), acrylic lenses, a flexible mirror (can be made concave or convex), a hollow semicircular dish and a protractor scale on which the pieces may be placed. An overhead view camera can be used to display optical ray phenomena to a class.

**Martin Melhus** (Benedictine University) showed us a collection of small magnetic beads that can be arranged in many ways to stable charge configurations. They tend to go to lower energy states. He was able to join 60 of these beads in a “soccer ball” arrangement. There are many web sources, and they can be found at Hallmark and convenience stores.



Our thanks to **Brian Wilhite, Venkatesh Gopal** and their helpers from Elmhurst College for an enlightening physics-philled evening.

Reported by John Milton.

**LANE TECHNICAL HIGH SCHOOL**  
**2501 West Addison Street**  
**Chicago, Illinois 60618**  
**(773) 534-5400 Fax (773) 534-5544**

If you are traveling city streets: Addison Street is 3600 North; Western Avenue is 2400 West.

**Using the CTA:**

The Brown line stops at Addison and Ravenswood. Lane Tech is about a mile west at Western; the #152 Addison bus can take those of us not training for the marathon. From the North and South, the #49 Western bus runs right past us.

**From the South:**

Take Lake Shore Drive North and exit at Belmont Avenue. Go west on Belmont (L) until you reach Western. Go north on Western (R). Turn left into Lane's lot after you go through the Roscoe intersection. If you get to Addison you have gone too far.

OR

Take the Dan Ryan Expressway North (I90). It becomes the Kennedy Expressway after you pass Downtown. Exit the Kennedy at Fullerton/Western (47A). You will drive through the first stoplight to get to Western Avenue. Go north on Western (R). Turn left into Lane's lot after you go through the Roscoe intersection. Make a left turn into the parking lot. If you get to Addison, you have gone too far.

**From the Southwest:**

Take the Stevenson Expressway (I55) North and follow the exit for I90/94 Wisconsin. This will put you on the Dan Ryan Expressway North. Follow the Directions above from here on in.

**From the North:**

Take Lake Shore Drive South, exit on Irving Park Road. Go West on Irving (R) until you reach Western. Go south on Western (L). After you go through the Addison Street intersection and pass the school building, make a right into the Lane lot.

**From the Northwest:**

Take the Edens South to the Kennedy Expressway East. Exit at Addison (L). Go east on Addison until you reach Western Avenue. Go south on Western (R) and turn right into the Lane lot after you pass the school building.

OR

Take Kennedy eastbound to Addison St. exit. Go eastbound on Addison to Western. Turn south on Western (R) one block to the parking lot entrance. Turn right.

**From the West:**

Take the Eisenhower Expressway (I290) east to the Kennedy. Follow the directions for the Kennedy Expressway West from above.

**Directions from I-94:** Exit at Addison, go east until Western; turn right (south) at Western.

**Directions from Lakeshore Drive:** Exit at Irving Park, go west until Western; turn left (south) at Western.

The parking lot entrance is on Western, just north of the Jewel parking lot. Enter the building through door "M" which is the parking lot door. There will be signs from there.

