ISPP REMINDER

December 2012

OUR NEXT MEETING…

…is at
Elmhurst College
Wednesday January 23
5:30 pm Pizza
6:30 – 9:00 pm Meeting

Go to the last page for a map and directions.

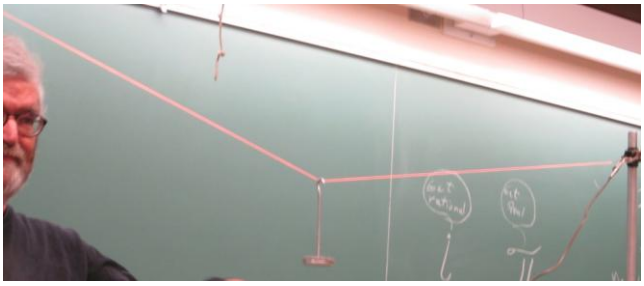
FUTURE MEETINGS…

Feb 11 (M) NEIU (Paul Dolan)
March 6 (W) Loyola U (Gordon Ramsey)
March 16? (S) CSAAPT – Glenbard South?
Apr 10 (W) Lake Forest College (Bailey Donnally/Mike Kash/Scott Schappe)
May 6 (M) Northwestern University (Art Schmidt)
June 4 (T) MSI, tentative (Ruth Goehmann)

AT THIS MEETING…..

We were welcomed to DePaul by Dr. Jesus Pando, the chairman of the Physics Department.

John Milton (retired, DePaul University) started the meeting by showing us a demonstration of a laser image on the board and leading a discussion of the fallacy of the persistence of vision being responsible for a series of images. Useful links: http://www.mediacollege.com/glossary/p/persistence-of-vision.html, http://redwood.colorado.edu/acdavis/capstone/persistence7.html, and on Google, click on: [PDF] the myth of **persistence of vision** revisited - Academic Program ...



Tom Senior (Lake Forest College) suspended a mass from the center of a nichrome wire stretched between two posts. He used a VariAC to provide current to the wire and as the wire heated, it started to glow, and the hanging weight descended. This happened because the wire expanded as it was heated. Then he turned the current off, and the wire cooled and the hanging mass rose. Tom also discussed how this demonstration could be used to discuss Newton's Law of cooling. When the current is initially turned off, the wire cools rapidly, so the weight rises rapidly. But then as the cooling slows down, as the wire approaches equilibrium, the rising of the weight slows down.

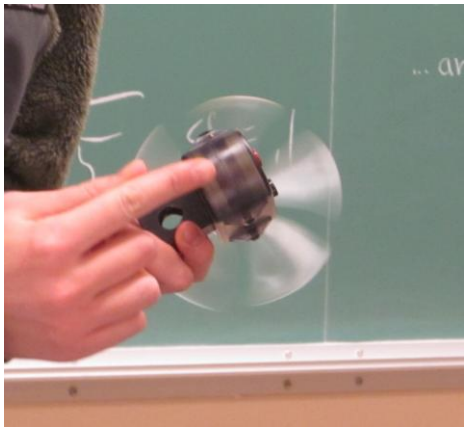
Scott Welty (Harper College) demonstrated Archimedes principle for us. He had filled the bottom of a 2-liter bottle (with the top cut off) with cement. He then floated that in a container designed so the water that was displaced could be collected in a separate bucket. The cement object and the bucket were suspended from a beam. When the cement object is lifted out of the water, the bucket and the cement balanced, demonstrating conclusively that the weight of the displaced water is the same as the weight of the floating object. Very nice job, Scott.

Susan Fischer (DePaul University) showed us several demonstrations she uses to have students feel what is going on with torque. The first one involved hanging a mass on one side of meter stick balanced on a pivot, and using their fingers to push on the other side and balance the torque by the hanging mass. As a student runs his or her fingers in closer to the pivot, the force applied can be felt to get larger. The student then has a tangible sense of how, with a smaller radial arm, the force required for balancing becomes much larger. Susan then demonstrated how to find the center of mass of a meter stick by balancing it on both index fingers, moving them slowly together until they meet at the "balance" point. She then demonstrated how she added a mass (equal to that of the meter stick, as it turned out) and used the same method to find the balance point of the combination of meter stick and added mass. What a neat way to demonstrate conceptually the center of mass of a complex system! Thanks, Susan!

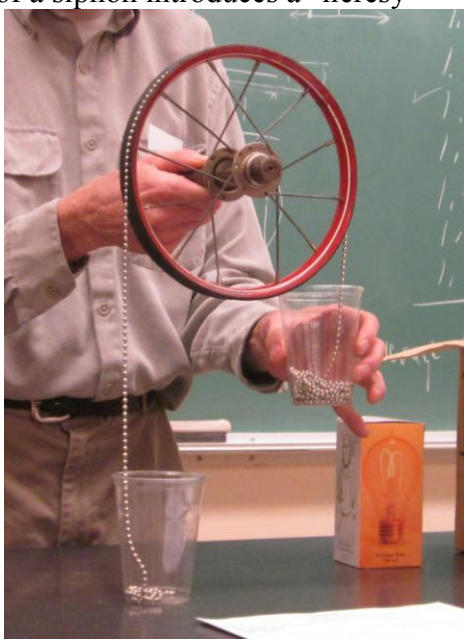
Martha Lietz (Niles West HS) brought in some BeeSpi V photogates that can be used to measure the speed of objects which pass through them. There are two beams in the small device ($60 from Arbor Scientific, http://www.arborsci.com/beespi-v-photogate-timer) a fixed distance apart and thus the speed of an object (such as a steel marble or HotWheels car) can be measured without measuring that object's diameter or length. An impromptu attempt was made to measure the speed of a ball at the top of a loop, but success eluded us. More uses to come in the future.

Pete Insley (retired, Columbia College) reprised his golden rectangle demonstration for us, this time with two squares. He had two squares of paper which he attached to the board with magnets. He then pulled one square from behind the other and had us vote on when the small section of rectangle seemed to have the same "aspect" (or ratio of sides) as the larger rectangle. We then divided the length of the rectangle by the height of the rectangle and reported the ratio to the group. Our average ended up being slightly smaller than the golden ratio. We then calculated the exact value using algebra and geometry. Thanks, Pete, for giving us a way for our students to visualize this important number!

Stacy Ewing (Latin Jump Program) showed us the Energy Transfer Generator (PASCO) she uses with her eighth grade students to discuss solar and wind energy. She also showed us a template of a demonstration log she uses with her students. She has a table that has a column for what she is doing, a column for the students' predictions, and then a column for the observations the students make, either with the naked eye, or with a high-speed camera (which she hopes to obtain in the near future). She then ran through (verbally) a sequence of demonstrations she hopes to use with her energy transfer generator. Thanks, Stacy!



Art Schmidt (Northwestern University) demonstrated a Tantalus cup for us: it uses a siphon to ensure the user drinks only in moderation. If the cup is too full, the liquid quickly empties out the bottom. He then showed us a "model" of a siphon using a small bicycle wheel and some ball chain from a hardware store. The chain piles in one cup, runs up and over the wheel down the other side and piles in another cup. When one cup is raised, the wheel begins to turn and the chain empties out of the higher cup and into the lower cup. Art then discussed how this mechanical model of a siphon introduces a "heresy" into the definition of a siphon. A siphon depends on the pressure of the atmosphere to work, whereas operation of the chain hanging over the bicycle wheel depends only on the weight differential on each side.



Art then hooked an old light bulb with a long filament to a demonstration device he got from Arbor Scientific (http://www.arborsci.com/electricity-and-magnetism-light-bulb-demo). The device can be switched so the bulb gets either a DC current or an AC current. He then brought a magnet up to the filament and showed the deflection of the wire filament with current through it. He discussed that even though the force on the AC current may be small, conditions can be made right so that resonance can occur and the amplitude of the oscillations increased so much as to be made easily visible by students in the classroom.

John Milton then demonstrated the give-away that was a Tippe Top (a top that turns upside down after spinning for awhile) and an article that describes how it works. Thanks, John!

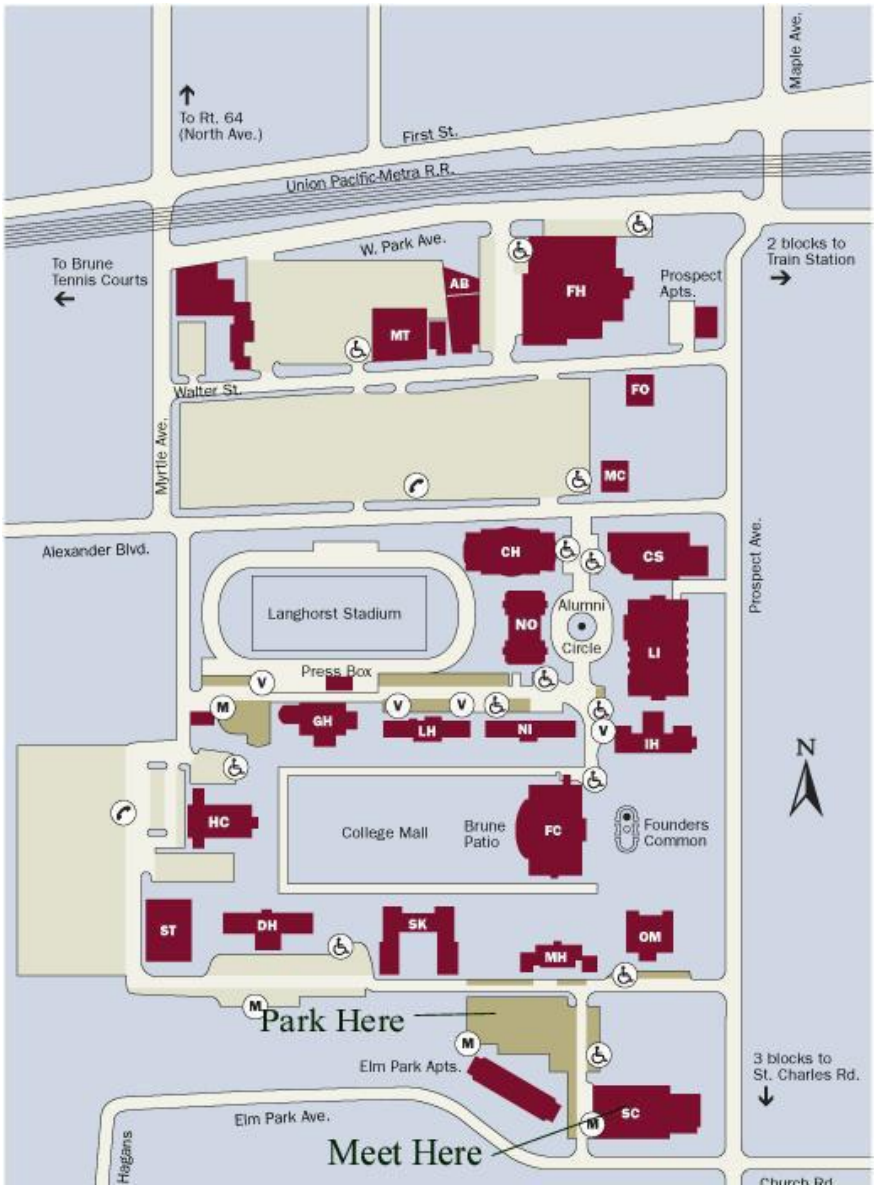
Submitted by Martha Lietz

Map and Driving Directions
Click here

DIRECTIONS TO ELMHURST COLLEGE
By way of Interstate 290 (Eisenhower Expressway) ; Exit at St. Charles Road, just west of I-294;
Travel West on St. Charles, past York Road, to Prospect Avenue ; Turn right onto Prospect for two long blocks, past the front of the campus on your left, to Alexander Boulevard ;
Turn left, then left again, into the main parking lot

By way of Interstate 294 (Tri-State Tollway); From the south, exit at I-290
From the north, exit at I-290 West, then exit again immediately at Illinois Route 64 West (North Avenue)
Follow North Avenue about a half-mile, past York Road, to Maple Avenue ; Turn left. Follow Maple Avenue another half-mile, two blocks past railroad tracks to Alexander Boulevard. (Maple Avenue becomes Prospect Avenue after the tracks); Turn right, then left, into the main parking lot

By way of Interstate 88 (East-West Toll way) ; Exit at York Road, just west of I-294. (Take ramp marked I-294 South); Travel north on York for about two-and-a-half miles to St. Charles Road
Turn left on St. Charles to Prospect Avenue; Turn right on Prospect for two long blocks, past the front of the campus to your left, to Alexander Boulevard; Turn left, then left


To Rt. 64
(North Ave.)
First St.
Maple Ave.
Union Pacific-Metra R.R.
To Brune
Tennis Courts
W. Park Ave.
AB
MT
FH
Prospect
Apts.
2 blocks to
Train Station
Walter St.
FO
Myrtle Ave.
MC
Alexander Blvd.
CH
CS
Langhorst Stadium
NO
Alumni
Circle
LI
Press Box
GH
LH
NI
IH
N
HC
College Mall
Brune
Patio
FC
Founders
Common
ST
DH
SK
MH
OM
Park Here
Elm Park Apts.
3 blocks to
St. Charles Rd.
Elm Park Ave.
SC
Meet Here
Hagans
Prospect Ave.