

OUR NEXT MEETING...

...is at
Loyola University
Tuesday March 7
 6:30 – 9:00

Scroll down for directions and a map link.

FUTURE MEETINGS...

DATE	LOCATION	CONTACT
Chicago Section AAPT - March 18 (S)	Niles North High School	Martha Lietz
April 12 (W)	Lake Forest College	Mike Kash
May 8 (M)	Northwestern University	Art Schmidt

AT OUR LAST MEETING...

...at Lane Tech High School on February 16.

...What a GREAT MEETING! ...We gave out 6 new teacher bags!



...**Julie Smallfield** (Lane Tech) teaches rotational dynamics using a device with four 30cm arms with mountable weights attached to a hub. A weight can be hung at four different places on the hub, giving you four different radii. The students recorded the mass of the weight and the time it takes to fall 1m. Knowing the radius of the hub, the student can calculate linear acceleration, angular acceleration, force, and torque. Graphing torque as a function of angular acceleration gives a nice straight line with the physical meaning of rotational inertia! Very nice.

...**Martha Lietz** (Niles West High School) brought the popper we've seen often before. But this time Martha showed us how to calculate the time the "pop" takes. She measured the height of the popper (about 1.6cm), the height the popper jumps to (about 1m), and the mass of the popper (about 5g).

These measurements allow her to calculate 1) the time of ascent; 2) the velocity leaving the table; 3) the acceleration of the popper as it leaves the table; 4) the force on the popper; 5) the momentum of the popper after the snap; and 6) the time of the snap! Turned out to be about 7ms. She found a video showing the popper snapping taken at 1000 frames and it took 6 or 7 frames. Not bad!

...**Bill Blunk** (Be sure to read this one carefully – it was really “neat.”) Bill brought the old phoney series circuit where the switches and the sockets are diode shorted. He showed us how it worked and drew the circuit on the board. Then he asked what would happen if he replaced the incandescent bulbs with LED bulbs? We all guessed and Bill replaced first one, and then both, incandescents with LEDs. They worked the same.

Then Bill gout out two incandescent bulbs in a parallel circuit with a big double pole double throw knife switch. They both lit when he threw the switch, but when he removed one bulb the other went out. Bill told us the trick...one side of the switch had a 10 microfarad capacitor.

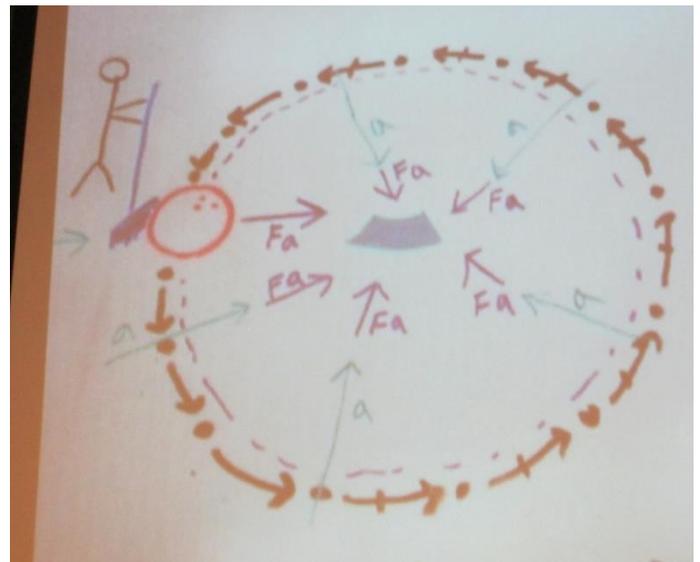
Someone asked what would happen if he replaced a bulb with an LED. Bill tried it and neither bulb lit when he closed the switch. We were all trying to explain this when after about 60 seconds the LED lit!!! We were all mystified. When Bill tried it again, the same thing happened and the incandescent flashed weakly when he opened the circuit. No one had a good explanation and we think it may be due to the complicated circuits inside the LEDs.



Another surprise from phenomenological physics!

...**Karlene Joseph** (Lane Tech) took us out in the corridor and unloaded 10 bowling balls and 5 brooms. She asked us to form groups and accelerate the ball using the broom bristles. Then try making a 90 degree turn. Try moving the ball in a circle.

We all worked about 10 minutes and Karlene called us back to discuss our results. Ideas of inertia and centripetal force were brought up. Karlene has her student groups make white boards and she showed us one illustrating the inward force on the ball going in a circle.



...**Josh Stone** (Marilyn Stone’s grandson) brought his science project and display board. Josh filled a couple clear plastic cups with a layer of water and a layer of oil. He then dropped a couple drops of red food coloring into a cup. The food coloring formed balls and sat on the oil/water line for a while. Then they broke through and retaining their ball shape sank to the bottom of the water. When Josh stirred the mixture the food coloring dispersed in the water but not the oil.

We proposed that the drops had an oil coating when they penetrated the layer and retained that coating until Josh stirred.



...**Pete Insley** took apart a LCD widescreen TV and found three filters covering the liquid crystals. One covering was a simple diffuser but the other two layers were something else. Pete cut up 5cm squares and labeled them number 2 and 3. He passed out two samples of each square to everyone and asked them what optics effects they found the films could produce.

Various teachers found diffraction, double refraction, birefringence, and thin film interference using various filters and combinations. We all decided to take the filters home and look more closely.

...**Andy Morrison** (Joliet Junior College) passed out coat hangers with strings attached so the coat hanger hung from the strings. He suggested we tap the coat hanger against the table holding the strings to our ears to see if we could hear the vibration. Then he took out a small music box and turned the handle and asked if we could hear it. When he placed it against the blackboard and turned the handle it was much louder. He then reattached the back and we could hear it clearly. The boards gave more area to push the air.

Andrew then took out a flute he made out of a piece of PVC pipe about 30cm long. He put a 3cm wooden plug in. Then he cut a 3cm groove in the tube and plug to a 3mm hole in the tube. Adding a 3cm cap that fit snugly over the tube he produced a musical instrument that he managed 3 distinct notes on. Andy said it was more a recorder than a flute.

...**Ann Brandon** (with some help from **Debby Lojchutz**) brought several accelerometer bottles which she demonstrated and then offered to anyone who wanted some.

Finally, **Karlene** passed out small valentine packs. When you “smack the pack” with your fist a heart-shaped balloon inflates “before your eyes.” Thanks for the valentines and a great meeting Karlene and Lane Tech!

Join us next time for more Physics Phun.

Look at ISPP on the web: <http://www.ispp.info/>

Reported by Pete Insley

Directions to Loyola University Chicago

From the North:

From north Sheridan Road: Since there will be no left turns onto W. Sheridan at rush hour, continue to Rosemont Ave. Go east (left) on Rosemont to Sheridan. Go north on Sheridan until you reach the bend on Sheridan. After the bend is a stoplight. Turn right on Campus Drive and continue to the high rise parking structure (P1 on the map).

From the Edens: Exit Edens Expressway at Touhy going east. Take Touhy to Sheridan Road and turn right (south) on Sheridan. Continue to Rosemont Ave. Go east (left) on Rosemont to Sheridan. Go north on Sheridan until you reach the bend on Sheridan. After the bend is a stoplight. Turn right on Campus Drive and continue to the high rise parking structure (P1 on the map).

From downtown or south: Take Lake Shore Drive (LSD) to Hollywood (as far as it goes) and turn right onto Sheridan Road. Continue until you reach the bend in Sheridan. After the bend is a stoplight. Turn right onto Campus Drive and continue to the high rise parking structure (P1 on the map).

Via El trains: Take the Red Line north to the Loyola Stop (near the end of the line, right after Granville). This is marked CTA on the map. Cross Sheridan Road onto the campus (by building 16 on the map). Go straight to Campus Road and look for Cudahy Science (Physics Building), the one with the ~~copper~~ dome on top (Bldg. 19 on the map).

Cudahy Science (Physics Building) is the one with the copper dome on top (Bldg. 19 on the map). We will meet in room 202. Signs will be posted

Campus Map:

<http://www.luc.edu/media/lucedu/pdfs-campusmaps/lsc.pdf>