THE DILATED TIMES

The newsletter of the Drew University Society of Physics Students

October, 1991

CALENDAR OF EVENTS

Wednesday, Oct. 2: Cartoon/Movie- Just what you've been waiting for: Roadrunner cartoons followed by a feature movie (title TBA but I'm sure it will be incredible). Also for your amusement, Steve will provide a mysterious pink substance with amazing properties: Slap it and your hand bounces off, but relax your hand on top of it and it sinks right in.... Come see for yourself.

Monday, Oct. 7: SPS General Meeting- Welcome new and old members. See the faces of your fellow SPSers. Hear what's in the works for this and next semester (e.g. NYC trip in Dec.) Oct. 12 GRE prep/support session. (Is it too late to be an art major?)

Week of Oct. 17: Movie- title TBA, What have you been dying to see? Let us know! Refreshments will be served. (In any coordinate system, that translates to "FOOD!")

Thursday, Oct. 24: Guest Lecture- Dr. Malcuit, from Lehigh University, will speak about nonlinear optics.

Tuesday, Nov. 5: Miniature golf- Consider it the best Phys 3 lab practical you'll ever have. Time: TBA Place: HSC 3rd floor (Clubs and balls will be provided)

Saturday, Nov. 16: N.Y.C. trip- Current plans include a jaunt to the holography museum, shopping in the city (a perfect opportunity to find your under-$5- physics-related grab-bag-exchange gift for the Christmas taco party), topped of by a laser light show at the Hayden Planetarium.

Also keep an eye out for the date of the annual Christmas Taco Party held at Dr. Fenstermacher's house sometime in early December.
And to whom it may concern (somehow "concern" doesn’t seem like a strong enough word...) don’t forget the impending GREs on December 14. I’ll see you there!

NEW OFFICERS

President: Sandy Sweller
Vice President: Steven Gausepohl
Secretary/Treasurer: Leith Dwyer
Activities Director: Bill Kimler

As such, they would love to hear your comments and suggestions regarding activities and CONVENIENT MEETING DAYS AND TIMES.

THE PHYSICS OF JELL-O
by Steven Gausepohl

Many introductory physics labs deal with simple phenomena, such as freefall, simple harmonic motion, Newtonian mechanics, and angular momentum. Advanced Laboratories are much more complex and actually recreate famous physics experiments in the undergraduate lab, such as Michelson-Morley or Frank Hertz experiments. But only the most learned scientists dare to unlock the physical mysteries of Jell-O.

Not many people know this, but Jell-O was actually first discovered by German physicist, Dr. Klaus Von Noall, during a 1943 attempt to find evidence supporting a link between nuclear bonding energies of hydrogen and the zinc code for Des Moines, Iowa. His data was inconclusive, but the high voltages induced by his apparatus created a glutinous material that seemed neither solid nor liquid. Von Noall knew he was on to something big, and after some fourteen years of experimental research, he named his substance the Jacobian-Electrostatic-Legendre-Linkable-Optotransducer... or Jell-O.

The first thing that Klaus noticed was Jell-O’s amazing ability to retain its original shape after deformation. No matter how many times he poked it, stretched it or mashed it, it always came back to that face-centered cubic lattice structure that Jell-O has become known for. The restoration seemed to happen instantaneously (today it is known that the restoration occurs at the speed of light c). This quality came to be the basis to compare the “mushiness” of all other materials... or more scientifically, the coefficient of mushiness. The force required to bounce one kilogram of Jell-O one meter high in one second is defined as one Cosby (F*(kg)/(m*s)) (recently named after the man who has made the most money off the discovery).

Klaus also found that Jell-O, unlike other edible experimental byproducts, acts as a damped harmonic oscillator at small amplitudes. At resonance (approximately 3 Hz) a cubic centimeter of lime Jell-O will wiggle and jiggle for 3-5 seconds dependent upon how cool and fruity the sample is. If the cube is driven by an outside source (ex. a spoon) the equation of motion becomes non-linear and “amplitude jumping” occurs (a messy phenomena, but neat nonetheless).

Finally, Jell-O has been found to have an unusually large index of refraction. This index describes the ratio of the speed of light in a vacuum compared to that in the medium. In a 1956 experiment, a cube of ordinary Jell-O from a Nevada high school was split open, revealing light proven to have originated in February of 1935. Through simple calculations (in natural units), it should be obvious that this yields an index of 1.648+36. Jell-O is currently being used at prestigious institutions as a high power He-Ne filter.
Just as many other discoveries in physics...Jell-O was an accident. But if it were not for the tenacious loyalty of one German physicist to his work, the world might never have known "jigglers."

IF YOU SAY SO...

"It's an infinitesimal lump, but nonetheless..." - Dr. Fenstermacher

"Nothing is really NOTHING!" - Dr. Boeshaar.

"Infinity to the zero [power] is Santa Claus" - Dr. Candiotti

"We saw the answer by inspection, but let's suppose we're stupid" - Dr. Carter

"That answer is possibly right, but it's wrong." - Dr. Candiotti

"Don't be a slave to your notation." - Dr. Carter

YOU HEARD IT HERE FIRST:

"My eyes are bigger than my brain" - Randy Jensen

"My life is a step function _ : _ " - Sandy Sweller

BIRTHDAY FEATURE

NIELS BOHR (Oct. 7, 1885- Nov. 18, 1962)

Niels Bohr was a Danish physicist from an intensely scientific family. His own son, Aage, later won the 1975 Nobel Physics Prize. In 1918 Bohr became the director of the newly created Institute of Theoretical Physics which soon became a very active research center. This was the place that established the "Copenhagen interpretation" of quantum theory.

Bohr contributed to many aspects of physics. But perhaps he is best known for his work in developing a model for the structure of the atom. Rutherford's 1911 planetary model was theoretically unstable because the orbiting electrons ought to radiate energy and consequently spiral inward toward the nucleus. However, Bohr proposed "stationary" orbits for which the electron had definite values of angular momentum (specifically h/2*pi, 2h/2*pi, 3h/2*pi, etc. where h is Planck's constant). This enabled him to calculate energies for possible orbits of the electron. Further, he claimed that when an electron moved from a higher-energy orbit to a lower, it emitted the energy difference, hv (where v is frequency), as radiation. Similarly, absorption of specific radiation, hv, would transfer an electron to a higher-energy state. Bohr received a Nobel Prize for his work along these lines in 1922. He also developed the "correspondence principle" (1916) which says that quantum theory must agree with classical physics at large magnitudes.

Later in his life, Bohr spent much of his time working among scientists for adequate controls on nuclear weapons. In 1955 he organized the firstAtoms for Peace conference in Geneva.

(Taken from the Biographical Encyclopedia of Scientists, Vol. 1, 1981)
PHIRST-YEAR PHYSICS PHILES
---Craig Watson

Are you a bit unsure about what the equation for the Gravitational Potential Energy is? Do you forget the energy involved in Simple Harmonic Oscillation from high school? For that matter, have you not heard of oscillation? Well, you're certainly not alone. In the Phirst-Year Philes column, laymen's terms are the standard. In fact, I may not talk about Physics at all. Well, since I enjoy Physics, you can be sure that some points will be touched, but in a clearly light-hearted manner. After all, I just learned that Einstein's Theory of Relativity has nothing to do with my family heritage (And I thought Einstein knew everything). Anyway, I attended the presentations that Steve, Sandy, and Leith gave reporting on their summer experiences. I had only a slight concept of what they were saying, but I became very interested as I listened. I picked up on a few points, but the most important part is that I began asking questions and they explained their experiences in simple terms (once all of the professors were out of the room). If you get a chance, talk to them about what they did—it is really neat.

I'm still amazed that we covered the first five chapters in our physics book in the time that it took to cover one in high school. Anyone else feel this way? It is a fun challenge, though, if you like the material. As my high school teacher always said, "PHYSICS RULES!!"

By the way, my name is Craig Watson and I am a phreshman. Am I going to be a Physics major? Well, I was thinking along the Chemistry line, but I would not put Physics out of the question. I have an interest in mechanics, especially when it deals with a Yankee pitcher hurling a spherical object with such velocity that the batter cannot complete a full revolution of his Louisville Pine wood and consequently the catcher must absorb the force with an instrument which allows the force to be exerted over a greater distance and time span as to reduce the effect of the immediate change in velocity.

P.S. I bet Einstein couldn't name the starting lineup for the 1961 N.Y. Yankees, but I can!