

The Dilated Times

The newsletter of the Drew University Society of Physics Students

Fall 1996 - Volume 7 Number 1

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Physics Students Intern During Summer

This summer, many of our physics majors worked in the *real world* of research. They participated in internships sponsored by the National Science Foundation (NSF), the National Institutes of Health (NIH), and the Research Experiences for Undergraduates (REU) program. They worked in projects in fields ranging from medicine to high energy physics.

Alice Chu (CLA '98) is a physics major in Drew's seven-year medical program. This summer, she spent thirteen weeks at the NIH in Bethesda, Maryland. She interned at the National Institute of Neurological Disorders and Stroke (NINDS) in the Molecular Neuropharmacology Section.

Her work involved cell culture, binding assays, and saturation isotherms on dopamine receptor subtypes. Her project was "Precious Metal Effects on Dopamine Receptor Binding." Alice said that, "it was fun because I met a lot of interesting people at NIH and I also got to experience research on a serious level." (Apparently Alice hasn't been getting much out of A-lab.) Towards the end of her internship, she gave a poster presentation and talk to other summer students at NIH and her lab section. She will be speaking about her experiences for the Physics Colloquium on October 22.

In his own words, physics major Matthew Diamond (CLA 98) describes his summer internship at the Laboratory of Physical Biology of the NIH.

"It's a freezing -135 degrees C and someone's just sucked all the air out of the room. An electron gun is about to deliver a shot ten thousand times the lethal dose of radiation. Under fire at the underground lab of the Naval Hospital in Bethesda, Maryland were not living organisms or even cells - they were enzymes, the fundamental units of life which catalyze all the reactions in our bodies. Most enzymes did not survive the bombardment, but a few remained intact.

Matt's job was to communicate with the survivors of the attack, which told a lot about enzyme structure and function. He worked for ten weeks with Dr. Ellis Kempler and learned about subjects from the machinery of a linear accelerator to the biochemistry of catalyzed reactions. He described the experience as one he'll always remember. He will give a talk on October 22.

Jonathan Paley (CLA 97) is a double major in physics and computer science. He spent his summer working at the University of Virginia through an REU internship. Jon worked in the High Energy Physics building analyzing data from a Monte Carlo simulation of a future experiment. The experiment will measure certain parameters that help define CP-violation to an unprecedented precision. The data analysis was done in order to optimize the triggering system in the separate apparatus to be used in the experiment.

Jon stated that he "really enjoyed learning more about high energy physics, and [he] loved UVa." You can hear Jon speak

about his experiences on October 15.

Russell Castonguay (CLA 97) and Anthony Rosania (CLA 98) also researched this summer, and will speak about their internships on October 15 and 22, respectively.

Congratulations to all our interns on an exciting and educational experience. See the physics department for more information about summer internships.

Two of the department's brightest students have chosen to spend their senior year intensively studying topics of individual interest. To be invited to initiate honors work, students must meet strict overall and subject-specific grade criteria and be approved by the Honors Committee. Work continues under the advisement of a faculty member, and students perform background research and subsequently design and carry out their own experiments. Jonathan Paley (CLA 97) is working toward honors in physics with advisor Patricia Boeshaar. His work will involve astrophotometry, taking digital pictures of open clusters. (For the astrophysically uninclined, clusters are large but diffuse groups of stars that all formed at the same time.) Jon will also be calibrating the filters used with the telescope. With data reduction and analysis of the pictures, it should be possible for him to determine the ages of the star clusters.

Heather Hughes (CLA 97) is also pursuing honors, but is working in her minor. Her psychology thesis is tentatively titled "Factors Contributing to Successful Learning in Introductory Physics," and focuses on basic mechanics and kinematics. Under the advisement of Edward Domber, Professor of Psychology, she will be identifying student characteristics necessary for conceptual understanding of physics, and will develop a method for the assessment of these student variables.

More Senior Research...

Also working on an independent project in physics is Helen Geib (CLA 97). Helen is studying the effect of the atomic bomb and nuclear energy on the popular perception of physics and physicists during the 1950s. Her sources include non-fiction from the decade, writings on the place of science in society, contemporary magazines such as *Time* and *American Scientist*, and 1950s science fiction films. Helen's advisors are David Baum (physics) and David Kohn (history).

Diamond and Fenstermacher to Attend Sigma Pi Sigma Diamond Jubilee

Matt Diamond, SPS Associate Zone Councilor for Zone 3, and Bob Fenstermacher, president of the National SPS Council, will attend the 75th anniversary celebration of Sigma Pi Sigma in Atlanta in November. The national council meeting of SPS will also be held in conjunction with the anniversary celebration. The featured speaker of the event will be Robert Ballard, the discoverer of the Titanic, and working sessions will focus on the issue of how the physics major can better address the needs of today's students.

Physics Faculty Becomes Networked

The physics faculty joined the rest of the faculty in the Hall of Sciences and those faculty and administrators at the front of the campus in becoming fully computer networked for the first time. Now, in addition to being part of the campus-wide information system, the physics faculty can share programs and data directly, and participate fully in the World Wide Web using the Netscape browser. Laboratory computers will also shortly be included. Unfortunately, students will not share this benefit until the dormitory networking is completed and additional funding is secured.

For the first time since the Hall of Sciences was built in 1968, the physics department will gain some desperately needed space for additional laboratory work. In agreement with all the other science departments and the College, the original shop located on the second floor in the physics department has been moved to available space in the basement. While not as convenient, it was felt that the shop space might be more productively used for a new physics laboratory. The plan will be for the new lab to be used for modern optics and house all of the department's optics equipment including lasers, spectrometers, interferometers, and optical tables. Much of this equipment has been acquired over the last several years and no one location was available for its use. New experiments will be added for the advanced lab and opportunities for independent study will also be available.

Science Rocks!!!

Electricity from "Schoolhouse Rocks"

Music & Lyrics: Bob Dorough

When you're in the dark,
And you want to see,
You need uh...
Electricity, electricity!

Flip that switch,
And what do you get,
You get uh...
Electricity, electricity!

Every room
Can now be lit
With just uh...
Electricity, electricity!

Where do you think
It all comes from
This powerful...
Electricity, electricity!

Through high wires
To here it comes
They're bringing the...
Electricity, electricity!

Every building
Must be wired
To use it uh...
Electricity, electricity!

Power plants
Most all use fire
To make it uh...
Electricity, electricity!

Burnin' fuel
And using steam
They generate...
Electricity, electricity!

Turn that generator
By any means
You're makin' uh...
Electricity, electricity!

A generator is a machine that contains a powerful magnet that creates a magnetic field. When wires are rotated rapidly through this field, then a current of electricity is produced. Now: if we only had a superhero who could stand here and turn the generator real fast, then we wouldn't need to burn so much fuel - heh - to make...electricity!

Benjamin Franklin
Flyin' his kite
Was searchin' for...
Electricity, electricity!

He knew that it had something
To do with lightning
It's all uh...
Electricity, electricity!

Rubbin' a comb
With wool or fur
Will give you a charge of

Static...Electricity,
Electricity, electricity!

Strokin' a cat
To make it purr
You're buildin' up static
Electricity!
Electricity, electricity!

Electricity at rest is called "static electricity," like in the winter, wearing a heavy coat, you get a shock off the doorknob. Or you scrape across a carpet, and sneak up on your very best friend, and zap him on the ear with a shock of...electricity!

Current flowing
To and fro
Makes a circuit of...
Electricity, electricity!

Voltage is the pressure
That makes it go,
It's pushin' the...
Electricity, electricity!

Watts will tell you
Just how much
You'll be using the...
Electricity, electricity!

Powerful stuff
So watch that plug.
It's potent...
Electricity, electricity!

Electricity!
Electricity, electricity!
Electricity, Electricity, electricity!

Thanks to Alumni from Dr. Fenstermacher

This is the second year of the mailing of the Dilated Times to all the physics alums. Several of you have written or e-mailed that you have appreciated receiving news from the department and we hope to continue the practice now at least twice a year. This new improved edition again highlights many of the activities of the department. Enrollments are up (with a record 52 in Physics 11, our introductory course), and our students continue to show ever more diversity in their interests as physics majors. We now have students considering law school, medical school, and engineering as well as traditional careers.

The developments office has notified the physics department that many of you have mentioned us specifically in your annual gifts to the College. We appreciate that very much, and hope that of course you will also remember us when a special piece of surplus equipment from your lab or company becomes available that might be of use to the department. Give me a call!

If you have the interest or inclination we would love to have a contribution from you for future issues of the newsletter. It could highlight career paths as Drew physics alum, items of wisdom for current undergrads, or reminiscences from your physics days at Drew. Send any contribution, or letters to the editor, or just news from your life, to RFENSTER@DREW.EDU, or in care of the physics department at Drew.

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