

The Dilated Times

The newsletter of the Drew University Society of Physics Students

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Editor: Jeannine Dempsey

The Physics-Psychology Connection

As I read the April 9th physics world news recently, I began to wonder: is there some sort of inherent connection between physics and psychology? I bring this up for the physics world news reported that John Hagelin, a string theorist and possible presidential candidate, suggested that we fly 7,000 yoga meditators over Kosovo so that they can spread peace and tranquility through the quantum consciousness field. I know this sounds like a joke, but I assure you that this was from April 9th's physics news, and not April 1st's. Well my issue isn't about how ridiculous the idea is, I'll leave that to the Physics Seminar, but about how physics and psychology seem to be connected at many levels.

The quantum consciousness field, which I had previously read about a couple years earlier in a Psychology Today, seems to be the only real connection between physics and psychology on a "real" level. (Of course there is always the connection through association: Psychology is really just Biology, Biology is just Chemistry, Chemistry is just Physics, and Physics is just Math.) And because the quan-

tum consciousness field is so abstract and unknown, there does not seem to be a real connection between the two.

When people ask me my majors, and I tell them Physics and Psychology, they look at me weird and ask: "Why? There isn't any connection is there?" I say no but I like them both. Then they act like they understand and don't bring it up again. But I'm not the only physics/psychology person. Becca Fraser is a psychology major and a physics minor. Likewise, I know a couple of other people taking upper level psychology courses and they are physics people as well. There is also Dr. Supplee's continued interest in how the subconscious works.

Other very prominent psychologists are/were also very interested in physics. Harry Stack Sullivan, graduated as valedictorian at age 16, and went to Cornell intending to be a physicist. Raymond Cattell graduated from King's College of the University of London at age 19 with highest honors and a degree in physics and chemistry. He later went on and pursued higher degrees in psychology. Hans Eysenck also

attempted to go to school in England for physics, however he took the wrong subjects on his entrance exams and was not eligible to pursue a degree in physics. And unless he wanted to wait another year to take the correct entrance exam, he could choose to start to study psychology. His reply was "What on earth is psychology?". So there have been several well known personality theorists who started out in physics.

So what is the connection? Many physicists don't seem to see one, or don't want to admit it. They look down upon the social sciences, seeing them as inferior, as not being able to truly test things, etc. Yet, I feel that the connection is in what both subjects have to offer. Although neither truly gives a law that will fit for every circumstance, there are statistics that are used to predict the general outcome. However, I think that Erich Fromm, another prominent personality theorist, states it best: "My main interest was clearly mapped out. I wanted to understand the laws that govern the life of the individual man, and the laws of society." This is the heart of it. Physics majors

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want to understand the laws that govern our world and the universe; psychology majors want to understand the laws that govern human and societal behavior. This desire to understand the behavior of either system is what connects physics and psychology (and maybe the quantum consciousness field.)

-David Benjamin (CLA '01)

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Demo Team

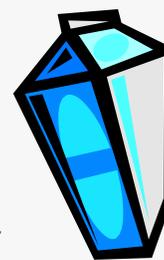
Many people have memories of some wacky person coming in to their primary school classroom and doing all sorts of science demonstrations, often with liquid nitrogen. We here in SPS have decided that we want to be those wacky people that children remember in the future. We have spent the semester working on organizing our Phantastic Physics Phun Demo Team which we will take to local schools and try to make science fun and interesting to students.

This semester we have been practicing our demos and presented them to a group of Drew students and their mentees from Newark who come to campus through the 10,000 mentors program. The Demo Extravaganza seemed to be a hit with the kids, which gives us confidence for going out to the schools next year. The Phantastic Physics Phun team members are Tricia Missall, Nimel Theodore, David Benjamin,

Jodi O'Donnell, Tadahiro Kaburaki, and myself. We have also had the help of Dr. F., Mike Manfredi, and Matt McMahon in getting this team running.

Our demos run from a glowing pickle to exploding milk cartons, and almost everywhere in between. The show ends with chocolate covered bananas and chocolate covered marshmallows dipped in liquid nitrogen for the students. Although due to time constraints we were unable to go out to the schools this year, we have built up the momentum and interest needed so that we can pick up where we left off in the fall and head out to the Madison public schools to share our enthusiasm for science.

- Becca Fraser (CLA '00)



"Flopping" Presentation Doesn't

On May 5, junior Nimel Theodore and sophomore David Benjamin presented the results from their independent study this semester, in a lecture entitled "Flopping in the 21st Century: A Look at Classical and Semi-Classical Theory." Nimel and David spent the semester working with Dr. Jim Supplee on this research, which dealt with atomic dipole oscillations. On the semi-classical side of their research, they started with the optical Bloch equations and used the time dependent form of the Schrodinger equation to obtain a plot for the location of an electron in an atom. The electron starts in the ground state and is excited up to a higher state where it has no dipole moment, at which point a driving force pushes it back down into a lower state. This process is called "flopping". In the classical portion of their research, Nimel and David obtained a numerical solution to Duffing's equation for an anharmonic oscillator; they found that with certain sets of parameters, flopping occurred, but with other parameters flopping did not occur. They were then able to plot a straight-line graph comparing the period of the motion with the amplitude of the forcing function raised to the $-2/3$ power.

This multimedia presentation was very well received by a relatively large audience. The students were very familiar with their research and did an excellent job communicating what they had learned. At the end of the lecture they included several research opportunities for further study, such as why there is a difference between the envelopes of the semi-classical and classical graphs. Any takers?

- Matthew McMahon (CLA '01)

Graduation 1999...Now What?



Bill Hahn

Although I can not provide a specific answer as to my long term endeavors, I do have a few interesting undertakings in the near future. First, I have signed on to work at the New Jersey Governor's School in the Sciences, which is conducted annually at Drew during July and August. I will be acting as an academic tutor and social counselor for ninety of the highest rated high school students in the state of New Jersey. It will be my responsibility to oversee individual labs and projects, while organizing social and athletic events. Because of the unique timing of the Governor's School Program, I will be afforded some free time at the beginning of the summer. I recently had the pleasure of speaking with President Kean at his last open hour, he suggested that I might use this opportunity to donate my time to one of the many non-profit organizations in the Morristown area. I am currently looking into this possibility.

Catherine Schaber

Though nothing will ever compare to my physics education here at Drew, I will go on to Boston College for Graduate school. I will be entering a two year program to earn a Master of Science in Teaching Physics degree. Then my current plan is to remain in New England and begin a career as a high school physics teacher.

After this summer, my future path is unclear. It is not my intention to go to graduate school immediately; however, I have not ruled it out as a possibility later down the road. I have been exploring several different options. I am interested in seeing what the working world is like. I have sent my resume to a wide variety of companies to see what type of response I might receive. This has been useful to see what the job market has to offer someone of my background, and it has afforded me the opportunity to experience a cooperate interview. I am also extremely interested in traveling abroad for a period. Due to my involvement with the Drew Men's Baseball and Basketball Teams, I have not had the opportunity to take a semester abroad or participate in a DIS. Travel abroad would give me the chance of broadening my horizons, while gaining work experience and strengthening my resume.

Martin Zinkevich

I will be going to Carnegie Mellon University to pursue a Ph. D. in Artificial Intelligence on a fellowship from the School of Computer Science and a NSF Graduate Research Fellowship.

I wish that it would be possible for me to be more specific, but at this point I am in the process of gathering more information about these choices. If anyone has any suggestions or would like to speak more, I am more than willing to listen and offer any information that I might be able to provide.

Jeannine Dempsey

Bridget Sullivan

Bridget hopes to put her multidisciplinary talents in physics, math, and computer science to good use at the University of Rhode Island, where she will pursue a PhD graduate program in oceanography. This follows a rewarding internship there last summer.

In order to pursue a career in teaching, I will be attending the University of Massachusetts Amherst in the fall. The program that I am entering is called 180 Days in Springfield which will allow me to obtain a Master of Arts in Education over the course of a year. In the September I will be entering the Springfield school system as a student teacher in the Mathematics department, and will take a couple of courses for my degree after school. In the Spring I will take over three of my mentor teachers classes to complete my clinical teaching requirement. When the program is finished I will be eligible to teach at the middle school and high school level.

Prizes Awarded at Annual SPS/Physics Banquet

A record number of 29 students and faculty turned out for this year's banquet on April 20. Steve Gausepohl (physics alum, 1992) graciously agreed to be this year's speaker. He provided us with an excellent overview of his moving to the academic world (PhD at UVA), to the industrial job world of chip manufacturing. He had numerous good suggestions for physics students, both on careers and power supplies (his humor remains intact!). Thanks again to Steve.

And this year's prizes go to:

Joe Kinast, '01 – Ollom Prize (\$200 for fall books and Feynman Lectures)
Nimel Theodore, '00 – Boxer Prize (\$350 cash prize)
Bridget Sullivan, '99 – Novartis Prize in Physics (\$250 cash prize)

The banquet was the occasion for a record number of 8 students being inducted into the physics honors society,

Sigma Pi Sigma. The total Drew Sigma Pi Sigma inductees now total 52 since it's beginning in 1998. This year's inductees are:

James Davidson (physics)
Rebecca Fraser (psychology)
William Hahn ((physics)
Tadahiro Kaburaki (chemistry)
Daniel Marks (mathematics)
Jodi O'Donnel (chemistry)
Christopher Perry (physics)
Nimel Theodore (physics & chemistry)

And a new tradition has been established whereby all graduating Sigma Pi Sigma members wear a set of distinctive green and beige cords along with their commencement regalia, thus acknowledging their honor.

Congratulations to all our prize winners and Sigma Pi Sigma inductees, and a fond farewell to those seniors heading off for new adventures. The department will miss you!

Summer Internships

Nimel Theodore (CLA '00)

This summer I shall be heading to UNLV (University Nevada, Las Vegas) for a summer Research Experience for Undergraduates. The program is ten weeks long. I hope to be working in the field of Chemical Physics, but I have yet been assigned a project. I am hoping that this experience would expose me to more specialized Physics fields, so that I have a better direction in my applica-

tion to graduate schools. There are many REU's offered all over the nation, and I'd encourage all science students to apply if they have any inclination in pursuing a career in the sciences.

James Davidson (CLA '00)

This summer I will be doing CCD photometry at Eastern Tennessee State University with Dr. Gary Henson. We will be studying Mira stars.

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Address Correction Requested

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