

The Dilated Times

The newsletter of the Drew University Society of Physics Students

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Summer Internship Experience

In the past, there have been many SPS members who have interned in different areas in the scientific field. This year was no exception. In her own words, **Bridget Sullivan** (CLA 99) describes her work in Oceanography:

I spent this summer at the University of Rhode Island's Graduate School of Oceanography as a member of their SURFO (Summer Undergraduate Research Fellowship in Oceanography) Program. I worked with Dr. Issac Ginis and Dr. Clark Rowley of the numerical physical oceanography department on their project to improve hurricane intensity forecast models. Most of my work focused on studying the effects of subsurface structure on hurricane intensity using Dr. Ginis' ocean-atmosphere model. The traditional hurricane model used by the National Hurricane Center only considers atmospheric effects, leaving the ocean surface temperature as constant in time. This does not accurately predict hurricane intensity because the turbulence associated with the storm brings colder water from deeper layers to the surface. This colder surface water acts to slow the storm turbulence effects (a negative feedback loop).

My project examined how the intensity forecasts changed when this feedback loop was taken into account.

In addition to my project with Dr. Ginis, the program involved a bi-weekly seminar series with graduate faculty on their research interests, tours of lab and vessel research spaces, and, most exciting, three research cruises on the Capn Cert

and the CT1 studying pollution flow at the mouth of Narragansett Bay. The program also housed the nine participants in a rental house a mile from campus (an adventure in itself). In all, it was an excellent experience and I would recommend an REU to anyone interested in finding out what scientific research is really like.

SPS National Council Meeting

Catherine Schaber ('99), the Associate Zone Councilor for New Jersey and Pennsylvania (Zone 3), and Bob Fenstermacher, President of the SPS National Council and Drew's SPS Advisor, attended the SPS National Council Meeting at the American Center for Physics near Washington, DC for the weekend of September 17-20. The Council consists of 18 faculty councilors and 18 student associate councilors representing the 18 geographic zones of SPS in the United States. The three day meeting began after a lively welcoming dinner on Thursday evening where members were introduced "Donahue-style" with SPS Director Dwight Neuenschwander asking such questions as "Who's your favorite physicist, and why?". Friday was a day of meetings with SPS national office staff members where SPS business and policy changes were discussed. In the afternoon, breakout sessions tackled issues on benefits for SPS members, ways to encourage more zone-wide meetings for SPS chapters, ways to conduct outreach programs to local schools, and a new student field guide for undergraduate research. After much discussion, the Council agreed to support a new \$3000 prize award for the national outstanding advisor each year. Saturday morning concluded the business portion of the weekend by discussing the outcomes and formulating action plans from the breakout sessions on Friday. For lunch and the rest of Saturday, a bus took our group to the Mall in downtown Washington where everyone was on their own to explore the rich collection of museums and other attractions. Many visited the Air and

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After Graduation

This fall, Matthew Diamond entered a combined MD/Ph.D. program at the Mount Sinai School of Medicine in New York City. This means that, in addition to completing medical school, Matthew will pursue graduate work, probably in biophysics. The National Institutes of Health supports this Medical Scientist Training Program by providing a full tuition scholarship for medical and graduate school, as well as a stipend to cover living expenses for the length of the program--approximately eight years. This governmental agency funds similar programs at medical schools across the country, but very few spots are available, with typically only a handful of positions at each school; this makes these training awards highly competitive.

Mount Sinai was Matthew's first choice: "They have a strong program in the theoretical approaches to biomedical research, with both a biophysics and biomathematics department. And Mount Sinai possesses some of the characteristics which have made being at Drew so enjoyable and productive. . .an intimate atmosphere and strong leadership, both on the departmental and university level. And I am excited to be moving to Manhattan."

Matthew attributes his academic success to the relationships he has formed with members of the Drew faculty: "Real mentoring happens at Drew. I've had the privilege of spending a lot of time with Dr. Fenstermacher in physics and Dr. Udenfriend in the RISE program. And I very much miss the former chair of Jewish studies, Peter Ochs, who taught me *The Meaning of Life*." Matthew also says that learning about Charles Darwin at Drew has been very inspirational.

Matthew recognizes that his summer internships with the New York Service for the Handicapped, the National Institutes of Health, and Weizman Institute in Israel, were very important. These experiences convinced him to combine his interests in physics and medicine. "I remember when I visited Drew as a prospective and Dr. F. and Dr. Supplee pulled me into the physics lab. I look back at coming to Drew as the best decision I think I ever made. And I look forward to treating patients and to the challenge of re-

search."

We recently heard from Matthew, who shared news of his travels through Switzerland, Italy, India, and the Czech Republic. "My summer travels were amazing, but they seem long ago. I flew back from Prague on Friday night and Monday morning found me behind a desk, beginning a three-week biophysics laboratory experience. And then started embryology (covering the whole nine months of development in three weeks). They just introduced us to our cadavers last week as we began a three-month semester of Gross Anatomy. A lot of important information to learn, but I have found here at Sinai an atmosphere where they care a lot about student well-being, stressing the importance of staying healthy and human. I've been taking advantage of living in the City. And when I miss the forest, I walk a block from my apartment and go running in Central Park."

We needn't say more; Matthew sounds content.

Senior physics major Alice Chu spent all of last year at Harvard, although she maintained her official title of Drew University Physics Major. Having been accepted into Drew's seven-year med. program as a high school senior, she completed her undergraduate career in three years, a feat that no one would guess looking at a list of her accomplishments. Among other academic achievements, she has behind her a physics major, a biology minor, the required pre-med. courses, as well as numerous courses in the area of Jewish studies. (She discarded the idea of studying dance after her realization that, although a talented scientist, she is an unfortunate victim of a "total lack of grace", as she puts it.)

Alice recently started medical school at UMDNJ in Newark, NJ. She remained in Cambridge till August, finishing up some research in which she had been involved at Tonegawa Lab. Because the writer of this article is not a biology minor (and is thus incapable of fully comprehending certain terminology), Alice's description of her research will be related verbatim, as shared with us last spring:

"Basically, my job was to clone the promoter of a site-specific gene, which was then inserted into a special plasmid. The plasmid was injected into fertilized mouse eggs which were placed back in the uterus of a female. The resulting mice--called transgenics because of their

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manipulated gene sequence-- are now being mated with reporter mice, and we will hopefully find that their offspring have a site-specific knockout receptor which is relevant in the formation of learning and memory. I'm not doing any of the actual mouse work; what I'm doing to finish up my work is fully characterizing the promoter region and the DNA (i.e., determining exon/intron start sequences, etc.)."

While in Cambridge, Alice was also planning on taking an intensive, full-year Japanese course over the summer. Who knows? Hers may yet be the first genetically-manipulated, Japanese-speaking mice in science.

Although she is not sure which branch of medicine she will venture off into, Alice is fairly certain that she will remain in medicine. She is hesitant to rule out any possibilities, and, taking into consideration her diverse interests, one could easily understand why.



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Space Museum and the Smithsonian, and Catherine found Einstein's statue for a personal pix! The meeting provided plenty of time for council members to share home campus experiences about physics and SPS and the opportunity to bring home many good ideas for implementation here.

Next year's meeting will be held in September 1999. The election for our zone's student associate councilor position occurs in the spring. One or more Drew chapter members should consider running for this office next year and participating in the energizing all-expense-paid weekend meeting. It's a great experience.

-Dr. Robert Fenstermacher

Awards Banquet

At the annual Physics Department/SPS Awards Banquet on April 20, the physics department proudly offered the following endowed awards for 1998:

Matthew McMahon - Ollom Prize (\$200 towards fall semester books, and set of The Feynman Lectures in Physics.) Offered annually to the student from the first year physics course having the most promise as a potential physics major. Honors Prof. John F. Ollom who retired in 1988.

Alice Chu - Boxer Prize (\$350 cash award). Offered annually to a junior or senior showing diligence and distinction in their physics courses. Memorializes Prof. Arnold Boxer, an adjunct physics professor from Bell Labs for over 15 years. Alice will graduate in 1998 and attend UMDNJ medical school in the fall. She is spending her undergraduate senior year at Harvard in a special one year visitation program.

Matthew Diamond - Novartis Science Prize (\$250 cash award) Offered annually to a junior or senior physics major showing high promise for graduate work in science. Offered since 1953 and sponsored by Novartis. Matt will graduate in 1998 and will attend Mount Sinai Medical School next fall in a joint MD/Ph.D. program.

Congratulations to this year's awardees. We wish them well as they progress at Drew and move beyond. This year marks a new first, to our knowledge, for the physics department as we graduate our first two students who are going off to attend medical school.

At the same awards banquet, the honorary society Sigma Pi Sigma inducted four new members for 1998. These included

Catherine Schaber	1999
Kevin Missett	1999
Martin Zinkevich	1999
Prof. Raychel Namiotka	Faculty

This brings to 44 the total number of Drew members of Sigma Pi Sigma since the honorary was installed at Drew in 1988.

Notes from the Outside

As a former co-editor of the *Dilated Times*, I took pity on Zenia's desperate plea for a contribution. My "Notes from the Outside" may come from a bit farther away than some people's, but that shouldn't surprise anyone.

The story of my journey to a completely different field begins in the Spring of 1997, at a time when I felt that my life was getting to be pretty well organized, at least by my standards. Many would argue that things were in complete upheaval, but this is my story, and I say that my life was organized, perfect, even a resume or two. Everything was going really well, even though those weekly problem sets from Dr. Supplee seriously cut into my socializing.

But, as you discovered when you learned about all the factors they left out of those Physics 11 problems that you thought were so poetic, things can only go well for so long, and then you have to add in all the real world stuff and they get messy. (For those who don't already know this, that rule applies to life too.) To make short the long story of my struggles with idealism and education and the realization of all the conflicts between my needs and my aspirations, I changed my mind. In April. On the way home from a job interview. Not the best time to be re-focusing, what with graduation a month away and all, but I've never really been all that logical.

So I revamped my resume, printed out about a zillion copies, and, thanks to the information superhighway, got the addresses of social service agencies in Albany to send it to. Even as I was graduating, I had no idea what my future held except for a three hour drive home. Thankfully, just as the sheer joy of having nothing to do was wearing off, I was offered a job—even after locking my keys in the car at the second interview!! I began work as a Case Coordinator for the Supportive Apartment Program of Rehabilitation Support

Services, a private nonprofit organization based in Albany. This program provides services to adults with severe mental illness living in apartments throughout Albany. (Insert the "I'm also a client" joke here, if you so desire.)

My caseload included individuals diagnosed with, among other things, post-traumatic stress disorder, schizophrenia, major depression, bipolar mood disorder, and schizoaffective disorder. (For the not psychologically-inclined, they're crazy . . .) Some of my clients were extremely needy, requiring a high degree of support, while others required less. Some function well and are nearly ready to transition to less supportive housing, while others function at a very low level and need staff assistance with everything, from motivating themselves to shower to taking a one-day supply of medications without being tempted to overdose.

This all sounds very removed from life on the second floor of the Hall of Sciences, but if you didn't already know, social service agencies are BIG on documentation. I thought that Dr. F. was strict about lab notebooks, but he was nothing compared to the Office of Mental Health. When I was two weeks behind in paperwork and was trying to remember who said what at a treatment meeting, all I could think of was A-lab and trying to write up my lab notes! Needless to say, working with people requires more patience than a Math/Phys problem set and is more emotionally draining than declaring your major, but somehow I enjoy it.

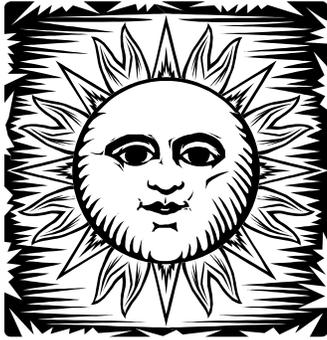
I stopped working full-time in mid-August in anticipation of my return to school, but continue to work as a part-time employee for RSS while I work towards a Master's degree in Counseling at the University of Albany. If all goes well, I will receive my MS in Community Counseling in December, 1999. I took three summer classes and have just started the Fall semester, and must admit that very little of what I learned in Physics is directly applicable to Counseling. I'm certainly not doing problem sets, hooking up lab equip-

ment, or having pizza while watching cheesy sci-fi films. But, on the same level, I sense that other skills have carried over, not the ones required for admission to a physics graduate program or a well-paying job, but those I learned by working with other people, solving problems, and being constantly challenged.

I've only just started my Career Counseling class or I would be better able to elaborate on the topic, but my point remains. I learned things from my brief experience with Physics that I could not have learned elsewhere. Many of you have stayed or will stay in the field, and will probably give little consideration to all the little things you've learned that have nothing to do with the paper-and-pencil, hands-on science of your day to day life but form a great part of who you are. When the pocket protector comes off and the calculator gets put away, we are still people, after all.

I guess that's what the real message of my story is—you really don't know where your life's going to take you, and no matter where that is, physics will not be the only thing to do when you get there. I never in a thousand years would have thought I would be doing this counseling thing and not teaching, yet here I am. It would be awfully convenient if life could be determined by an equation, but the joy of being human is that it can't. Majoring in Physics was one of the hardest things I have done in my life, and, since graduation, I have had a lot of time to reflect on my choices. As difficult as it was for me to survive those four years, I don't regret rising to the challenge. Besides having the cool pin from Sigma Pi Sigma and getting this newsletter sent to me a couple of times a year, I was able to impress a date at Six Flags by giving my interpretation of the "linear induction vehicle" used in the Batman and Robin ride. What more do I need?

-Heather Hughes (CLA '97)



Tycho Returns

Tycho's back in town! What did you do last summer, kids? Well, this particular phantom physicist of the past returned for a brief sojourn back into the afterlife. As there wasn't much to observe on Drew campus (and, as you know, I am confined to poltergeisting only this place for some strange reason), I figured I'd go "home" and check up on some leads.

About ten earth-years ago, Copernicus and Kepler commented on this new arrival. "Quite the physicist," they said. "Changed the world," they said. Personally, however, I'd become quite sick of these fancy-shmancy physicists who changed the world. They always took all the credit away from the Renaissance. And, if the Renaissance is forgotten, I am forgotten. From what I've seen, I already am not quite a household name. "No need for things to get any worse," I always say. Besides, the last revolutionary to come up from Earth was Einstein, Mr. God-Doesn't-Play-Dice-With-The-Universe. Yeah, right. As if this whole Clinton scandal wasn't just Billy the Kid destroying the big guy at a craps game. Sure. (Turning the other cheek and always being fair doesn't get you too far when a renowned cheat is using loaded dice. Ah, well. This too shall pass.)

Well, anyway, I'd heard that this newcomer, Richard (or Dick) Feynman, spent a good deal of his life trying to prove that God does indeed play dice. . .and that He isn't very good at it. This kind of insight did not go unnoticed by the great genius that is me, and I finally decided to meet the man himself.

I'd heard that Feynman could nearly always be found at the Shah's Pleasure Palace, Dancing Room Aleph. I went straight there, er. . .I mean, I had to ask directions as I had never been to that luscious, scrumptious, tasty, um, yes. . .I, uh, walked in. After I, um, scoured those licentious halls for a good four or five days, I found Feynman. He had chosen the guise of his young self, albeit the boisterous white lock of hair he had become known for. This mix posed quite an imposing portrait, especially as he was surrounded by a cherub-scribe and three dancing girls. "Dr. Feynman?" I inquired. He motioned to an empty seat and said, "Have a seat, Tycho. And call me Dick."

I asked him why he had chosen these surroundings. (Decorum really has no point, as all the dead are quite equal.) He responded that he had always done his best thinking in strip clubs. "In fact," he said, "if it weren't for me, they would have closed all the bottomless bars in Pasadena. A good dose of naked girls always gave me the perspective I needed to work on those especially tough quantum-relativity reconciliations. Didn't you ever notice that the Feynman diagram looks almost like the hips of a pin-up girl leaning sideways?" I responded that I had not, and was offended that such trash could possibly inspire a great mind. I told him that I was, in light of this new revelation about him, beginning to doubt his being a genius at all. He just guffawed at me. "You renaissance fogies always were such sticks-in-the-mud. Controlled by the Church! Even Galileo still feels guilty for speaking against the Pope. And you, Mr. Decorum!" He smiled, and waved the giggling girls over. It was at this point that I noticed that all three girls had quite intelligent eyes. The same intelligent eyes. And the same auburn hair. The same lovely face. "My lovely Arlene, have you ever heard the story of how this gentleman, Mr. Tycho Brahe, died? It's one of the best I've heard. And it illustrates perfectly the point I was making about absurdity of pretense. Would you like to tell the story, or shall I?"

Steam came out of my ears.

"I'll take that as a 'You go ahead!' Okay, well, the emperor was having a grand feast and our friend here was invited. He was finally being noticed for his work! It was one of the first times in the Christian era that a scientist was being rewarded and not punished for his revolutionary thinking. There was no way our friend here would screw it up. The day would go perfectly. The great mind of Brahe did not count on the not-so-great body of Tycho. The poor fellow had to pee. For fourteen hours he had to pee. For fourteen hours our esteemed colleague crossed his legs for fear of offending the emperor. In envy, he watched as noble after bishop went to the john. But, no. . .he would prove that physicists have no need of the flesh, that he was not weak. Tycho Brahe would impress the emperor with his bladderial prowess! Isn't that right, Tycho?"

Steam came out of my nose.

"I'll take that as a yes. Well, Tycho succeeded for fourteen hours in holding in his urine, thinking of the wine he had drunk and daydreaming of waterfalls and hurricanes. Finally, the poor fellow's bladder exploded and he died. That, ladies, is how our friend came to this place. Isn't that right, Mr. Brahe?"

I nodded in shame. I wanted to kill him. Realizing the futility of this act, I slumped embarrassedly into my

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chair. But, damn it, for some reason I still liked this guy. And still do. I just can't help it. I suppose I needed someone to open up the can in which that story resided. My old Renaissance buddies had always had too much tact.

We've talked quite a bit since that incident. He's taught me a good deal about the twentieth century. And he's taken great interest in my recent Drew University project. I'm proud to say that I've changed his view of the old guard of physicists with my interest in the living world, just as he's changed my mind about the new guard with his brilliance, friendliness, and rapier wit. I look forward to the next time I talk to him. And the next time I talk to you.

Density and Destiny

Our Ever-Expanding Universe

On April 6th, SPS and the Physics Department co-sponsored a colloquium at which Dr. Carter spoke on the topic "Density and Destiny: Our Ever-Expanding Universe". Cosmologists have been trying to decide if our universe will continue expanding forever, or if the firmament will eventually end in a big crunch. Recent observations of distant supernovae favor perpetual expansion and indicate that the expansion is actually speeding up. This implies the existence of an anti-gravity force, as was envisaged by Einstein when he postulated a so-called cosmological constant. (He later discarded it, describing it as "the greatest blunder of his career". Now he must be laughing in his grave.) Theorists are trying to understand what this strange force might be.

Dr. Carter showed how the big bang theory can be derived from Newtonian mechanics, how inflation modifies the theory's conclusions, and how the inclusion of the anti-gravity force leads to a model of the Universe that agrees with the recent findings. He also spoke of the excitement of scientists about the planned launching of two sky-mapping satellites, which some think may revolutionize our understanding of the cosmos. Lastly, Dr. Carter challenged physics students to "seize the opportunity" to get involved, noting that "The Truth is Out There".

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