# The Dilated Times

The newsletter of the Drew University Society of Physics Students

**Spring 2003 Volume 13 Number 2**

Editors: Arlene Ovalle and Adam Friedman


## SPS Goes to APS in Philadelphia

On Saturday April 5th, a group of students and faculty represented Drew University at the April Meeting of the American Physical Society held in Philadelphia, Pennsylvania. Dr. Fenstermacher, Tom Zielinski, Karen Mooney and Arlene Ovalle all woke up early Saturday morning to attend the meeting. The group met up with Dr. Carter and Dr. McGee at the Loews Philadelphia Hotel. All of us served as a cheering section for Tom who presented his work on the measurement of the electro-optic coefficient of poled polymer films in the SPS Research Session. The session was presided over by Dr. Gary White, Director of the Society of Physics Students and Sigma Pi Sigma.

The atmosphere of such a big physics meeting was exciting. Everywhere we looked we saw physicists whom we recognized because of their great talents. In one of the hallways we saw Brian Greene, the string theorist from Columbia University. We all pointed and felt as if we had just seen a celebrity. Tom, Karen and Arlene attended his talk on the promise of string cosmology where we proceeded to sit in the front row, an arms length away from him.

Another highlight of the trip was the great opportunity to hear John Wheeler speak. At the meeting Wheeler was awarded the Einstein Prize for pioneering investigations in general relativity and for leadership and inspiration to generations of researchers in general relativity. In his talk he asked: "Is all this great world that we see around us a work of imagination?" It seems that after more than half a century in physics one starts asking such questions.

Different members of the group attended talks about Using History in Physics Education and Physics Demonstrations in the 21st Century. We saw some of the basic demos such as pulling a cloth out from under a table setting and some really tricky ones where we were asked to guess what would happen (great questions to fool your other physics friends).

The group also enjoyed a bit of Philadelphia thanks to the beautiful views of the hotel and all of our meal outings. On Saturday evening the entire group enjoyed a great meal at a wonderful Italian restaurant, lobster ravioli was the preferred dish with a ratio of 4:7 and Tiramisu was the favorite dessert 5:7. We all discussed the events of the day and looked forward to our next day at the APS meeting and our beds that were waiting for us at the hotel. That night the students watched *Indiana Jones* where we pointed out everything that was wrong with the movie, except for Karen who knew all of the little boys' lines. On Sunday, Dr. F and the students enjoyed a meal at the Philadelphia Hard Rock Café where we discussed the cool physics demos we had seen, the tricky

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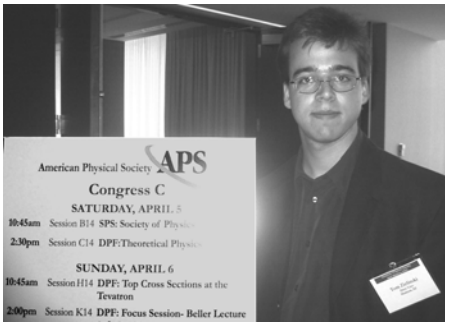
**Check out the Physics Department Web Page at**
**http://www.depts.drew.edu/phys/**

## Tom Zielinski Wins Goldwater Scholarship




Tom at APS Meeting

Junior Tom Zielinski has been awarded a 2003-2004 scholarship by the Goldwater Scholarship and Excellence in Education Foundation. The 300 Goldwater scholarship winners were selected on the basis of academic merit from a field of 1,093 students who were nominated by college faculties throughout the nation. The one year scholarship will cover the cost of tuition, fees, books, and room and board up to a maximum of $7,500 per year.

Tom is a major in physics and computer science and for his application chose to write about his summer research here at Drew last summer. The work was part of the Drew Summer Science Institute and an NSF RUI Grant obtained by Dr. David McGee. Tom worked with Dr. McGee to characterize the electro-optic effect in thin polymer films. Such films may find applications in modulating laser light for communications.

The Goldwater Foundation is a federally endowed agency established by Public Law 99-661 on November 14, 1986. The Scholarship Program honoring Senator

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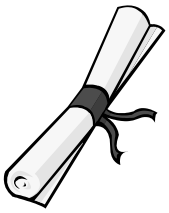
# Four Years of Physics, Five More to Go…

As a freshman, I wanted to be a physics major. I knew little of physics – only the basic Newtonian formulas that had been driven into my head my senior year of high school (you think I would have done better in my intro classes). However, something about the field sparked my interest. I don't purport to be the best physics student in the world (heck, not even in this school), but I have persevered – yes, persevered is the right word. Physics is not easy, at least compared with every other subject I've had thus far. It (a physics major) has required dedication, intensity, and sometimes sacrifice.



I have, however, reaped some rewards from the hard work and forfeits made. One event that sticks out in my mind occurred in first semester physics. It was an exam question which asked the orbital velocity of a satellite 100 km above the surface of Mars (sorry for giving away one of your questions Dr. Supplee). I hadn't seen a question of that nature before. I was able, with a little diddling, to figure out the right answer. The unique sense of satisfaction that I derive from finding the solution to something I have never before encountered, using only the language of mathematics, has been a source of continuous enjoyment.

I have also come to respect, even revere, the process of scientific discovery. Compared to the pseudo-science claims with which our society is continuously bombarded, false claims of miracles, and even religion, science seems to be the only pure, natural system. As Sagan writes, "Scientists should not seek to impose their needs and wants on Nature, but instead humbly interrogate Nature and take seriously what they find." I don't need or desire to dive into this right now – since you are reading this, you are probably a person interested in physics, or science in general, and understand what I'm getting at.

I previously stated that there are rewards associated with success in physics that aren't seen elsewhere. These rewards aren't limited to intangibles. As I am preparing to end my tenure at Drew, I have noted a peculiar trend among my non-physics peers. Many don't have a plan after graduation, and have few prospects for a job or financial security. I, as well as the other physics majors, have definite plans. I'll be going to the University of Maryland- Baltimore County to study optics/photonics. Of the non-physics majors I know who *are* going to graduate school, many are footing the bill themselves. I'll just say that UMBC is going to take care of me very well – all of the nights spent in the RISE reading room working on problem sets were well worth it.

I'm extremely happy that I chose physics as my major. I also feel lucky to have been given the chance to attend a school with a great department (special thanks to my parents and the professors). I hope that more students will see the opportunities offered in the field of physics. Being a physics student is hard at times (especially in Thermo), but it is well worth it.

—Colin V. McLaughlin, '03

# Goldwater

*(Continued from page 1)*

Barry M. Goldwater was designed to foster and encourage outstanding students to pursue careers in the fields of mathematics, the natural sciences, and engineering. The Goldwater Scholarship is the premier undergraduate award of its type in these fields.

Drew is able to nominate up to four students per year for the scholarship, two sophomores and two juniors. Physics was well represented this year with the sophomore nominees being Christina Aragona and Katie Rolfe. Our congratulations to them as well for being nominated by Drew and participating in the lengthy application process. The fourth Drew nominee, junior Holly Kuzmiak, also won a scholarship. Holly is a biochemistry major. All in all, it was a very good Goldwater year for Drew!

—Dr. Bob Fenstermacher

# Summer Plans: Not Just Fun in the Sun

**Tom Zielinski** will be spending this coming summer at Penn State in a ten week REU program. He will be working with Dr. Moses Chan on a condensed matter project. Possibilities include research on the transport, magnetisation and thermodynamic properties of one-dimensional metallic superconducting wires of nanometer diameter, the Casimir Effect, or the superfluidity of atomically thin He-3-He-4 films in the limit of absolute zero.

This summer **Karen Mooney** will be participating in an REU at the College of William and Mary in Williamsburg, VA. She will be participating in an experimental project, either optical or atomic in nature. The program runs from May 27 to Aug 1, and also includes talks, tours, joint activities with the program at Hampton University.

**Christina Aragona** and **Katy Rolfe** are planning to work in Dr. McGee's laser lab at Drew as part of the Drew Summer Science Institute. They will spend eight weeks exploring some of the properties of photorefractive materials (materials which experience a change in their index of refraction when exposed light).

**Emily Hamilton** will be working at the Princeton Plasma Physics Lab continuing a biophysics project that she started in January. She is going to be building equipment to measure the relation between ion flow across physical plasma membranes to the flow across biological cell membranes.

# A Breed Apart

Do you ever feel misunderstood or unappreciated? I don't mean when you try unsuccessfully to borrow the family car for a Saturday night date. I mean when you've just learned that the Clebsch-Gordan coefficients are merely an application of group theory, and there's no use in sharing your excitement with your roommate, who is a history major.

When I go home at night, my wife asks, "What did you do all day?"

I decide to tell the truth. "I tried to find a low-amplitude solution of the Korteweg-deVries equation."

She quickly changes the subject. "Who did you have lunch with?" (Ungrammatical but comprehensible.)

I remember, too vividly, an incident that occurred when I was doing research at Bell Laboratories in underwater acoustics. I was the senior scientist aboard a Navy cable-laying ship, measuring with an array of hydrophones the signals transmitted by a fleet tug towing a sound source. It was March, and we had been at sea in the North Atlantic for three weeks. The planned exercise was nearly over but I asked the captain if we could add one more ten-hour run. He very reluctantly agreed but warned me that bad weather was approaching and that he wanted to pull in the hydrophones and get underway for home as soon as possible. I had calculated that at a range of 105 nautical miles the received sound signals should come booming in because of a focusing effect. I had even determined the sound levels to be expected – no small task because getting solutions of the wave equation in the vicinity of foci and caustics is tricky business.

At exactly the predicted distance the loudspeaker in the test room overloaded, I switched in 20 dB of attenuation, and recorded a sound level very close to what I had calculated. I ran up to the bridge and excitedly told the captain what a great discovery we had made. I will never forget his response. He said, "Somehow I feel strangely unmoved." Turning away from me, he barked into the intercom, "Bring in the cable; we're heading for the barn."

So my momentary elation was squelched – but understandably, by someone whose responsibilities were different from mine. My real satisfaction came later, as the importance of so-called convergence zones in underwater signal detection became generally appreciated by acousticians.

There is a lesson in this. As a physicist you will know things and do things that you can't tell your neighbor, because the neighbor can't comprehend them. But being a member of the world-wide community of scientists who can isn't half bad.

Arlene and Karen enjoy their Gyros in Philadelphia, yum, yum!

*(Continued from page 1)*
questions of the Physics IQ session, and the pros and cons of having demos in class among other things.

The trip was very beneficial for everyone. Students had the opportunity to see a big physics meeting where it seemed that all of the top physicists had come together. And our professors were able to meet with colleagues from around the country to discuss the best methods of teaching physics.

The weekend was especially beneficial for those of us who were able to obtain official APS mints and badges that blink and say "Physics Turns Me On".

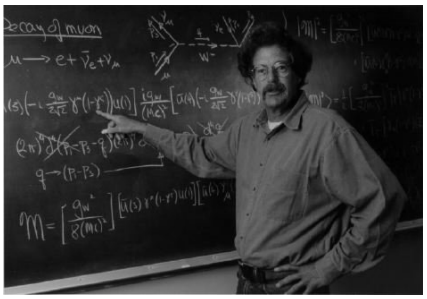
—Arlene Ovalle, '04

# Career Corner

It has been hard not to notice the sagging U. S. economy over the past year: the stock market is down considerably, companies are laying off workers, and college graduates are reporting it difficult to find jobs. In difficult times like these, the problem-solving and communication skills that come with being a physicist are more valuable than ever. Indeed, consider some of the results of a recent study published in the April/May 2003 edition of the *Industrial Physicist*. Perhaps the most interesting result was that the median salary of Ph.D. physicists in the private sector increased 11% between 2000 and 2002, the same period over which the economy began its downward slide. Looking at salaries, the numbers are impressive: the median salary for a physics Ph.D. aged 35-44 working in the US was $95,000, while Ph. D.'s working in the Middle Atlantic and New England states reported salaries from $86,000 up to $124,000. The story is also quite good for other physicists. The median salary for the 35-44 age group was $87,000 and $78,000, for master's and bachelor's level, respectively. "That's great if you have a job", you might say, "but what's the unemployment situation like for physicists?" Again, the numbers are quite good: The unemployment rate for Ph.D. physicists was 1.2% in 2002, a good bit lower than the 5+ % often seen in the general employment sector. But the best part of all is that 90% of the employed physicists reported that they were working in science and/or engineering. All of this isn't surprising- our technological society needs people who can think critically and communicate their ideas. While much of the report focuses on physicists with graduate training, it is still clear that studying "the liberal art for the 21st century" will maintain physics as an excellent launching point for a multitude of careers.

—Dr. David McGee

# Notes From the Outside Special: Meet David J. Griffiths




Recently, I was given the opportunity, nay, honor, to interview physics textbook author and Reed College Physicist David J. Griffiths. For you upperclassmen, I know that sounds exciting, and all of you probably envy me! And, for those of you poor deprived, ignorant underclassmen, allow me to enlighten you as to why you should be excited: David J. Griffiths is the author of two texts that we use at Drew, Introduction to Electrodynamics and Introduction to Quantum Mechanics. Ask anyone who has taken these classes here at Drew, and I am sure they will tell you hands down that these are the best texts that they have used out of all their physics classes. In fact, Druids have liked them so much that there is even a poster proclaiming such in the H-Bar and Grill (go see for yourself), and I understand that Colin (or was it Tom?) has erected or is in the process of erecting quite a shrine to the literary stylings of Prof. Griffiths. Anyway, a few years back, in a strange mix up (ask Dr. F.) regarding the existence of two David Griffiths' (Griffiths's? Griffithses? Griffithsi?), who are both physicists in Oregon, somehow this David J. Griffiths made a visit here to fair Drew U. I, upon hearing this news, decided to try to interview Prof. Griffiths to see what he thought about Drew, its physics department, his textbooks, and physics in general. And, here is what happened….enjoy!.

Q: At Drew we use both your electrodynamics textbook and quantum mechanics textbook, and by far, you are our favorite physics textbook writer. A good textbook is often hard to find, and your textbooks are both superb.
A: Thanks.

Q: Some, as strange as it may sound, have gone as far as to talk about constructing mini-shrines in your honor and post worshipful signs in our physics lounge.
A: Good idea!

Q: So, in short, you are regarded at our university as physics textbook writing god. We especially appreciate your many extremely lucid, colorful linguistic descriptions of various physical phenomena. Where do you get your ideas, or perhaps your inspiration?
A: Well, I think metaphor and analogy are very useful devices for explaining difficult concepts. In my lectures I am always hunting for just the right way to illuminate the point, and when these arguments work, they find their way into my books. Also, I am very conscious of the fact that I am telling a story---I want it to be coherent, accessible, and entertaining---why not?

Q: Which book did you enjoy writing more, and why?
A: Hmmm. Hard to say. I take more satisfaction from the E&M book, I suppose, because---having gone through three editions---it is much more polished. On the other hand, the ideas in Quantum are more bizarre and fascinating. As for the act of writing, both books developed out of courses I had taught many times, so in neither case did I ever sit down with a blank piece of paper to "write a book". Both of them evolved slowly, over a long period, and both of them, I think, reflect the fact that they started out as lectures.

Q: Many have noticed that your quantum mechanics textbook has never gone out of a first printing.
A: Not so. I think you mean first EDITION.

Q: Some say when you wrote it you were in some type of textbook writing zone, and subsequent editions will never be needed. Was it a textbook writing zone?
A: No. I think there are many flaws in the Quantum book (especially the third chapter, in which I undertook to answer every question I had as a student about linear algebra---this was a big mistake, and many people get bogged down in a lot of detail that turns out not to be necessary). At any rate, I am working on a second edition, which I hope will be available by the end of the year.

Q: The cat illustration on the front cover of the quantum mechanics book has elicited comparisons of the text cover to that of a high school year book. A philosophy major friend of mine thought it was an illustration of Schrodinger's cat, and that the cat on the back cover was actually dead, and not being playful, as some others thought. Is he right? And, also, it would be of interest to us, for some unexplained reason, to know what type of cat that actually is. I have heard the debate run from tiger to tabby to ocelot.
A: Of course, it is Schrodinger's cat, and it's supposed to be alive on the front and dead on the back. (I have had several people complain very seriously that the latter is in gross bad taste. OK, then he's just snoozing.) Actually, the picture itself is shamelessly plagiarized from a cover of Scientific American. I was horrified when it came out---I had nothing to do with it (apart from approving the idea of a cat on the front, and suggesting they put a dead one on the back).

Q: Are you in the process of writing any other books…we are especially in need of a good optics text?
A: Nope.

Q: What are your favorite physics books?
A: Purcell's "Electricity and Magnetism" is, in my opinion, the greatest. And I love the Feynman "Lectures on Physics", of course (though I would hate to have tried to LEARN the subject from them).

Q: What is your favorite physics subject to teach and or write about and why?
A: I don't know. Quantum Mechanics (because it is so astonishing), Electrodynamics (because it is so perfect), General Relativity (because it is so beautiful), Elementary Particles (because it is so fundamental), Statistical Mechanics (because I really don't understand it).

Q: Who is your favorite physicist and why?
A: Difficult question. As human beings, [some] physicists are not a particularly admirable lot. Newton (but you have to take away all the nutty religious stuff from his later years). Einstein, of course (but he was a pig toward women). Faraday made the discoveries I most envy. Maxwell for his influence on theoretical physics (though in a deep physical sense I don't think he really understood electrodynamics). Not Bohr (a wonderful man, but way over-rated as a physicist, in my opinion). Feynman? Sure, though he was unbelievably childish at times. How about Fermi? Yes: I think I'll go with Fermi.

Q: What interests you besides physics?
A: History, politics (though I think we have the most dangerous and destructive President in over 100 years, and it is going to take a long, long time to undo the damage he has already caused).

Q: It has just recently surfaced that you actually paid a visit to Drew University a while back as some sort of inspector. Tell me what you thought of Drew and its physics department.
A: Great college, and a great department. I remember Jim and Ash and Bob particularly fondly. Above all I was impressed by the easy rapport between students and faculty.

Q: Did you get a chance to have a bite to eat in the commons (our dining hall)? If so, did you think the food was as awful as we all think it is?
A: Yes. No. (Why are all students everywhere so fussy about food? Reed has really excellent food---much better than anything I had as an undergraduate---but STILL they complain. You've got more important things to think about!)

Q: Would you ever consider visiting Drew again, perhaps to give a lecture or just visit? If no, what if I offered you a free meal in the commons?
A: Sure. Well, in that case maybe not.

Q: What, if any, advice would you give to a physics major?
A: Take pride in your work. Do not allow the nasty, competitive, and sometimes downright cruel culture of our discipline to get you down---and above all do not practice such behavior yourself.

Q: Just a wild question…if you could be any animal, what animal would you be and why?…and don't say ocelot.
A: OK, I'll say cat, then. They think for themselves (unlike dogs), and above all they have a wonderful natural sense of grace.

# Wait, it's over? Now?

Speaking from the final month of my senior year at Drew, I can honestly say that my time here has behaved like most other long-term projects in my life. I don't fully appreciate how much I am going to miss them until they are [almost] gone.

In the fall of 1999 I came to Drew intending on majoring in physics. That turned into a double major in physics and computer science with a minor in math pretty quickly. Then I decided to spend a year studying in Ireland. Then I decided to write an honors thesis. Despite the increased complexity that came along with the additions to my original plan I am now preparing to graduate. I owe much thanks to both departments for making this possible as I have not been a traditional student by almost any definition, and I have probably required a little more paperwork than most students. I have enjoyed the experience of being a member of both departments very much and I am very glad to have Tom Zielinski one year behind me on the same path.

The study of physics has had an impact on every facet of my life, and I feel that there is no other major that better prepares students for life after Drew. Drew was not my first college, nor my first physics department, and I am proud to say that Drew is the one that made the difference in my life. Starting with the first time I met with Dr. F and Dr. Supplee (my advisor), I had high expectations for the small, close-knit, and personal physics department. After spending several afternoons at Dr. F's house, speaking with most department members at home (normally at night and/or on the weekends), several road trips as far afield as Baltimore, and one diner in NYC and play at Lincoln Center later, I am more than happy to report that my expectations were exceeded. Dr. F. and the entire department don't leave the student/faculty relationship in the classroom. In fact, the department is like a very interesting extended family, each member with their own quirks, specialties, and positions that become very well known to all others.

And now the "where am I going after Drew" statement. I have several job applications out and have been on one interview so far. I am also in the (very long) process of applying to computer science programs in Ireland and Australia. I look forward to receiving future editions of the Dilated Times and looking back to Drew with a smile.

—Brett Becker, '03

## Physics Quotations:

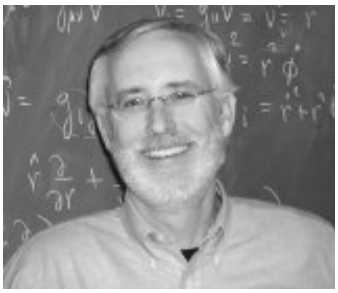
"In Hilbert space no one can hear you scream!" –Dr. Carter, Quantum

"Does he have an off button?!"
–Chris Vare, Thermodynamics Class

Chris Vare: "Maxwell...he's good to the last drop." Adam: "No, that's Maxwell *House*..." –Thermodynamics Class

"Was Quantum Mechanics invented yet when you were in college, Dr. F.?"
—Adam, Seminar

# Where was Dr. Supplee?



This past fall semester, Professor Jim Supplee took a sabbatical to Stevens Institute of Technology in Hoboken, NJ. Now that he is back, the Dilated Times caught up with Dr. Supplee to find out what he did while he was away. Professor Supplee studied coherent effects in semiclassical optics. In his own words this means, "Studying how an atom responds to laser light under certain conditions, often when atomic decay and collisions are small effects.

Dr. Supplee's work at Stevens concentrated on Ramsey Fringes. "This involves hitting an atom with (perhaps) two light pulses. The first light pulse starts a dipole oscillation in the atom. The second pulse may make the dipole oscillate more *or* less– depending on the phase relation between the already oscillating dipole and the second pulse." The atomic response is extremely dependent on the time delay between the pulses, so this technique allows for very sensitive measurements. The original work earned Ramsey a Nobel prize in 1989.

Dr. Supplee plans on continuing his work, and presenting his paper at the APS Division of Atomic, Molecular, and Optical Physics meeting. The meeting will be held at the University of Colorado campus in Boulder, Colorado from May 21- 24, 2003.

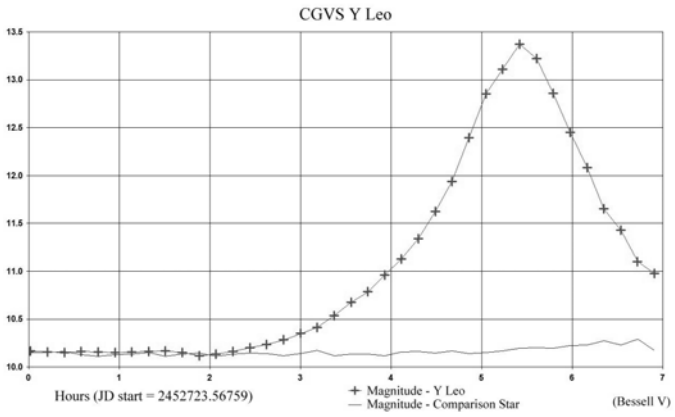
While continuing his work at Stevens this spring, Professor Supplee is also teaching a graduate course in Quantum Optics. Supplee says that teaching the course is a lot of work, but well worth it. "In research, many of us study rather narrow topics. In contrast, this course (although specialized) allows me to review a wider range of the fundamental physics underpinning important effects in semiclassical optics." According to Supplee quantum and semiclassical optics is a very hot field right now, with discoveries like slow-light, atom-optics, and electromagnetically induced transparency. As exciting as it is for Drew to have professors like Supplee working on the cutting edge of physics, we are all very glad to have him back this spring.

—Karen Mooney, '04

# Brett's Observatory Fun Zone

This semester I am working on an independent study in the observatory. Part of my study has been the installation and initial testing of our new hardware. The department has recently purchased a SBIG ST-1001E CCD camera and an eight position filter wheel for 50 mm filters. The camera and filter wheel are attached to a custom mount that was made specifically for the Drew telescope and camera by the telescope manufacturer, DFM Engineering. The mount features a sliding dovetail assembly that allows the eyepiece and camera to be easily moved in and out of the focal point of the telescope. Previous designs required removal of (and therefore refocusing of) the cam era whenever the eyepiece was used. The department also recently acquired a UBVRI Bessell filter set for photometry and a three piece neutral density filter set for lunar and planetary imaging. We also plan on purchasing an LPR (Light Pollution Reducing) filter soon. The telescope control software has been upgraded and matched with new CCD control software.

With the new equipment installed and operational I set out to obtain the light curves of some short period variable stars and eclipsing binaries. A few weeks ago I observed almost all of the six hour eclipse of the Y Leonis binary system, going from a magnitude 10.0 to 13.2 in only three hours followed by a corresponding three hour climb back up to 10.0. The eclipse occurs every 40 hours, but only occurs every five days or so during dark hours on earth.




Light curve

Weather permitting (ha ha) I hope to get a more complete and detailed observation of the eclipse again before the end of the semester. I am also taking pictures of the Cepheid variable RU Camelopardalis every clear night. Hopefully this will result in a light curve showing the 22 day period ranging in magnitude from 8.1 to 9.8. Time and weather permitting I would also like to obtain the curve of a minor planet.

Be sure to check out the astronomy webpage at the end of the semester. In addition to some of my results, there will be a collection of pictures taken with the new camera including the Orion Nebula, Andromeda and Whirlpool Galaxies, the Pleiades, Jupiter, Saturn, some asteroids, and the Moon.

The address is: http://depts.drew.edu/phys/Astronomy/astronomy.html

—Brett Becker, '03

## Physics Quotations:

"Rockets Get Complicated."
–Colin, Quantum Mechanics Class

"Sine is odd; not strange, but odd."
–Dr. Carter, Quantum Mechanics Class

# Drew SPS attends Brian Greene Talk

On March 5, 2003 a group of Drew SPS members got to hear the legendary Dr. Brian Greene lecture on Superstring Theory. Dr. Bob Fenstermacher, Dr. Ash Carter, seniors Alex Waegel and Colin McLaughlin, and juniors Karen Mooney and Tom Zielinski drove up to Montclair University for the talk. Greene, who currently teaches at Columbia University and Cornell University, received his doctorate from Oxford and has published several papers in String Theory and Quantum Gravity.

Greene has also written *The Elegant Universe*, a best-selling novel makes the concepts of a Unified Theory accessible to the public. The lecture we attended mainly concentrated on the discrepancies between General Relativity and Quantum Mechanics, or as Greene explained to the audience, "the very big and the very small." Greene used simple metaphors and great graphics to relate the subjects to the general public. It was easy to see why Brian Greene is so popular with scientist and non-scientists alike.

—Karen Mooney, '04

## Congrats to the 2003-2004 SPS Officers

**President:** Tom Zielinski
**Vice President:** Arlene Ovalle
**Activities Chair:** Karen Mooney
**Newsletter Editors:** Adam Friedman, Christina Aragona, and Emily Hamilton

## Advice to Underclassmen from Senior Alex Waegel

I think that the most important advice that I could pass on to the younger generations of physics students at Drew is that they shouldn't feel as though they *have* to go on to become a researcher some place and work in a lab for the rest of their lives. While there is certainly nothing wrong with that particular choice in lifestyle, physics majors do have other avenues that are available to them. I personally chose not to go the route of the classical physics researcher, and am instead pursuing a more interdisciplinary graduate education. A physics major at Drew does more than just prepare you for the field of physics, it opens up the abilities of logical thinking, skepticism, and problem solving which are useful in any field.

In regards to my plans for next year, I am still waiting to hear back from several graduate programs (Carnegie-Mellon, Lehigh, and Penn State) but I have already been accepted into the University of Delaware's program in Energy and Environmental Policy. So although I am not entirely sure which school I am going to end up at next year, I will definitely be in a graduate program dealing with energy and environmental policy.

—Alex Waegel, '03

## Physics Quotations:

"...the miserable constant..." —Dr. Carter, Thermodynamics Class

"Someday I hope someone names an equation after me, and they call it the Rodrigues Equation."
—Adam, Mechanics Class

"You know, cludgey, the opposite of crisp." —Dr. Supplee, Mechanics Class

"That [function] converges like gangbusters!" —Dr. Supplee, Mechanics Class

Dr Boeshaar: "Now you should be able to solve these problems in about five minutes each."
Colin: "Yeah... IF YOU'RE BATMAN!!!"

"The bird of fun has flown from the cage, and when that happens it's pretty hard to put it back." —Guy from seminar video

**Send us your favorite physics quotations**
**Afriedma@drew.edu Aovalle@drew.edu**

## Record Sigma Pi Sigma Induction!

On Tuesday, April 22 the Drew Chapter of the national physics honor society, Sigma Pi Sigma, will induct eleven new members, a record number for our chapter. This will bring our total number of members up to 77 since the installation of our chapter in 1988. We are especially pleased this year to be inducting RISE member, Dr. James McKenna, an applied mathematician and formerly an Executive Director at Bellcore. He has been a member of RISE since 1997 and has worked with several physics students on independent projects.

Congratulations to all the new inductees:

Michael Albert Adams
Brett Arthur Becker
Adam Louis Friedman
Emily Timmons Hamilton
Eric Andrew Kaeuper
James McKenna
Colin Vincent McLaughlin
Karen Emily Mooney
Arlene Ovalle
Christopher Everett Slagle
Thomas Paul Zielinski

## Upcoming SPS Events

**Saturday, April 12**
**Spring Saturday**

The Physics department welcomes prospective physics students to its fabulous demo session

**Tuesday, April 22**
**SPS Awards Banquet**

Sigma Pi Sigma Induction Ceremony
Endowed Prizes
Celebrate the Year

**Monday, May 5**
**SPS/Physics Annual Spring Picnic**

Dr. F's House
Time: 4 PM

## Alumni Business Card Update

Many thanks to those of you who have assisted us with our business card requests. Your contributions help to inform present and prospective students of the sweeping occupational range of Drew physics graduates. Just write your year of graduation on the back of your card and mail it to Bob Fenstermacher here in the department. We will then add yours to our display of cards for all to see in the hallway. By allowing current students to see what you are doing, you will be both promoting our cause and creating possibilities for informational contacts with these students. If you don't have a card because you ran out of them, can't find them, you are still a student, etc… MAKE ONE! The column to the right lists all who have contributed so far. If your name is not on this list , you owe us a card!

- The 2002-2003 SPS Officers

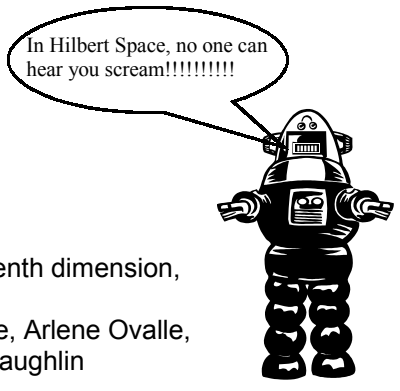
Steve Apotheker
Larry P. Barisciano, Jr.
Mike Berry
Wayne R. Chase
Robert M. Eichhorn
Bob Fenstermacher
Steven Gausepohl
Helen K. Geib
J. Storrs Hall
Michael B. Headley
Rassmidara Hoonsawat
Heather Hughes
Michael L. Kelly
Chris A. Kendziora
Harry M. Kriz
Amy Perkins
Christopher C. Perry
Bill Pezzuti
Michael Richichi
Brad Schoening
Hugh C. Staley
Nimel Theodore
Ron Kevitz
Geoff Haigh
Phil Mauger
Andren Applequest
A. Christianne Ridge
Richard Riesz
Tricia Missall
Mark Soler
Jon Spanier
Jay Titman
Rick Fuest
Len Feldman
Chris Bretschnieder
Heather Beirne
Matt McMahon

Thanks Again!

# The Dilated Times

**Drew University**
**Department of Physics**
**Madison NJ**
**07940**

***Address Correction Requested***




**Inside…** Interview with David J. Griffiths, Dr. Jim Supplee is back from the tenth dimension, Goldwater, Physicists are the best, and more!!
**Contributors:** Dr. Bob Fenstermacher, Dr. Ashley Carter, Dr. David McGee, Arlene Ovalle, Brett Becker, Karen Mooney, Adam Friedman, Alex Waegel, and Colin McLaughlin