

CROSS SECTION

Stetson University Physics Department Annual Newsletter, Spring, 2007

*Abstracts ~ Area Happenings ~ Featured Alum ~ From the Dean
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Area Happenings

Hello! Greetings from the Physics Department and welcome to this year's edition of CROSS SECTION. Our big news this year: enough money has been raised that we anticipate ground breaking on the addition/renovation to the Sage Hall, the Stetson University Science Center, late next summer or next fall! You can see details of the project including an artist's rendition of the new building on the Science Center's page of the Stetson Web site, www.stetson.edu/sciencecenter. After the project begins, life will become very interesting as Physics, Chemistry, and Biology all get juggled around to accommodate the building and renovation projects. The plan is to keep us all in Sage, moving folks as needed for work being done, and then once the project is complete to settle everyone into their final spaces. We'll be sure to keep you posted on the project in future editions of CROSS SECTION.

On the more day-to-day news... things are continuing along well for the Department. We have a good group of students, with four seniors due to graduate, eleven other upper class majors (students who have finished the University Physics sequence and are in various stages of the degree), and about twelve currently enrolled in the second semester of University Physics (of which not quite half have declared their intent to major in physics). They are a lively group and are making full and good use of the Reading Room for homework, hanging out, and even sleep on occasion.

Our Web site, www.stetson.edu/artsci/physics, has once again taken on a new look. Over the summer, the University asked us to overhaul the page to bring it into line with the look of the University Web site in general, using a new web editing software package. So, Laura, with the help of the folks in the Instructional Media Center, once again undertook a major revision of the site. We're generally happy with how it turned out – though Laura would still like to add more pictures to it. However, it continues to be one of the largest academic pages on the University site. Although one of our primary audiences is prospective students, we hope that should you be looking for information that you find the site useful. If you have any suggestions for improvement, please let us know.

As always, if there is ever anything we can do for you, please don't hesitate to ask. And if you're ever in central Florida, do drop by! Best wishes to you all for this year, and please, keep in touch...

—George Glander, Chair
physics@stetson.edu

“The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity.”

—*Albert Einstein*

From the Dean of the College

Friends of Physics at Stetson,

I greet you at the beginning of what we now know will be a ground-breaking year for the department and the College of Arts & Sciences. Wonderful gifts are allowing us to make improvements to our arts facilities (with new space to house our internationally recognized collection of work by German-American modernist painter Oscar Bluemner) and in our science building, the venerable Sage Hall. With strong personal backing from our Trustees and other donors, we are soon to break ground on about 20,000 square feet of new laboratory space in front of Sage Hall, and we'll continue fund-raising to renovate the old building in phases. When you visit the Physics department, you'll see that we've already made some interim improvements to the old building. Faculty and staff in physics have done a lot of work themselves, and we have used the recent FIPSE appropriation to make sure that we have a strong complement of instrumentation. The constant in all this change is the faculty, who continue their remarkable work as teachers, mentors, scholars, and researchers. They work with a group of majors who are eager for every challenge thrown at them and genuinely excited about the joy of learning physics. In short, a lot like you were when you were in study here! Please stay in touch, do what you can to support the department and the study of physics, and remember to point good students to us or alert us to students who might prosper in study here.

Best,
—*Grady Ballenger, Dean*
gballeng@stetson.edu

Student News & Announcements

Society of Physics Students:

President for 2006-2007: Darash Desai

The Astronomy Club:

President for 2006-2007: Brandon Marsell

Sigma Pi Sigma:

President for 2006-2007: Brandon Marsell

New members, inducted April, 2006: Michelle Adan, Darash Desai

Honors Convocation Honorees—May, 2006:

The George L. Jenkins Prize in Physics, awarded annually to the top student in the University Physics course sequence: shared this year by Christian Pecora and Charles Rareshide

Outstanding Senior: Sarah Caudill

Outstanding Junior: Brandon Marsell

2006 Summer Research Participants (off-campus REUs):

Michelle Adan: "Chaotic synchronization of TWTs" at the University of Maryland, College Park, MD

Brandon Marsell: "The Effects of Magnetic Fields on 90 degree Scattered Polarization at Sodium D1 and D2 Wavelengths." at the High Altitude Observatory in Boulder, CO.

The Class of 2006:

Sarah Caudill—applying to graduate school in physics to study theoretical gravitational wave physics and general relativity.

Danielle Mollman—in graduate school at the University of Florida in industrial engineering.

Abstracts

Every spring semester in Senior Seminar (PS-499), our senior majors present their senior research projects in a variety of formats...

The Effects of Magnetic Fields on 90° Scattered Polarization at Sodium D1 and D2 Wavelengths

Brandon Marsell, Stetson University, DeLand Fl.; Dr. Steven Tomczyk, High Altitude Observatory, Boulder, CO.

In solar research, much information about the sun can be gathered from the polarization state of light radiating from it. Isolating the sodium D1 and D2 wavelengths and analyzing their polarization state, one can detect magnetic fields in the lower limb of the sun [1]. Using the four Stokes parameters I, Q, U, V it is possible to fully describe the polarization state of light at the sodium D1 and D2 wavelengths. A laboratory study was conducted to relate Stokes polarization measurements at these wavelengths to magnetic fields.

The experiment consists of a glass cell containing sodium gas embedded in a pair of Helmholtz coils capable of producing around 200 Gauss. The cell is then illuminated with unpolarized light and a polarimeter used to measure the polarization state of the light scattered at 90° since this is the angle of light polarized at the solar limb. The set up allows for measurement of polarization state as a function of magnetic field.

The results of the experiment reaffirmed the theoretical prediction of zero Stokes U and V polarization and an increase in Stokes Q polarization at a 0° increasing magnetic field for the D2 wavelength [1]. [1] Trujillo Bueno et al., *Appl. J.L.* L53, 566 (2002).

Brandon won the R. S. Jin Award (best oral presentation) at the Zone 6 SPS meeting on February 17, 2007 at Florida Institute of Technology. The best of 16 presenters, Brandon even beat out five graduate students!

Imaging the Magnetic Domains of Magnetotactic Bacteria Using Magnetic Force Microscopy

Justin Black, Stetson University, DeLand, FL; Dr. Kevin Riggs, Stetson University, DeLand, FL

Unlike human beings, many organisms are sensitive to the earth's magnetic field. Magnetotactic bacteria, in particular, use this magnetic field to navigate to a vertical zone within bodies of water that contain a balance of essential nutrients. These bacteria develop a ferromagnetic pellet which is used like a compass needle. The goal of this research was to find and image the magnetic properties of this specific type of bacteria using a magnetic force microscope. Site selection was based on accessibility and water current conditions. The "fishing" device used was a strong ferromagnet secured with a length of rope to a wooden extension. The magnet was covered with a thin plastic film. The goal of this configuration was to submerge the magnet, attract magnetotactic bacteria based on their magnetic properties, and be able to transfer the sample for imaging in a practical way.

To locate biological candidates on the slides, atomic force microscopy was used. Biological features appeared fuzzier than the residual sediment and sand. This is due to

the soft nature of the features interpreted by intermittent contact imaging. Magnetic force microscopy was then performed to distinguish between magnetic and non-magnetic bacteria. In particular, dipole behavior was expected of a bacterium moving by magnetotaxis. Although the dipole behavior of their ferromagnetic components was not successfully imaged, the method of topographical scanning located and imaged some biological features.

From our Featured Alum

A word about this program —

In 1998, the Physics Department established our “Featured Alum” program. Our goal was to provide our current students with peeks into the array of opportunities which await them after their tenure here at Stetson. We encourage our featured alumni to write an open letter to our current majors (and anyone else who may be interested) to discuss why they came to Stetson, what they found here, and how that has impacted their life after graduation. We’ve also encouraged them to share anything they wish to regarding their current professional endeavors (a personal biography, web sites, etc...). We have published this information to the Physics web site: <http://www.stetson.edu/artsci/physics> (choose “Featured Alum” from the menu), and we encourage you to go and browse the page. The letters we’ve received over the years have been so thoughtfully and well written, that archived letters from all former participants can be found by following the links on the page. This year, we are pleased to feature our newest “Featured Alum,” Paul Hastings, here in the newsletter.

You, our alumni, are a distinguished group, and we proudly salute all of you! Please keep in touch with your lives, accomplishments, and goings on — we love to hear how you’re doing and what you’re up to.

Meet our newest Featured Alum:

Paul Hastings

Stetson Class of ‘87



Paul Hastings grew up in Tampa, FL the youngest of 5 children. His father was a Southern Baptist minister which influenced his decision to attend a Baptist school. In 1983 he graduated from Leto High School in the top 5% of his class. He was an avid

tennis player and lettered in the sport. At Stetson, aside from being a physics lab assistant, he was involved in numerous intramural sports including tennis and also joined the Alpha Tau Omega fraternity.

He graduated from Stetson in 1987 with a BS in Physics and a minor in Applied Mathematics. His career began as a high school physics teacher in Delray Beach, FL. He later went on to help start a medical services firm in Delray Beach.

In 1995, Paul and his wife moved to Minnesota to begin their family.

While in Minnesota, he joined Kavouras, Inc., a doppler radar manufacturer, as a business development manager. Several years later, he joined ImpactWeather, Inc. in Houston, TX as their VP Sales and Business Development.

Today, Paul is happily married to Barb Hastings and they have 3 children (Emily 11, Sara 9 and Jack 7). The children have been attending Spanish Immersion schools since Kindergarten and are all bi-lingual.

Open Letter to Stetson University Physics Majors:

I must be completely honest with you from the start that I am absolutely stunned to have been invited to participate in the Featured Alum program. When I graduated from high school in 1983, I really had no idea what I was going to be when I “grew up”. My brother-in-law was a civil engineer and I knew that I wanted to be a lot like him so I decided to pursue a career in engineering. In high school, I made straight A’s in science and math so this seemed like a worthy path.

When it came time to escape to college, I did not feel like I was ready for the giant university culture like UF or FSU, so I pursued only smaller schools like Stetson. I figured that most schools offered similar curriculum the first 2 years anyway and I really loved what I saw at Stetson. Stetson offered a terrific pre-engineering program so I jumped at the opportunity. Once I began my studies, I learned that my passion was not in engineering, but rather physics and math so I decided to remain at Stetson for my entire undergraduate study.

In 1987, I graduated with my BS in Applied Physics. My degree helped me get my first job as a high school physics teacher in Palm Beach County, FL. In Palm Beach County (and many other school districts), science and math teachers are in very high demand. So, even though I was not educated to teach, I was hired by the district and they paid for me to become a certified teacher. I must say that this was one of the most rewarding and enjoyable jobs I have ever had. However, I still hadn’t discovered my passion so I pressed forward. I became friends with the parents of one of my students who happened to be starting a new business. They hired me to help them build the company.

Well, the company wound up doing very well and was eventually acquired by a larger competitor several years later. Although the business was doing very well, and I had discovered my passion of business development, I was losing touch with my physics and math beginnings. So I began to search for a business development opportunity where I could also utilize my physics and math. I landed with a company in Minnesota that was searching for someone with a physics education but with a business development background. That’s me! This company manufactured Doppler Radar systems for business and government and they brought me in to help develop their radar business to take advantage of this developing radar technology. The company also revolutionized

radar data itself by colorizing the various reflected intensity levels. Previously there were only shades of green and you had to be a radar expert to interpret what you were viewing.

I spent a considerable amount of time traveling the country meeting with television stations and electric utilities where I had the opportunity to make technical and business presentations to engineers, IT techs, operations managers and C level executives. Interestingly, it was the electric utility industry where I enjoyed my greatest successes. Almost none of them had any severe weather tracking capabilities to speak of so there was quite a bit of education involved in the early years. Today, every electric utility is well-resourced when it comes to severe weather tracking. In fact, some have even gone so far as to hire their own meteorologists.

Three years ago, I was recruited by another weather firm in Houston to come in and help build their weather business. This was an exciting challenge but one that offered a great deal of upside potential. This weather firm was different from my previous company in that they were more of a service provider rather than a data provider. Their expertise was in hurricane forecasting and offshore weather support.

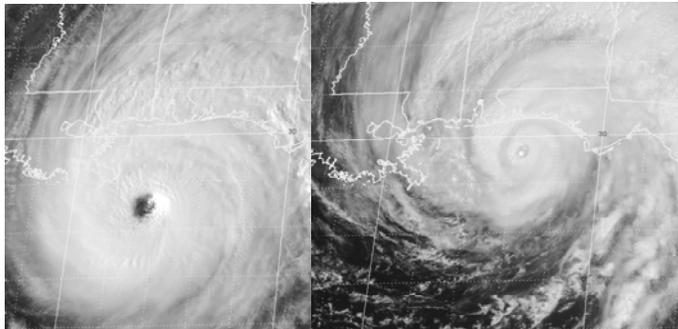
Today, I am VP Sales and Business Development for ImpactWeather, Inc. Most offshore oil and gas rigs in the Gulf of Mexico are ImpactWeather clients and we are quickly expanding internationally. Also, because of our hurricane expertise, we have developed many tools to help our clients make informed decisions. Probably the most popular tool that we developed is a new hurricane classification system called "Hurricane Severity Index". The current system utilized by the National Hurricane Center is the Saffir Simpson Scale. This scale was developed back in 1969 and is based on maximum sustained winds in a hurricane. The 3 reasons why this system is inadequate for today's world are: 1) Only takes into account maximum sustained winds; 2) Doesn't consider a storm's size; 3) Doesn't consider tropical storms.

The Hurricane Severity Index (HSI) looks at both storm intensity as well as storm size. It can also be applied to tropical storms. One thing that we discovered was that large storms can produce a considerably larger storm surge than smaller storms with similar intensities. See the example below comparing 2 recent category 3 hurricanes:

Hurricanes Ivan and Dennis – Two Very Different Category 3s

Hurricane Ivan – 105 kts / 120 mph
Storm Surge – 10-15 ft
Size Points – 21
Intensity Points – 12
HSI at Landfall = 33

Hurricane Dennis – 105 kts / 120 mph
Storm Surge – 6-9 ft
Size Points – 6
Intensity Points – 12
HSI at Landfall = 18



This is very exciting work for me and it never ceases to amaze me how hungry businesses are today for better and more information. If I could offer any advice to you it's this: keep searching for what excites and motivates you. Whether it's educating

America's youth or analyzing the rings of distant planets or discovering the newest micro particle, you can have a positive impact on this world through your love of physics. One thing is for sure, you're at the right place to start your journey. Enjoy your time in the Physics Department at Stetson. I don't think I could have done any of this without the foundation that I built right there in Sage Hall.

Warmest Regards,
--Paul Hastings

From the Faculty

GEORGE GLANDER, *Chair*

LAURA GLANDER, *Administrative Assistant II*

Greetings everyone! This year, George convinced me that since our majors spend so much time in the department office, stopping by to snatch a pretzel or chat, that I should add my two cents and turn this into our news, not just his. So...

From George: I am now into the second year of my five year sentence as department chair, and the extra work (mostly of meetings and generating paperwork) has settled into a routine. Fortunately, my duties as chair do not interfere with the activity that I love, which is teaching. There has been nothing particularly new on the teaching front for me during the last year. I continue to teach University Physics and Laboratory Techniques, and I have been teaching Modern Physics and E&M in alternate years. This semester is a bit of a challenge because I am also teaching Thermophysics as an overload.

I made very little progress with my research last summer. I modified the computer programs that I use for analyzing electron diffraction data so that I could have the computer identify and exclude an undesirable part of the signal, and I introduced some deep-seated bugs in the process. I have reached the conclusion that I will have to start over with the original programs and do the modifications in smaller steps this time. Even when things don't go right in the lab you can still learn something.

I am nearly finished with building our new deck and rebuilding our garage. The remaining work includes putting in a front walk and lots of landscaping. We are already planning my next project which is to replace all of the old single-pane windows in the house with more energy-efficient double-pane windows.

From Laura: The longer I hold this position, the more I go looking for new and challenging things to keep me busy. Hence, the birth of this newsletter years ago, and then our annual t-shirt contest. Last summer, I had some free time at home, and so I took one of each of the departmental t-shirts to date and created a quilt out of them. It was my first attempt at hand quilting anything of that size, and (if I do say so myself) it turned out quite nicely. We hung it in the Physics Department Office, where it is definitely a cheerful addition to the white walls.



Also last summer, I let the Dean of the College know that I was available to work on projects, if he was interested. As perhaps you are aware, I have been responsible for tracking the equipment purchases made with funds from the FIPSE grant (which has purchased \$2.5 million in research equipment and some renovations to Sage) is winding down and not requiring much of my time any more. My timing was good, as it turns out that the editor of the *Bulletin* (the college catalog) is on sabbatical leave this spring, so the Council of Deans asked me to pick up the job for the year. It's been an interesting process so far, as people on all Stetson campuses are involved in making revisions to the *Bulletin*. I've come into contact with more folks at Stetson than before, and it's been a very positive experience. Right now, the first draft is out for proofreading, and by the time you're reading this newsletter it will have been submitted to our publisher for typesetting and we may have our first proofs back. This project, along with helping Kevin Riggs and the Undergraduate Scholarship Committee stage this year's Stetson University Research and Creative Arts Symposium (formerly known as Undergraduate Scholarship Day or USD) in April will definitely keep me busy for the rest of the spring, but that's a good thing! And in and around these projects, I still have to say that my favorite part of this job is simply being in the office and helping our students in any way

possible... I definitely prefer coming to work when classes are in session!

In my free time, I still found myself doing dance costumes for the local dance studio where Beth danced for years. But, this time, I didn't do the simple alterations (Beth isn't dancing there – see below – and other moms can fill in that niche) but worked on some of the new, professional grade costumes that were being designed. It was fun stuff to do (for me!), and it clearly helps me to hone my costuming skills, which I suspect I'll continue to need, given Beth's dancing. I also am enjoying working on some other quilting projects.

And from home... Our kids are now both in high school! One of the reasons I have more free time is that Elizabeth (now 14 and a freshman) has decided to take her dance (ballet) training to the next level, and she is enrolled at the Harid Conservatory in Boca Raton. Harid is a small boarding school (40 students) which dovetails academics at the local high school with a strong pre-professional dance program, with the goals of preparing their students for college and, often, placing them in professional dance companies. Anyway, other than the occasional weekend jaunts down to see her, we spend much less commuting to the dance studio! It's been an interesting experience for Beth. Our society does not really prepare kids to leave home at the young age of 14, and she's had her fair share of homesickness. But Harid runs a lovely, well thought-out program with strong teachers, beautiful facilities, and a very caring res life staff who clearly understand what it means for the kids to be away from home during high school.

Ian (now 17 and a junior) is at DeLand High. His interests continue to run strongly in the direction of international politics, and he loves participating in the school's Model United Nations (MUN) club, this year as club president. His other strong interest is the theatre; he spends a lot of time after school working on shows (usually as a techie), plus he's named theatre as his 6th academic subject for IB, and he's looking forward to taking a newly created theatre tech class as his elective next year. He has begun the process of looking for colleges, and while he's considering Stetson, he'd really prefer to land somewhere in New England or the Midwest. This summer, we'll have a chance to see a couple of contenders when we visit George's parents in Minnesota in June, and we anticipate a trip to New England later in the summer.

Last summer, a family vacation simply didn't come to pass for a variety of reasons, and so we took the vacation budget and bought annual passes to Disney. It feels very decadent...but we've enjoyed the freedom to simply go down and see the fireworks in the evening if we want, and when we have the occasional weekend with neither kid home, George and I enjoy being "empty nesters" and playing at one or more of the parks. We probably won't do it again next year...but instead will enjoy traveling to Minnesota to help George's folks celebrate their 50th wedding anniversary and then to New England as we tour assorted colleges with Ian.

So, all in all, life is as busy as ever, but good. Please keep in touch!

—George and Laura
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ANTHONY T. JUSICK

Well, hello again! Another year has bit the dust with no hurricanes I might add. I have been here forty one years and before the last three years never thought much about

hurricanes much less worried about them. I think perhaps we have passed the peak of the fifty year cycle that seems to govern hurricane generation. We shall see what this year brings. If that turns out to be true then another forty plus years will pass before it's necessary to worry about them again. But try to explain science to insurance companies. We can be assured that rates will stay up even if hurricane occurrence frequency does down. My home insurance was recently canceled as the company informed me they were reducing their exposure in Florida.

This is a good year to be a Gator! I'm a Florida graduate myself, both B.S. and Ph.D. I remember one year when I was a graduate student taking some time off to go out and sit in the stands to watch spring football practice. There was a freshman on the sidelines bouncing a ball up and down off the ground like a basketball. Steve Spurrier was his name. I guess that dates me! But I guess the Spurrier legend will now be added to by one Urban Meyer. I am glad to see this happen.

Not too much happening here. Went through the new version of our one semester math methods course last spring. Turned out pretty well. Covered a really amazing amount of material in one five hour course. The students responded well and we all had a good time! I'll bet some of you remember the good times we had in that course. All that elegant math and the old storyteller to make it more interesting. I had forty eight students in astronomy this fall. That seems to be the new trend at Stetson. Large classes. Had to add an extra lab section at the last minute. The whole experience wasn't as bad as I had envisioned it might be. With a class of forty eight students there's not much room for a personalized educational experience. Fortunately we don't have that problem in courses for our majors. We might wish for a little more of that kind of problem but the number of people that are capable of doing physics has always been small and will continue to remain so. Consider yourselves members of an elite group for whatever that's worth. I should probably quit one of these days but I'm still pretty enthusiastic about what I'm doing and still doing a pretty good job of it so I am not ready to set a date. This is so much a part of who I am that I shudder to think of what I will do without it. That's the way it should be with all of us. Those of us who are lucky enough to have picked the right thing to do with our lives in the workplace. I hope you're among them. One of my sons gave me a sign for my birthday, "A bad day at golf is better than a good day at work." I hope that never becomes true in my life and I hope it never becomes true in yours. Work should be our passion. Giving meaning and definition to who we are. I didn't think I was going to get philosophical this year. But I guess I am the department philosopher. Well, that's it. Hope you are well and life is treating you well, as well. Ooh, all those wells in one sentence. Haven't lost my touch!

—A.J.

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THOMAS A. LICK

One of the most important responsibilities that one has as a scientist is to be objective in the examination of scientific data and to avoid bringing into your examination of scientific data any bias or preconceived prejudices. However, in reading **Wrinkles in Time** by George Smoot and Keay Davidson and also a paper by Frank Tipler, it is evident that in the argument between the Big Bang theory and the Steady State Universe theory, religion, or rather the lack of belief in God played a significant

role. The steady state theory was what Einstein assumed for the universe in his original general relativity theory. The big bang theory was developed by Gamov and others in the 40's and 50's. By the 60's the theory of the big bang had been developed enough that the evidence for it was at least as strong as arguments for the steady state theory. Nobel Prize winner Steven Weinberg was quoted as saying that he preferred the Steady State theory because it least resembled the account in Genesis. This is a bias against a theory not because of an objective examination of its explanation of the known facts, but because it does not agree with the atheists disbelief in the existence of a God. It is not surprising that other steady state supporters felt the same because surveys show that about 90% of scientists are atheists. The strong opposition to the Big Bang theory only evaporated when the 3 K cosmic background radiation was discovered by Penzias and Wilson. But the actual physics appeared stronger on the side of the Big Bang for several years before this discovery. Steady state theorist Dennis Sciama accepted the result but could not resist saying in his defense that "For me the loss of the steady state theory has been a cause of great sadness. The steady state theory has a sweep and beauty that for some unaccountable reason the architect of the universe appears to have overlooked. The universe is in fact a botched job, but I suppose we shall have to make the best of it". It is a pity he was not around at the start to give God advice. God must not have had a good science advisor.

—Tom
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KEVIN RIGGS

On their famous album "Dark Side of the Moon", Pink Floyd has a song titled "Time" which contains line "...and then one day you find ten years have got behind you..." which almost perfectly describes my reaction to the realization that I will have been at Stetson 20 years (2x10) come August of this year. I arrived at Stetson fresh out of graduate school, having managed to avoid serving a year (or more) as a postdoc, which is more often the case these days. I remember being mistaken for a Stetson student on more than a few occasions back then. Unfortunately, that does not happen so much anymore!

Last year I reported that **Sarah Caudill ('06)** was nominated to presented her summer research work at CalTech on the Laser Interferometer Gravitational-wave Observatory (LIGO) project at the Posters on the Hill event on Capital Hill in Washington DC. Sarah was fortunate enough to be accepted to this prestigious event (one of only 70 science students from across the US and one of only 5 in Physics) sponsored by the Council on Undergraduate Research. She and I spent the day (April 11, 2006) lobbying the offices of Senators Nelson and Martinez and Congressman Mica for increased federal support of undergraduate research opportunities. In the evening, she presented a poster of her work in the Rayburn house office building. The session was attended by such notables as Arden L. Bement, Jr, the director of the National Science Foundation, and Congressman Rush Holt (D-NJ and one of only two Ph.D. physicists in congress). You may have seen a picture of Sarah in the *Stetson University Magazine* sitting on Einstein's lap (on a roughly 3x life-size bronze statue) outside of the National Academy of Sciences. Sarah is the second Stetson physics major to present a poster on

Capital Hill. **Jon Gosnell ('04)** also presented his work at Stetson on Magnetic Force Microscopy in 2004.

In the spring semester I taught Electromagnetic Theory (E&MII) and my usual spring edition of the Science of Music. I also supervised the senior research sequence (SR proposal and SR seminar). In my “spare time”, I supervised Sarah Caudill’s independent study course in General Relativity. I think she ended up teaching me about as much of this difficult topic as I taught to her. All I can say is that I was very thankful the text we used (Gravity-An Introduction to Einstein’s General Relativity by James Hartle) came with a solution manual! I again served as the chair of the Undergraduate Research Committee which supervises both the SURE program and the spring research symposium {now titled the “Stetson Undergraduate Research and Creative Arts Symposium (SURCAS)}.

Last summer I spent part of the time working with **Justin Black ('07)** on our atomic/magnetic force microscope. An abstract describing his experiment is presented elsewhere in the newsletter. I also worked with **Chris Eder ('07)** on looking at the vibrational modes of guitar bodies using the Chladni technique. I also presented a workshop at the Council on Undergraduate Research national meeting at DePauw University on “Organizing Undergraduate Research Symposia”, co-presented by faculty from Elon University, Carnegie-Mellon University, Drake University, Valdosta State University and the University of Pittsburgh. Finally, I spent some family time in beautiful Door County Wisconsin, which is essentially the “thumb” of Wisconsin sticking out into Lake Michigan (which creates Green Bay). There are all sorts of picturesque little towns to explore there, and I recommend you consider a visit if you are ever in that part of the country.

Graduating senior and president of the Astronomy club, **Brandon Marsell ('07)** spent the summer doing research at the High Altitude Observatory in Bolder, CO. HAO specializes in solar astronomy and Brandon’s project involved trying to measure the polarization of 90^0 scattering for the Sodium doublet lines found in the sun’s spectrum to gain information on the sun’s magnetic field. . He made major contributions to a table top experiment and the experiments compare favorably to recent theoretical calculations. He plans to report on his results at a Zone Six SPS meeting to be held on Feb. 17, 2007 at the Florida Institute of Technology. Brandon has also been using our new 9.25” GPS Celestron Telescope this past year. Unfortunately, the site we selected for setting up our portable telescopes at Lake Beresford got badly hit by the Feb. 2 DeLand tornado (the telescopes were thankfully safely stored in Sage Hall at the time, but the tornado wiped out about 20 racing shells stored out at the Lake by the Stetson crew team).

Last fall I taught optics and our new intermediate quantum mechanics course for the second time. Now we have both 300 and 400 level courses in the three main pillars of physics: classical mechanics, quantum mechanics, and electricity & magnetism

Although we all are “racing around to catch up with the sun”, I hope you will take some time to enjoy your family and friends and the (macroscopic) natural world around you, for there are other important things in the world besides work and physics (*gasp*). As Pink Floyd says; “...every year is getting shorter, never seem to find the time...”.

—Kevin

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“Freedom of teaching and of opinion in book or press is the foundation for the sound and natural development of any people.”

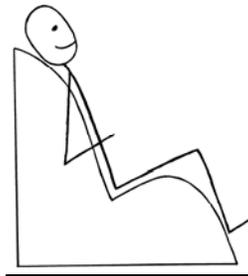
—*Albert Einstein*

This year's T-Shirt contest:

It was another great contest this year, with lots of entries from many students and some of the faculty. Congratulations to Brandon Marsell, '07 for coming up with the winning design idea, which is done up on a black T with silver printing:

On the front:

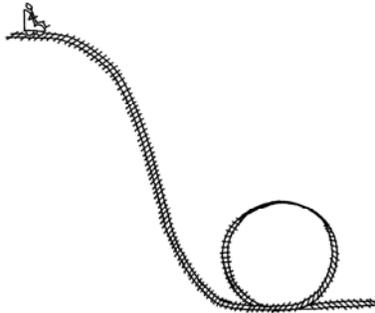
VARISTY PHYSICS



I'm not lazy...

And on the back:

I'm just overflowing with potential energy!



STETSON UNIVERSITY DEPARTMENT OF PHYSICS

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