

SPS 2006 EVENT LINEUP

by Sara Waters

On Tuesday, September 5th, SPS (that is, the Society of Physics Students) had their first meeting of the new school year. There we discussed some of the activities that we will be sponsoring or participating in this year: ROFUs (Research Experience for Undergraduates), continuing the "Physics is Phun" outreach program, paintball, rocket launches, physics GRE review sessions, and more. These announcements were accompanied by free pizza (which is available at all SPS Meetings), and followed by a celebration of ice cream, physics-style: prepared with cream, vanilla, and liquid nitrogen.

The turn out was great, about 30 fabulous physics folks showed up. The next SPS meeting was held on Monday September 25th where Dr. Hill and Dr. Meisel presented information about their research, specifically geared towards undergraduates. These ROFUs not only give students an opportunity for research experience, they also keep students up-to-date on research being done by faculty in our department. Everyone interested is encouraged to attend.

This semester there are also many outreach opportunities available. In previous years we have visited elementary, middle, and high schools in the local area armed with equipment that enabled physics demonstration in an exciting way. Formal physics coursework is often not available to students until the end of high school, and these shows help pique the interests of students about the subject at an earlier age. These demonstrations are called "Physics is Phun"

shows. As for other sorts of "phun" for several years now the Society of Physics Students and the Chemistry Club have been paintball rivals. The showings from both sides tend to vary from year to year, but the desire to shoot each other with balls has remained constant. This is a tradition we plan on keeping this year. The annual paintball game is generally held mid-spring semester.

Other activities we sponsor include physics GRE review sessions held in the SPS lounge weekly, spring rocket building and launching at the Alachua Girl's Club, and Feynman lecture showings. The SPS program at UF has previously received the Outstanding Chapter Award. Whether it's obtained again this year or not, it definitely has the potential to be outstanding. We welcome all majors: the only requirement is a love of physics. To keep up to date on all SPS activities you can keep an open eye when in the building for fliers or check our website at <http://www.phys.ufl.edu/~sps/>.

Cheers,
Sara Waters
SPS President



who we are

UP is a monthly undergraduate physics newsletter sponsored by the University of Florida's chapter of the Society of Physics Students, for students, by students. We seek to strengthen the undergraduate physics community at the University of Florida by providing a forum for undergraduates to share their views and experiences with each other and acting as a source of information for opportunities and events in physics.

**The Alachua County
Friends of the Library
Booksale will be held
October 21 - 25.
For more information and
other upcoming dates &
deadlines visit
UPNews ONLINE**

<http://www.phys.ufl.edu/~upnews>

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PROFESSOR SPOTLIGHT

by Harold Rodriguez

You're already familiar with the warm smile he brings to class every day, a sign of his enthusiasm for the subject. If you're a Physics major, chances are you've taken Electromagnetism with him. I caught UP (get it?) with Dr. Christopher Stanton to learn a little more about him.

UP News: So, you're actually a Gator yourself! You went to UF for your undergraduate degree, correct? How has the UF Physics department changed since you were here?

Stanton: It's certainly gotten bigger. More people (from undergrads to post-docs to professors) are in the department. There's, of course, the new building.

UP: Isn't the old building used for Journalism or something now? How does it stack up to NPB?

S: The old building is now home to Geology. It was OK, but NPB is much nicer. Everything's newer and better.

UP: How do the research facilities compare?

S: There's ample research space in NPB, which allows for a rise in research conducted by professors and students. But if you check back with the Geology building, you'll still find some low-temperature labs, and the like.

UP: Has the emphasis on what's taught in the Physics curriculum changed much over the years?

S: Not really. Most of the curriculum on the undergraduate level is the same as it was before; it's kind of how the discipline works. You need to be at a graduate level to really delve into forefront topics.

UP: Is anything else different?

S: Well, our SPS chapter is much bigger. Back then it was a small group, but what SPS members used to do was have Friday night Happy Hour, with drinks and popcorn. Maybe hang out at the library. And in the old days, the professors would actually drink and talk with the students at Happy Hour; some professors who've been here for a while may remember that.

UP: Do you have any hobbies?

S: Yes, I bike a lot.

UP: I'm noticing you have your road bike here, but ever do mountain biking?

S: Sometimes. I'll go hit some dirt trails on a bike or on foot. I also enjoy hiking the canyons out west.

UP: What motivated you to start doing physics?

S: I don't know. I just always liked science and math... and I didn't want to become a medical doctor (laughs).

UP: What kinds of things are you working on now, and how do students contribute?

S: I work in the field of theoretical condensed matter physics, studying the electronic, optical, and transport properties of semiconductor heterostructures and nanostructures.

UP: (long silence) Wow!

S: A lot of different things need to be accomplished for any given project, so that's where undergrads, grads, and post-docs come in: they'll all work on separate pieces of a problem, and the pieces will be glued together for a certain project.

UP: Do you have any advice on getting research material published?

S: I think the best thing is to start early: as an undergrad, start to do research. This will greatly increase your chances of getting something respectable published. For example, a student was working for me last semester doing research, and it turned out that his results were quite novel, so he got to publish a nice piece on it. Also, starting to do research early can lead to some great papers later on, even if the research you initially start doing doesn't give extraordinary results. At least you'll have the experience under your belt.

UP: (At this point, Dr. Stanton is noticing my '05 Society of Physics Students T-shirt, featuring caricaturized quarks).

S: That's a very cool shirt. I have one like that which I tend to wear on the weekends. People come up to me and say, 'That's very cute, what does it mean?' So I tell them, 'Well, it has to do with particle physics!', and they're like 'Mehhh...' (laughs). It's definitely a fun shirt.

UP: People think the quarks on mine are M&M's but... Anyway, congratulations on becoming a father! Do you think you'll try to motivate your daughter to go into physics?

S: It's way too early to tell. It doesn't matter to me as long as

she's happy. I mean, you should be happy doing what you're doing, whether it's football, physics, or whatever.

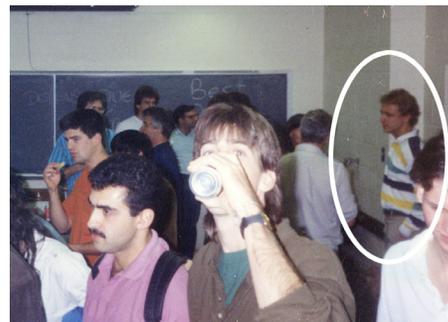
UP: Any last words of advice for undergraduate Physics majors?

S: Really, make sure this [Physics] is something you want to do. Find something you like within the whole field of physics, whether it be making calculations or working in the lab, and do that. If you like what you're doing and you're excited and passionate about it, then keep doing it.

UP: I've actually met a lot of ex-Physics majors, who tried to do the curriculum for a while but gave up.

S: Well, it is a lot of work. Physics is tough! And if you're not entirely excited about it, it's going to be harder to succeed. But if you genuinely enjoy it, keep working at it.

The following pictures were uncovered during an archeological dig in the SPS lounge. Spotted in the pictures are a young Dr. Stanton. Unfortunately, the results of our carbon dating tests have proven inconclusive as to whether the images are from Stanton's undergraduate career (he graduated from UF with high honors as a physics major in 1980) or during his early years as a professor (he rejoined UF in 1988 as an assistant professor.)

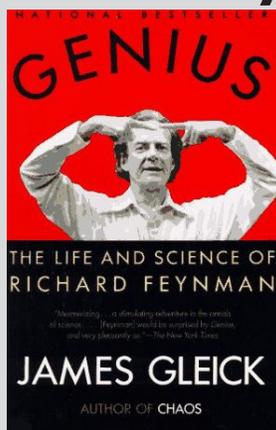


BOOK REVIEW

Genius: The Life and Science of Richard Feynman

by Jonathan Young

Given the abundance of Feynman biographies, one may think that another one would be unnecessary. Yet James Gleick's addition to the already overflowing collection of Feynman books offers a unique and insightful look into the life of one of the most colorful characters in scientific history. Nominated for a National Book Award, *Genius: The Life and Science of Richard*



Feynman is a worthy read that is capable of inspiring those who aim for a career in science. A defining characteristic of Gleick's work is the manner in which Feynman's life is seen through the eyes of those who were closest to him and knew him well. The book is filled with an abundance of anecdotes from such eminent physicists as Freeman Dyson, Murray Gell-Mann, Julian Schwinger and others. Furthermore, Gleick, who is also the author of *Chaos: The Making of a New Science*, showcases his uncanny ability to vividly portray scientific people and dramatize breakthroughs in physics. This is no small task, as any attempt to explain the intricate work of Feynman and his colleagues' risks becoming an overly technical treatise on modern physics. Though Gleick does his best not to skimp on the details of the physics, his book still makes for a fairly smooth read.

Gleick follows Feynman from his humble beginnings at Far Rockaway to his accomplishments at MIT as an undergraduate. The reader is then immersed in Feynman's progress through graduate school at Princeton and his subsequent activities at Los Alamos as part of the Manhattan Project. Finally, the career of Feynman at Cornell

and Caltech spans the remainder of the biography. The book is rich in both depth and breadth, with a substantial number of pages dedicated to Feynman's personal life. Thus, at the conclusion of the book, not only does Feynman the physicist stand out, but Feynman as a person is also brought to the forefront. This is especially evident during the chronicle of his life with his first wife, Arline Greenbaum.

Among the many interesting portions of the book are Gleick's brief forays into the concept or notion of genius. For, example, he touches on several of the common theories about whether genius is made or born and includes discussion on other personalities who are most plainly and universally associated with the word genius. Yet in these sections of the book, Gleick somehow leaves the reader yearning for more. There are not many original thoughts on the subject of genius that Gleick offers at length. Another slight drawback to the book is the complete absence of mathematical equations. While Gleick attempted to gear the biography towards the layman, he walks a fine line by also refusing to gloss over many of the details of Feynman's work in physics. As a result, some portions of the book are wrapped up in a seemingly unending torrent of metaphors that ultimately do not convey much. Despite these shortcomings in the biography, *Genius: The Life and Science of Richard Feynman*, offers a commendable introduction to those who never knew Feynman personally.

BUSTING MYTH BUSTERS

by Larry Camarota

For a while, the term 'Discovery Channel' was closely linked in the minds of people everywhere to wildlife in the African Savannah. Two things happened to change that. First, those shows now appear on Animal Planet. But more importantly, the Discovery Channel now has a show that almost everybody knows the name of: MythBusters.

For those unfamiliar with the show, two, ex, special effects professionals (Jamie and Adam) go into the business of finding and testing myths and urban legends. After testing the famous Archimedes Death Ray, they picked up a second crew (Kari, Tory, and Grant). Along with their unfortunate test dummy named Buster, they have tested hundreds of myths, such as the JATO car, the personal jetpack, and the exploding toilet.

However, with this fame has come a certain amount of criticism. There are many who feel that the methods on MythBusters are unscientific. To a certain degree, these critics are correct. The MythBusters often base their determination upon a single trial run. With some of their myths this is sufficient (such as myths claiming to be common occurrences). However, many of the myths are 'busted' simply because Adam and Jamie don't manage to recreate them, or because of some factors that have been ignored by the experiment.

Nevertheless, MythBusters has done a terrific job as a show on Discovery Channel. It has sparked interest in the scientific method, and has gotten many people to start thinking critically about myths that people take for granted. As pure science, MythBusters is busted, but as entertaining and educational television, it passes.

APPLYING TO THE NSF GRADUATE RESEARCH FELLOWSHIP PROGRAM (GRFP)

by Amruta J. Deshpande

The NSF Graduate Research Fellowship should be no stranger to any undergrad in his or her final year. It is among the most important fellowships available for prospective graduate students. It provides \$10,500 yearly towards education costs, \$30,000 yearly in stipend for 3 years in addition to a one time \$1000 travel grant. Unparalleled in financial award and prestige it takes a lot of work on your part to apply. Below is a compilation of advice received from former recipients, non-recipients, as well as panelists and the NSF itself. Also find a brief overview of criteria.

If you're a US Citizen, National or Resident Alien and have completed no more than 12 months of full-time graduate study, you are eligible to apply to the fellowship*. You are required to submit your personal profile, education and work experience, planned graduate program, personal statement, previous research experience, proposed plan of research, and a minimum of 3 references. This mouthful has translated to 40 hours of average minimum work per successful application in the past. There are 5 essays in the criteria mentioned above, all of which require careful consideration. Deadline for your application for Physics is November 13th, and all other fields' deadlines are earlier in November (references are due by 5 pm December 1st).

To start off, read every word of the fellowship information available on the NSF website (<http://www.nsf.gov/pubs/2006/nsf06592/nsf06592.htm>). If anything is unclear, especially eligibility and other requirements, contact NSF to make certain and follow their directions to the T.

References will take the most time (not for you, but for the professors who will write them). Choose your professors wisely and well ahead of time (~1.5 months in advance); they are very important to your application. For general advice on asking for letters, read the Undergraduate Advising Newsletter sent out via email by Dr. Hershfield (if you email upnews, we will send it to you as well). In addition to suggested provisions in this

article, provide your professors with your research proposal and evidence specific to what you want the ref. letter to focus on. Letters should confirm details you mention throughout your application. Sample areas letters can focus include your proposal, research ability, academics, leadership and outreach activities, etc. Your research proposal and ability are most important, so emphasize them with corroboration.

Your application will be read twice by professionals in varying fields and thrice if you are in the top 4 percent. Five hundred professionals meet for two days and go through 24,000 applications to choose recipients. Below are general pointers on what they'll look for in your essays.

General Pointers

- 1.) From your application, panelists will judge your Intellectual Merit as well as the Broader Impacts you propose. These you will address through your 5 essays and ref. letters. Do not shy on the Broader Impacts criterion as it is crucial.
- 2.) Previous research experience should show your research ability, regardless of successes or failures.
- 3.) Your proposal and research ability will be the strongest part of your application.
- 4.) Use a strong active voice. Say "I will," instead of "I hope to." in your plans.
- 5.) Be SPECIFIC! Cut out riff-raff. It's the best way to be taken seriously.
- 6.) NSF wants to see that you'll take up leadership roles in your field, so you must address leadership and outreach in any of your 5 essays!
- 7.) Mention any tutoring or volunteering you've done.
- 8.) They want to see how you're working to improve your field. One successful application mentioned a student formed thesis review group which worked to eliminate general difficulties in thesis writing.
- 9.) Finally, REIVEW! REVIEW! REVIEW! Remember your audience: you may get an economy professor reading your proposal, so it should be understandable yet contain sufficient technical detail. Have friends, professors, and people within and outside your field review your essays and proposal during various stages of your writing (but don't forget to be considerate to

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CALL FOR WRITERS

UPNews is always looking for undergraduates who want to contribute. If you'd like to get involved, e-mail us at upnews@phys.ufl.edu (no experience necessary)

them). Eliminate grammatical and spelling errors.

-Seize the reader's attention with your first sentence. Panelists are reading applications for 2 days straight so make yours stand out and ask someone not interested in your field if they find your essays boring. Twenty of the forty hours will go in reviewing, rewriting and polishing.

This column is only a general preview of all you'll consider in applying to the NSF fellowship. Everything mentioned above is important, yet it is not the entire set. You'll find more advice at the following website (and others when you google "NSF GRFP!"): <http://socrates.berkeley.edu/~gamble/nsfadvice.pdf#search=%22NSF%20GRFP%22> (This one is particularly helpful)

*more specific details at <http://www.nsf.gov/pubs/2006/nsf06592/nsf06592>.

Additional References:

Application Guide: https://www.fastlane.nsf.gov/grfp/html/GRFP_Applicant_User_Guide.pdf

NSF Application: <http://www.nsf.gov/pubs/2006/nsf06592/nsf06592.htm>