

Undergraduate Researcher Spotlight

By Linda Watson

Colin Shepherd

UP News interviewed Colin Shepherd, a senior physics major, to get some insight into his research and accomplishments as SPS president, as well as ideas for SPS in the future and advice for physics undergrads.



Colin Shepherd is a Senior Physics Major. He wishes to continue research in condensed matter physics at graduate school.

Colin started out as a Materials Science major, so when he crossed over to Physics, Condensed Matter Experiment seemed the logical course. He has been doing research under Dr. Arthur Hebard since August 2002.

The first project Colin delved into looked at the electrical and magnetic properties of Gadolinium Silicon (GdSi) compounds. The results of this project were inconclusive, however. Next, he worked with Buckyballs, which are clusters of carbon atoms in a geodesic dome structure. He attempted to make these Buckyballs ferromagnetic by implanting other carbon atoms into the Buckyballs. Unfortunately, the Buckyballs were uncooperative. Currently, Colin has been looking at the optical properties of trilayer capacitors of Aluminium,

Aluminum Oxide and Indium Oxide. He wants to see how running a voltage across a capacitor (known as gating in the business) affects the reflection and transmission properties of the capacitors.

While he says that the amount of time he spends in the lab fluctuates pretty heavily, Colin spends about 13 hours per week doing research.

In addition to doing Condensed Matter experiment at the UF Physics department, Colin also went to Cornell in Ithaca, NY to complete a REU (Research Experience for Undergraduates) last summer. There, while working with Jeevak Parpia and Harold Craighead, he looked at the fracture strength of single-crystal silicon rods with micron scale dimensions. "Fracture strength is basically the amount you can bend one of these rods until it snaps," he explained. The crystals they were examining were groups of silicon atoms all aligned in a certain pattern, the number of atoms varying. He concluded that the fracture strength is stronger at smaller dimensions, which is the hypothesis the group started out with.

After having worked on many Condensed Matter experiment projects, Colin is planning on continuing that path when he goes to graduate school.

While Colin has spent many hours in the lab, he is also SPS president this year. During his term, Colin and the other SPS officers have tried to expand outreach projects including Physics is Phun shows. Also, they

Condensed Matter, Grad School, and Buckyballs
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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.

*3 - 2 - 1 Blast Off!
Building Rockets at
the Girls Club
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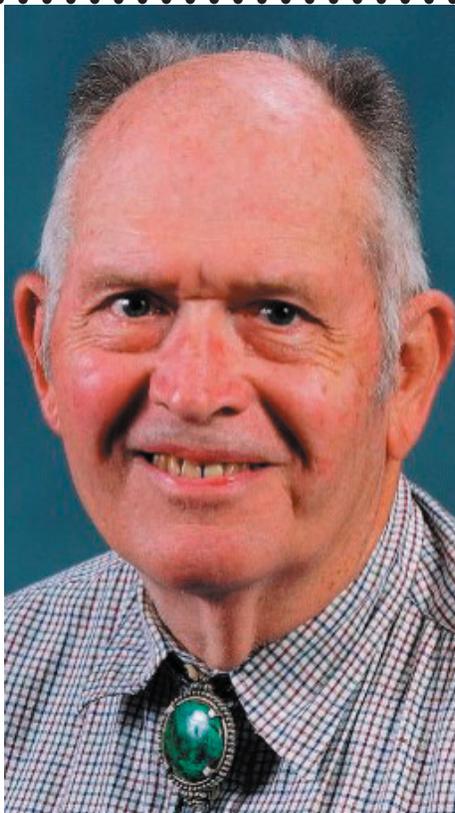
Getting to know you: Advisor Series

Part Two of Four - Dr. Eugene Dunnam

Every physics major should talk to one of our four excellent undergraduate advisors in the physics department: Darin Acosta, Eugene Dunnam, Selman Hershfield, and Yoonseok Lee. Their advising times and locations are:

Acosta	M 1-2PM W 1-2PM	NPB 2035
Dunnam	M 10-11AM T 10-11AM	NPB 2364
Hershfield	R 2-3PM F 2-3PM	NPB 2138
Lee	T 2-4PM	NPB 2233

We are running a series of advisor spotlights, continuing with Dr. Eugene Dunnam, to give you a feel for their backgrounds. So maybe the next time an advisor absolutely blows you away with his infinite wisdom, you can express your gratitude by cooking his favorite dish or taking him out to his favorite sport ... or you can just thank him nicely.



Dr. Eugene Dunnam
dunnam@phys.ufl.edu
352-392-1444
NPB 2364

Specialization/field

Experimental physics, originally nuclear, now mostly atomic.

Birth place

Alexandria, Louisiana [central LA]

Favorites:

food - Hard to decide....I guess I'd have to say, seafood in most any form except octopus, but that competes with Southern specialties like cornbread, mustard greens, pork chops, rice, etc. [This question is gonna mess up my diet today!]

movie - *The List of Adrian Messenger* and *The Man in the White Suit*

book/author - Another hard one, since I read a lot, especially whodunnits. Favorite authors in this category are Dorothy L. Sayers & John D. MacDonald. I'm currently reading [& enjoying] Carl Hiaasen's "Kick Ass"

programming language - C++

hobby - Music, especially choral & pipe organ. We're building a room on our home to house the pipe organ I acquired last January. Gardening, especially growing chile peppers

sport - Football

quotation - *Nil Illegitimo non Carborundum*

color - Blue

operating system - Macintosh OS 9.3 [I don't like OS X]

physics hero - Robert J. Van de Graaff

...Next month's issue with Dr. Hershfield

SPS News and Events

Meeting Minutes Upcoming SPS Events

2/12/04 SPS ROFU Meeting

6:30 PM

Speakers:

Experimental astrophysics -
Dr. Laura Baudis (*far top right*)

Condensed matter theory -
Aditi Mallik (member of Dr. Jim Dufty's group)

Condensed matter experiment -
Dr. Ho-Bun Chan (*far bottom right*)

Month Events:

Wednesday February 25

Physics is Phun show at Girls Club

Saturday February 28

Physics open house for prospective physics majors

Sunday, February 29

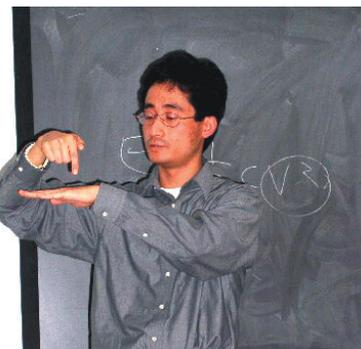
SPS vs. Chemistry Paintball Fight (*right*)

3/4/04 SPS Meeting - NPB1101

5:30 PM

**Elections for next year's
SPS officers will be held.**

Free food provided.



Looking Out and In

A Review of Contact by Carl Sagan

By Cathy Yeh

Contact, by Carl Sagan, is about the search for extraterrestrial intelligence by a brilliant radio astronomer, Ellie Arroway. Her detection of a message from another corner of the Milky Way marks a new chapter in the history of mankind. As decryption of the message progresses, the evidence that there are other beings in the universe sends ripples of awe and anxiety across the planet.

Sagan's account of the reaction of citizens of Earth to the message is at once humorous, critical, and sympathetic. Through his portraits of various groups - scientific, religious, political, and otherwise - his deep understanding of the human character becomes apparent. Each group receives fair treatment, possessing elements of both the rational and ridiculous. Some scientists working on the message are egotistical and insecure, eager to claim credit at any opportunity, while others are humble and have the welfare of mankind at heart in addition to the advancement of

science. The mosaic of personalities and cultures culminates in a vision of mankind, of not a little craziness, of curiosity and exploration, and of our common destiny as inhabitants on the same small and precious planet.

Ellie's personal story unfolds with the development of events surrounding the message and its instructions to build a mysterious machine. While incredibly successful in her professional life, she suffers privately from the loss of her father in childhood and tensions between her mother and stepfather. Sagan deeply moved me with his portrayal of the relations between child and parent and the painful misunderstandings sometimes arising between them that can result in alienation. Ellie matures as she is forced to examine submerged feelings and resentments and her egoism. As protagonist, she is still very human, and I think readers can recognize a few of her faults in themselves. The book concludes with Ellie's realization that "She

had studied the universe all her life, but had overlooked its clearest message: For small creatures such as we the vastness is bearable only through love." And thus, Contact is less about discovering aliens elsewhere in the universe than establishing contact with the people around us.

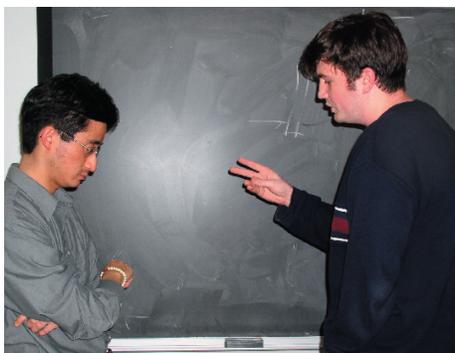
I think the burning desire to find answers, whether through science and/or religion, strikes a chord in everyone. Without sinking into sentimentality, Sagan shares his vision of hope and love. I am always impressed by his knowledge of not only science, but also history, politics, religion, and numerous other subjects. One of Sagan's descriptions of Earth from the vantage of space particularly resonates with me: "You get to thinking of the Earth as an organism, a living thing...National boundaries are as invisible as meridians of longitude, or the Tropic of Cancer and Capricorn. The boundaries are arbitrary. The planet is real."

Condensed Matter, Grad School, and Buckyballs

...continued from Front

concentrated on the ROFU (Research Opportunities For Undergraduates) program, which he says "is to further encourage undergraduate research participation."

When asked what he would like to see from SPS in the next few years, Colin said that he would still like to see more concentration on outreach. In addition, he would like to have SPS put forth more effort to help younger students become immersed in the department, as well as see SPS members continue to create a friendly, relaxed environment in the lounge. He also said, "It couldn't hurt to have a few more FUN activities."



Colin talks with Dr. Chan after his lecture at the February SPS meeting.

When asked to give some general advice about being a physics student, Colin said "You should take Advanced Lab II when you have an easy

semester, work on your essay writing skills before taking the general GRE (grad schools might actually care), and talk to professors you know about what grad schools might be good for you." Finally, for those starting to think about the Physics GRE, Colin wanted to repeat some advice he was given from Taylor Hughes, a 2003 UF graduate, that the best way to study for the Physics GRE is to do all the odd problems of Halliday, Resnick and Walker I-IV and the Modern Physics book. Colin also wanted to add that reading the Modern book cover to cover to get the major concepts helped him a lot.

Goings On

SPS and Around the Department

By Cathy Yeh

Physics Open House February 28, 2004

The physics building welcomed prospective physics majors Saturday morning. The visitors were split into two groups guided by Dr. Hershfield and Dr. Lee in a tour through various laboratories. Some faculty gave brief talks and answered questions from students and parents. A few members of SPS (Layla Booshehri, Colin Shepherd, Cathy Yeh) were also present to offer perspectives on the undergraduate physics program.

SPS Paintball Fight February 29, 2004

The Society of Physics Students vs. Chemistry Club paintball tournament took place on a sunny Sunday afternoon at Rocky Creek Paintball. The physics students were grossly outnumbered but valiantly tried to

hold their own. Participants from SPS were Eddie Calleja, Jim Davis, Amruta Deshpande, Tim Jones, Raj Mehta, Jacob Tosado, and Cathy Yeh. Bath bead-sized paintballs were heavily exchanged between the opponents, with both teams suffering losses as the sound of popping paintball guns and cries of "I'm hit!" echoed across the field. SPS eventually changed its plan of creaming the Chemistry Club to surviving a new menace, a squad of paintball veterans outfitted in army fatigues sporting more advanced weapons and strategies. Physics students were dropping like flies; an unfortunate few were even eliminated in friendly fire during the heightened confusion. However, at the end of the day, a good time was had by all, with SPS team members happily comparing war wounds and combat stories as they walked off into the setting sun.

3 - 2 - 1 Blast Off!

By Amruta Deshpande

"Are we really going to build rockets today?" exclaimed Kadie as boxes full of rocket kits were brought into the pink room of the Girl's Club of Alachua County. On Thursday, February 26th, Becky Gorla, joined by Linda Watson, Joe Gleason, Cathy Yeh and Amruta Deshpande, arrived with boxes full



Becky Gorla, one of the organizers of the activity, and Linda Watson, SPS member, carefully aid rocket construction

Building Rockets at the Girl's Club

of rocket fun. The girls jumped off the tables and into their seats to get ready for a new adventure.

Thursday was the first of a series of rocket building sessions that will conclude with a launch. Construction was on the agenda for the first session. After ripping through a handful of plastic packaging, the girls began to attach the various parts of the rockets together. They were building one foot high GNOME rockets with silver bodies and blue tails and noses. These rockets feature red ribbons that flow out of the body of the rocket upon their launch, giving the semblance of fire.

The girls were full of curiosity about their new rockets and immediately began to postulate how the parts would fit together to make a rocket. SPS members who accompanied Becky witnessed prime examples of the increasing aptitude of today's youth. They commented on the excellent reading abilities of the younger girls who were following the

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We welcome your news!
Please send submissions to
upnews@phys.ufl.edu by
the third Monday of each month.



Amruta Deshpande helps a young girl during Thursday's rocket session at the Girl's Club.

building instructions without any problem.

Thursday's session was thus a learning experience for the girls at the club as well as the SPS members. At the next session, more girls will join in building while girls present for the first session will finish. At the highly anticipated final session, the girls will launch rockets from a remote controlled launch pad.