

# PROTON



PHYSICS REPORT ON THINGS OF NOTE

VOLUME 7 NUMBER 5

## News from the "Pit" contributed by Professor Darin Acosta

This is the year that the Large Hadron Collider (LHC) will finally switch on, and high-energy physicists will explore a new energy frontier for the first time in 20 years. Anxious theorists worldwide



*Darin Acosta checking a few of the many cables connected to the "CSC Track-Finder" electronic crate, the pride of the UF team that constructed it.*

will finally learn the fate of their proposed theories and models, and see if they are lucky enough to win a trip to Stockholm. Ninety meters below ground, near the town of Cessy, France, the pace of activity is high as experimenters complete the cabling, piping, and

commissioning of a high-tech marvel – the Compact Muon Solenoid experiment. CMS completely fills a vast excavated cavern. UF physicists contributed to the design and construction of detectors and electronics for detecting muons, and now they are contributing to the commissioning of those systems.

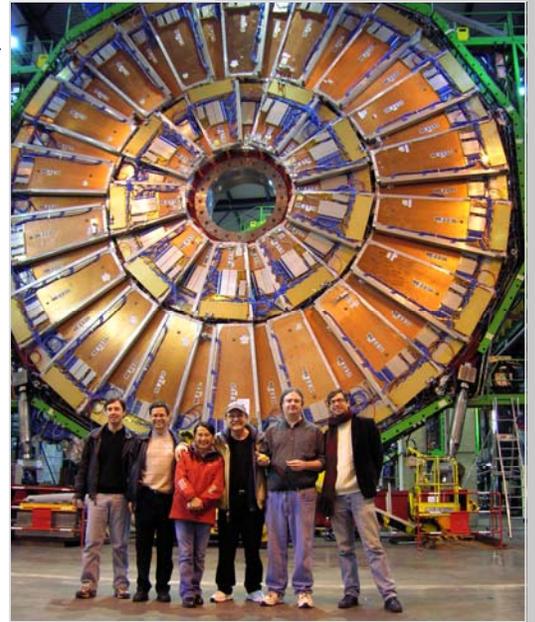
On most nights you can find **Prof. Ivan Furic** and his student **Nick Kypreos** in the "pit" logging data and debugging problems with the muon system in a race to meet the tight schedule before first beams. Their mission is to deliver "golden runs" where everything goes right in operating the detectors to capture cosmic-ray muons energetic enough to penetrate through 90m of earth. When problems are discovered, they sometimes have to climb onto 15m tall steel disks to get to a problematic cable or electronic card. There are over 1000 such cards, so the task is time consuming.



*Nick Kypreos, Ivan Furic, and Joe Gartner in the pit. Note the fashionable CERN-issued green work pants!*

Life in the pit is primitive. The underground control room can barely fit everyone during the day given all the activity, and certainly there are not enough chairs. But Europe maintains its civilization, and there is an espresso machine in the control room and picnic tables to sit at (indeed an odd sight amongst the concrete walls and steel cable trays). There are no windows to look through underground save for the ones on the monitors, and the noise from racks of electronic equipment can be deafening. Not quite as deafening as the evacuation alarm when it sounds, however. But evacuation can take some time when you are 30 floors below the surface. There are only 2 elevators, and they hold only a fraction of the people underground at any one time these days. But unlike the Titanic, there are sealed shafts where one can wait in safety with enough oxygen for up to 90 minutes in the event of a fire. There are also foam dispensers that can fill the cavern in a matter of minutes. **Prof. Acosta** and student **Joe Gartner** tested their fitness recently by climbing the stairs to the surface—it took just over 5 minutes and the 40-something professor held his own against the brash young rugby player! Upon exiting, a concerned look crossed the face of the technician coming down: "Does the elevator work?" It's a common question, since the elevator is custom-made and breaks often.

Currently all 1000-ton pieces are installed into the cavern. It took 16 months, and nothing is expected to return to the surface any time soon since the crane was dismantled and removed. Cabling is nearly complete, and the last sections of the beam pipe that will contain the counter-rotating proton beams are being installed through the heart of the experiment. The 27km ring of superconducting dipole magnets is currently being cooled to below the lambda-point of liquid helium. If all goes well, the first protons should circulate around the LHC in late July. Two months later, the first collisions ever at 10 TeV should take place. At that point, it should begin to get busy.



*Darin Acosta, Rick Field, Rick Cavanaugh and collaborators pose for a Christmas photo in front of one of the CMS endcap muon disks before its lowering into the pit.*



*Bustling activity in the CMS underground control room.*



*The Mythbusters come to town page 2*



## Physics Professor plays host to the *Mythbusters*

It came as a surprise to **Prof. John Yelton** when ACCENT, a UF student run Speaker's Bureau, called and asked him to moderate an event at the Stephen C. O'Connell Center which would feature the hosts of the widely popular Discovery Channel show, the *Mythbusters*. In separating truth from urban legend, the *Mythbusters*, Adam Savage and Jamie Hyneman, take on three myths per episode and use modern-day science to test what is real and what is fiction. Being unfamiliar with the *Mythbusters* and having only a short time to prepare, Yelton watched several *Mythbuster* episodes on DVD and did some research on the internet. "ACCENT chose me because one of their staff took PHY 1033C when I taught it", explains Yelton, "She recommended me."



When the evening of the event arrived, Yelton, the *Mythbusters*, and ACCENT staff met for dinner at the Bonefish grill on Archer Road. Dinner was spent discussing how they wanted to evening's event to flow, and also various science topics. "I was impressed with their knowledge" says Yelton, "they really have a wide range of interests. Jamie asked me how string theory could be related to real life – I didn't have a very good answer!" After dinner, the group was whisked off in a limousine to the O'Connell Center where they were greeted by a near capacity crowd of 11,000. "I was shocked to see so many people" admits Yelton "I was more than a little nervous. I don't get 11,000 people attending my physics lectures."



The show opened with Yelton, as moderator, prompting Savage and Hyneman with questions of interest such as "Do the two of you get along off-screen?", and "Did you always want to be TV stars?" The moderated session was followed by questions taken directly from audience members for the Mythbuster duo.

ACCENT is the largest, student-run, speaker's bureau in the nation. Created in 1967, ACCENT is celebrating 40 continuous years of bringing prominent, controversial, and influential speakers to the University of Florida. ACCENT strives to bring world class programming to educate, enlighten, engage, and entertain the student body. 2007-2008 speakers have included Senator John Kerry, Bill Nye the Science Guy and Jack Kevorkian.

## FACULTY NEWS



**Prof. Darin Acosta** has been selected to receive a 2008-2010 University of Florida Research Foundation Professorship. These three-year professorships recognize faculty who have established a distinguished record of research and scholarship that is expected to lead to continuing distinction in their field. Congratulations to Darin for a well-earned distinction!



The U.S. Department of Energy has named **Assistant Prof. Ivan Furic** an Outstanding Junior Investigator (OJI) (OJI awards are the equivalent of NSF's CAREER awards). These competitive and prestigious awards are given to tenure track faculty and are meant to identify the best young researchers in high energy physics. Ivan's award will support his research on "TeV Muons - Heralds of New Physics at the LHC". The DOE will provide \$82,000 per year in support of his research. Congratulations Ivan!



**Jacobo Konigsberg** is quoted in the recent issue of *Scientific American* in the article, "Matter-Antimatter Split Hints at Physics Breakdown". Read the full article at <http://ww.sciam.com/article.cfm?id=matter-antimatter-split-hi>



**College of Liberal Arts and Sciences Graduate Programs Land in the Top Ten of all Public and Private Universities in the U.S.** Source: CLAS News

*U.S. News and World Report* has released its 2009 Best Graduate School rankings and three degree programs in the College of Liberal Arts and Sciences—audiology, analytical chemistry, and statistics—have been named to the Top Ten of all public and private schools in the nation. Criminology was barely edged out of the Top Ten, coming in an impressive 11th nationally, as well as speech-language pathology, which ranked 12th. Here's how other programs in CLAS ranked nationally out of all public and private colleges: Biological Sciences, 48th; Chemistry, 36th; **Physics, 36th**; Psychology, 66th. For more information on the methodology of the rankings, visit <http://www.usnews.com/articles/education/best-graduate-schools/2008/03/26/about-the-rankings.html>.

## CCMS 2008 Summer Lecture Series

The Center for Condensed Matter Sciences summer lectures will begin July 21, 2008 and will be given by **Professor Greg Stewart**. For more information on the lectures please visit <http://www.phys.ufl.edu/ccms/lecture>.



## Student News & Awards



**Victor Albert**, an undergraduate Physics Major working with **Frank Harris** and **Prof. Jack Sabin**, has won the prestigious Goldwater Fellowship. Victor has one published paper so far, and has another one in the works. He is a spectacular student, and well deserves this award.



**Don Burnette** received a National Science Foundation Graduate Research Fellowship. Don is a triple major (Physics, Math, Electrical Engineering). He will also receive a masters degree in Physics from UF. While at UF, he did research with **Prof. Greg Stewart** and was a member of UF's national champion Subjugator robotic submarine. He will attend Carnegie Mellon University next year as a graduate student in robotic engineering.



**Francisco Rojas** (photo center) receives the University of Florida 2007-2008 Graduate Student Teaching Award. He is one of 22 graduate students in the university to receive such recognition this year. With his family in attendance, Francisco received the award at a reception on April 24th, and he was also recognized during the spring commencement ceremony.

**Deepak Kar** presented his work, done with **Prof Rick Field**, titled "Using Drell-Yan to Probe the Underlying Event in Run 2 at CDF" at the American Physical Society April meeting at St. Louis. He received a travel grant from Division of Particle and Fields (DPF) for this meeting. He also attended the 2008 Phenomenology Symposium held April 28-30, 2008 at the University of Wisconsin-Madison to present the same work.



## GRADUATION SPRING 2008

### PhD Graduates

**Jesse Angle** *Gamma Background Studies for the Xenon Experiment Using a High-Purity Germanium Detector* **Laura Baudis**, chair

**Wei Chen** *Disorder and Correlations in Metallic Cuprates* **Peter Hirschfeld**, chair  
Out of several postdoc offers Wei chose one at the University of New South Wales in Sydney, Australia, where he is headed in August.

**Tara Dhakal** *Manipulating the Magnetic Domains of Hole-Doped Manganites by Using Electric Field* **Amlan Biswas**, chair

**Brian Lane** *Conductances in the Two-Impurity Anderson Model*  
**Kevin Ingersent**, chair

**Naveen Margankunte** *Infrared Spectroscopy of Complex Oxides of Phase Separated Manganites and Electron Doped Cuprates*  
**David Tanner**, chair

**Sinan Selcuk** *Optical Studies of Subwavelength Structures* **Arthur Hebard**, chair

**Xiaoming Wang** *Ultrafast Optical Spectroscopic Study of Semiconductors in High Magnetic Fields* **David Reitze**, chair

**Glenn Watson** *Affine Quantization of Metric Variables* **John Klauder**, chair

The Department of Physics hosted a party in honor of those graduating this semester with the following award recipients also being recognized:



The Garrett Award was awarded to **Art Ianuzzi** who is a Junior Physics major. He has done Condensed Matter Experiment research in the labs of **Profs. Greg Stewart** and **Amlan Biswas**. Next year he will be the president of our Society of Physics Students and is going to start a new mentoring program for our majors. He has a 3.44 GPA.

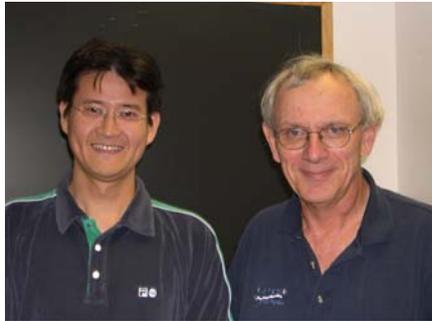
The Best Senior Thesis Award was awarded to **Brett Jackson**. This award is for the best senior thesis submitted by a Physics major. Brett has been doing research for almost 2 years with **Prof. Darin Acosta**. The title of his thesis is "Validation of the CMS Cathode Strip Track finder in the Magnet Test and Cosmic Challenge." He will be attending Physics graduate school at the University of Pennsylvania in the Fall.

The Sawyer Award was awarded to **Cameron Thacker** who is a Sophomore Physics major. He is starting research with **Prof. Peter Hirschfeld** in Condensed Matter Theory. This past year he has helped run the popular biweekly SPS cookie and coffee sale. Next year he will be the Vice President of SPS. He has a 3.78 GPA.

More graduation Photos on Page 4



**Congratulations Graduates!**



**Sung Soo Kim with advisor, Prof. Pierre Ramond**  
*Sung Soo will graduate in Summer 2008*



**Naveen Margankunte with advisor, Prof. David Tanner**



*A group photo of Physics Undergraduates who will be graduating this semester*

## Staff News



### Physics welcomes new Building Manager

The Physics Department welcomes Tim Noland (photo left), as newly hired Building Manager. Tim has worked for UF for 27 years and was previously employed at UF's Physical Plant as a maintenance specialist. Before coming to UF, he worked for Florida International University in Miami for 3 years. Tim is married and has 3 children. In 2005 he received the Superior Accomplishment Award for assisting in the Chocolate Exhibit at the Museum of Natural History. Please email Tim at [tnoland@phys.ufl.edu](mailto:tnoland@phys.ufl.edu) for issues related to the physics building.

### Physics Employees receive Years of Service pins at the College of Liberal Arts and Sciences Recognition Ceremony *All recipients are pictured with Interim Dean Joe Glover, photos courtesy Jane Dominguez*



**Victor Barashko**  
Coordinator  
Research  
Programs Services  
5 years



**Billie Hermansen**  
Office Assistant  
5 Years



**Jay Horton**  
Senior Engineering  
Technician  
5 Years



**Coralu Clements**  
QTP Senior  
Secretary  
10 Years



**Marc Link**  
Engineer  
Supervisor  
20 years