

PROTON



PHYSICS REPORT ON THINGS OF NOTE

VOLUME 6 NUMBER 2

FACULTY NEWS



Professor Ho Bun Chan receives CAREER Award

Professor Ho Bun Chan will receive a National Science Foundation Faculty Early Career Development (CAREER) Program Award. The CAREER award is the NSF's most prestigious honor for junior faculty

members. Ho Bun will receive \$500,000 over a five year period in support of his proposal "CAREER: Activated Escape in Nonequilibrium Micromechanical Oscillators - Research and Education Program " Congratulations Ho Bun!



Physicist appears on National Public Radio

Jacobo Konigsberg appeared live on National Public Radio's "Talk of the Nation Science Friday" to discuss high energy physics and the Tevatron particle accelerator at Fermilab. The hour long discussion

also included a scientist at CERN, looking to the startup of the Large Hadron Collider there later this year, and a scientist charged with helping to design the the next generation of high energy physics experiments in the form of the International Linear Collider.

The full article can be found at:
<http://tinyurl.com/27j6ug>

The archived audio can be found at:
<http://tinyurl.com/yslayj>

Recent Fermilab Discovery:

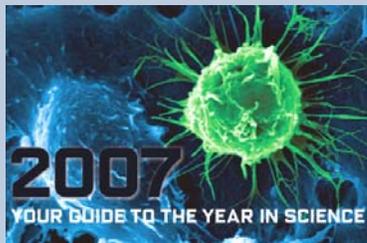
CDF precision measurement of W-boson mass suggests a lighter Higgs particle

Portions of the Fermilab Press Release can be read below. To View full Press Release Visit: http://www.fnal.gov/pub/presspass/press_releases/LighterHiggs.html

BATAVIA, Illinois - Scientists of the CDF collaboration at the Department of Energy's Fermi National Accelerator Laboratory announced January 8 the world's most precise measurement by a single experiment of the mass of the W boson, the carrier of the weak nuclear force and a key parameter of the Standard Model of particles and forces. The new W-mass value leads to an estimate for the mass of the yet-undiscovered Higgs boson that is lighter than previously predicted, in principle making observation of this elusive particle more likely by experiments at the Tevatron particle collider at Fermilab.

Scientists working at the Collider Detector at Fermilab measured the mass of the W boson to be $80,413 \pm 48 \text{ MeV}/c^2$, determining the particle's mass with a precision of 0.06 percent. Calculations based on the Standard Model intricately link the masses of the W boson and the top quark, a particle discovered at Fermilab in 1995, to the mass of the Higgs boson.

See CDF Page 2



Graphic Courtesy the Popular Science Website
<http://www.popsci.com>

Physics Professor contributes to "Popular Science" Magazine

The January 2007 issue of the magazine "Popular Science" featured an article, "2007: your guide to the year in science" in which they listed anticipated scientific breakthroughs for this year. Number one on that list was what they called "The answer machine", namely, the Large Hadron Collider at CERN. **Professor Konstantin Matchev** was interviewed for the accompanying article describing the LHC. In particular he is quoted as explaining how the LHC will discover extra spatial dimensions. The article is now available online at <http://tinyurl.com/ykbwd7>

Spring 2007 SEMINARS

Astrophysics
Fridays @ 4:00pm in Room 2165 NPB

Condensed Matter Physics
Mondays @ 4:05pm in Room 2165 NPB

High Energy Physics
Tuesdays @ 2:00pm and Fridays @ 12:40pm in Room 2165 NPB

Physics Colloquium
Thursdays @ 4:05 in Room 1002 NPB

Quantum Theory
Wednesdays @ 4:05pm in Room 2205 NPB

EDITORS
Alan Dorsey, Chair
Pam Marlin



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The Foundation for The Gator Nation



IFT Colloquium

The first IFT Colloquium of the Spring 2007 series is scheduled for Wednesday, February 14 at 4:05pm in 2165 NPB by **Professor Linda M. Bartoshuk**, a Member of the National Academy of Sciences. Linda will be speaking on 'Are you a supertaster? How do we know? What does it mean? (Some Demonstrations)' Some individuals (supertasters) are born with an unusually large number of taste buds. Supertasters live in a neon food world compared to the pastel food world of those with the fewest taste buds. The way foods taste affects our preferences for them and thus our diets. This affects risk factors for a variety of health problems (some cancers, cardiovascular disease, alcohol intake, smoking). We will conduct a test at the lecture to let you know if you are a supertaster. By the way, comparing taste experiences across individuals or groups is very difficult since we cannot share experiences directly. We will discuss the way psychologists try to solve this problem.

Congratulations!

Larry Phelps, Senior Engineer, is to receive a Division Three 2006-2007 Superior Accomplishment Award. Larry will receive a cash prize and will be recognized at an awards ceremony in February. His nomination will also move forward to be considered for a university-wide award. Congratulations Larry!

CDF Continued from Page 1

By measuring the W-boson and top-quark masses with ever greater precision, physicists can restrict the allowable mass range of the Higgs boson, the missing keystone of the Standard Model.

"This new precision determination of the W boson mass by CDF is one of the most challenging and most important measurements from the Tevatron," said Associate Director for High Energy Physics at DOE's Office of Science Dr. Robin Staffin. "Together, the W-boson and top-quark masses allow us to triangulate the location of the elusive Higgs boson." The CDF result is now the most precise single measurement to date of the W boson mass. Combining the CDF result with other measurements worldwide leads to an average value of the W-boson mass of $80,398 \pm 25 \text{ MeV}/c^2$.

Prior to the announcement of the CDF result, ALEPH, an experiment at CERN, the European Center for Nuclear Research, held the record for the most precise W mass measurement. ALEPH and its three sister experiments at CERN, which operated until 2001, made significant contributions to the measurement of the W's mass. The experiments relied on electron-positron collisions produced by the LEP collider at CERN. In contrast, CDF experimenters are analyzing proton-antiproton collisions produced by Fermilab's Tevatron, the world's most powerful particle collider.

"Compared to the electron-positron collisions at LEP, the proton-antiproton collisions at the Tevatron result in a 'dirty' environment experimentally," said **Jacobo Konigsberg**, University of Florida physicist and CDF spokesperson. "Every collision produces hundreds of particles along with the W boson that need to be properly accounted for. That's why our analysis is so challenging."

Also view article in the Chicago Sun Times
<http://www.suntimes.com/lifestyles/religion/202671,CST-NWS-god09.article>

UPCOMING SEMINAR SPEAKERS

FOR TIMES PLEASE SEE PAGE 1

ASTROPHYSICS

FEB 2, MARIA BABIUC, PITT
FEB 12, LUC BLANCHET, IAP
FEB 16, ODED REGEV, TECHNION
FEB 23, EVAN SCANNAPIECO, KITP

CONDENSED MATTER

FEB 12, DIRK MORR, UNIV OF CHICAGO
FEB 19, STEPHEN HAAS, UNIV OF S CALIF
FEB 26, JORIS VAN SLAGAREN, STUTTGART

HIGH ENERGY

FEB 2, C. THORN, PHYSICS, UF
FEB 6, J. PATERA, UNIV OF MONTREAL
FEB 9, B. KAYSER, FERMILAB
FEB 23, S. RABY, OHIO STATE

COLLOQUIUM

FEB 1, GREGORY HAMMETT, PRINCETON
FEB 8, MASSIMILIANO GALLEAZZI,
UNIV OF MIAMI
FEB 15, JOHN BEAMISH, UNIV OF ALBERTA
FEB 22, BORIS SHKLOVSKII, MINNESOTA

QUANTUM THEORY

FEB 7, VALERIA KLEIMAN, CHEMISTRY
FEB 14, SAM TRICKEY, QTP, UF

SEMINAR SCHEDULES ARE LISTED AT

[HTTP://WWW.PHYS.UFL.EDU/CALENDAR/SEMINARS.HTML](http://www.phys.ufl.edu/calendar/seminars.html)

2007



The 47th Annual Sanibel Symposium

will be held at The King and Prince Gold & Beach Resort on St. Simons Island, Georgia. It will be held from February 22—February 27, 2007.

For more information visit
<http://www.qtp.ufl.edu/~sanibel/>



STUDENT NEWS



U.F. Society of Physics Students

The Society of Physics Students chapter has been recognized as an Outstanding SPS Chapter by the national SPS organization. The selection is based on the depth and breadth of the SPS activities in areas such as physics research, public science outreach, physics tutoring programs, hosting physics meetings, and providing social events for members. Also recognized and congratulated are the SPS officers, and **Yoon Lee**, the SPS faculty advisor. Adding his congratulations to the SPS student recognition was **Professor James Dufty**, who recently submitted an NSF renewal proposal in which he mentions the success of the program. The UF Society of Physics Students website is located at <http://www.phys.ufl.edu/~sps/>



The Annual Alachua Region Science and Engineering Fair

is February 13, and your help is needed. Would you be willing to serve as a judge

Graphic is of the Alachua Region Science Fair Website
<http://tlc.sbac.edu/scifair/>

for the fair? There are over 260 projects in the Fair this year. This is a dramatic increase over last year and shows student's growing enthusiasm for science. The time commitment is from approximately 8:00am until 3:00pm on February 13, 2007.

This year's fair will be held at Santa Fe Community College. Judges are asked to check in by 8:00 A.M. After a short orientation, category judging will begin at 8:45am and end at 12:00 Noon. A working lunch will follow before the state science fair participants are selected in the afternoon.

Judges can register on-line at
<http://tlc.sbac.edu/scifair/>

If you have any questions or need any help, please contact Mary Jean Anderson at andersmj@sbac.edu



Deepak Kar, Physics Student, won honorable mention for his photo (right) titled, "Time Stands Still" in a photography contest organized by the UF International Centre. The photos can be viewed at <http://www.ufic.ufl.edu/photocontest06.htm>

Post Doc Position Available

There is an opening for a postdoctoral researcher, via a competitive, prestigious, named postdoctoral fellowship program. In particular, someone to lead a project that will use single-molecule transistors as a tunable model system to study quantum phase transitions. Related work would likely include extending single-molecule transistor measurements to high frequencies. A new experimental rig (a 12T variable temp. probe system) has been ordered and will be available for use, and there is ample theory support.

This opportunity comes about due to the recent establishment of the W.M. Keck Program in Quantum Materials (<http://keckmaterials.rice.edu>) at Rice. In this program, there will be ample opportunities for fruitful interactions with other investigators, all using tunable model systems (either nanostructures or cold atoms) to examine strong correlation physics.

Interested candidates should contact Professor Douglas Natelson at natelson@rice.edu

Minutes from the January 11 Graduate Student meeting have been posted at
http://www.phys.ufl.edu/grad_program/news/gradannouncements.html



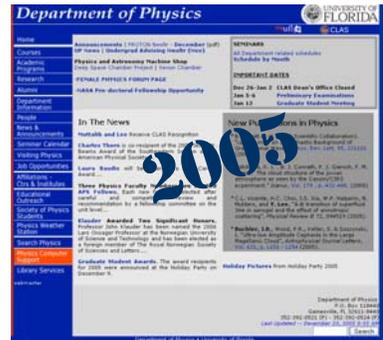
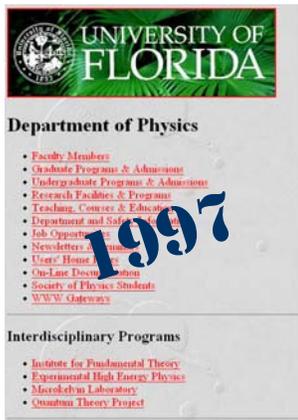


A LOOK AHEAD...

The Department of Physics will soon launch a newly redesigned departmental website.

For fun, here's a look back at other site designs used in previous years.

A LOOK BACK...



The PROTON is a monthly newsletter produced by the Physics Department to publicize the department's activities and news from the faculty and staff. Anyone is invited to submit material to be printed in the publication. Submissions for the PROTON should be sent to Pam Marlin, physicsnews@phys.ufl.edu by the 4th Monday of each month.