

PROTON



PHYSICS REPORT ON THINGS OF NOTE

VOLUME 6 NUMBER 4



Physics Faculty, Students, and Postdocs attend APS Meeting



The March meeting of the American Physical Society (APS) was held March 5-9, 2007 in Denver Colorado. In addition to the many contributed talks by our faculty, students and postdocs, several faculty gave invited talks to the meeting:

Prof Alan Dorsey, "Squeezing superfluid from a stone:

Coupling superfluidity and elasticity in a supersolid"

Prof Jim Duffy, "Nonequilibrium Statistical mechanics for Today's Graduate Students"

Prof Peter Hirschfeld, "Effect of strong correlations on transport properties of disordered cuprates" students Wei Chen and Lex Kemper, as well as postdoc Siegfried Graser, gave talks in related areas

Prof Adrian Roitberg, "QM/MM in complex systems using SCC-DFTB and its implementation in Amber"

Prof Yasu Takano, "Magnetic phase diagram of F₂PNNNO"

Prof Kevin Ingersent, Nasim Khoshkhou and Matthew Glossop, "Kondo Physics in a Dissipative Environment"

Matthew Glossop and Prof Kevin Ingersent, "Numerical Renormalization Group Study of a Dissipative Quantum Dot"

Brian Lane and Prof Kevin Ingersent, "Band filtering and quantum phase transition in an asymmetric double quantum dot,"

Dan Pajerowski, a second year graduate student working in Mark Meisel's group, presented a contributed oral talk entitled "Magnetism of Rubidium Cobalt Hexacyanoferrate Nanoparticles"

Kevin Little, an undergraduate at Taylor University in Indiana and a participant in the UF Physics REU Program during the summer of 2007 while working in the Meisel group, presented a contributed talk entitled "Magnetic Properties of Manganese(III) in Cluster-based Coordination Polymers"

Saritha Nellutla, a postdoctoral researcher at the NHMFL in Tallahassee, presented a contributed talk entitled "Thermomagnetic Studies of K₂NaCrO₈"

Work from the **UF Microkelvin Laboratory** was presented in a contributed talk entitled "Ultrasound Propagation in the Normal State of Liquid 3He/98% Aerogel"

Abstracts of talks can be found at <http://meetings.aps.org/Meeting/MAR07/Content/662>

A State of Florida Universities reception was also held on Tuesday, March 6, from 6-8 pm. The reception was well attended by faculty, students, alumni, and guests. In addition to the talks and reception there was a 20 year retrospective about the discovery of high-Tc superconductivity led by nobel prizewinner Georg Bednorz and also a rumor afoot that a group in Europe had built a 32-qubit functioning quantum computer.



Photos contributed by Physics student, Brian Lane. More photos can be viewed on page 4.

EDITORS

Alan Dorsey, Chair
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2007



47th Annual Sanibel Symposium

The 47th Sanibel Symposium was held at St. Simons Island Georgia from February 21 - 27, 2007. There were 245 participants showing up on site. For a list of speakers and abstracts please visit: <http://www.qtp.ufl.edu/sanibel>.



CCMS

Summer Lecture Series

It is our pleasure to announce the first Center for Condensed Matter Sciences (CCMS) Summer Lecture Series (SLS). The goal of the SLS is to provide interested students, postdocs and faculty with an in-depth look at frontier topics in Condensed Matter Physics. We hope that this informal, non-credit (ungraded) mini-course will be of intrinsic interest to many of you and inaugurate the first of many such programs.

CCMS Summer 2007 Lecture Series: "Fermi- and Non-Fermi Liquids"
July 9 - July 27 Monday, Wednesday, Friday in 90 minute lectures

This mini-course will familiarize the audience with the main concepts of the Fermi-liquid theory, as well as with several main mechanisms of its breakdown in one and higher dimensions. The theoretical concepts will be illustrated with abundant experimental data. The course will consist of ten 90-minute lectures. Further information will be provided as the date of the series approaches. If you have questions please contact **Dmitrii Maslov** maslov@phys.ufl.edu.

Special IFT Colloquium Seminar Speaker

On Wednesday, April 11, at 4:00 in 2165 NPB **L. Smolin** will be speaking on "Loop quantum gravity: basic results and present directions". Loop quantum gravity is the best studied background independent approach to quantum gravity. This means that it realizes fully the principle from classical general relativity that the equations of motion of the theory depend on no fixed classical geometry or fields and have no global symmetries. Loop quantum gravity is in fact the only quantization of general relativity and its extensions known to be rigorously well defined and consistent. I introduce the basic physical assumptions of this approach and explain how they lead to the main results which are known about the theory. Then I describe recent work applying the framework to cosmology, black holes, and high energy astrophysical observations that are sensitive to possible violations or modifications of special relativity due to quantum gravity effects.

UPCOMING SEMINAR SPEAKERS

FOR TIMES PLEASE SEE PAGE 1

ASTROPHYSICS

APR 9, ADRIAN MELOTT, KANSAS
(12:40PM)

CONDENSED MATTER

APR 2, PETER WOELFLE, KARLSRUHE
APR 9, SERGEI SHABANOV, UF
APR 16, RUSSELL BOWERS, UF
APR 23, MARK DYKMAN, MICHIGAN STATE

HIGH ENERGY

APR 3, CHARLES SOMMERFIELD, UF
APR 6, KANOKKUAN CHAICHERDSAKUL,
U OF TEXAS
APR 10, LEE SMOLIN, PERIMETER INST
APR 13, G. ROSS, OXFORD
APR 17, G. ROSS, OXFORD
APR 20, J. SCHECHTER, SYRACUSE
APR 24, CHRIS HAYS, OXFORD
APR 27, ZVI BERN, UC LOS ANGELES

COLLOQUIUM

APR 5, JOHN REYNOLDS, UF
APR 12, ADRIAN MELOTT, KANSAS
APR 19, HAROLD BARANGER, DUKE

QUANTUM THEORY

APR 4, TAREK SAAB, UF PHYSICS
APR 11, STEPHEN HAGEN, UF PHYSICS
APR 18, XUE LI, UF QTP
APR 25, STEVE RICHARDSON, HOWARD U

SEMINAR SCHEDULES ARE LISTED AT
<http://www.phys.ufl.edu/calendar/>

News Bits

Stephen Hill organized an invited symposium (sponsored by GMAG) entitled, '*Magnetic Bose-Einstein Condensation*'. This symposium brought together five invited speakers, including UF's Yasu Takano, who have been working on some of the most recent examples of materials displaying possible magnetic Bose-Einstein condensate phases. The title of Yasu's talk was '*Magnetic phase diagram of F_2PNNNO* '. The other speakers included: Ian Fisher (Stanford), '*High field behavior of the spin-dimer compound $BaCuSi_2O_6$* '; Cristian Batista (MST, Los Alamos), '*Dimensional Reduction at a Quantum Critical Point*'; Vivian Zapf (NHMFL, LANL), '*Quantum Magnetism and possible BEC in an organic Nickel compound*'; and Matthew Stone (ORNL), '*Quasiparticle condensation and breakdown in a quantum spin liquid*'. All of the talks featured recent high impact research which has been published in journals such as Nature and Physical Review Letters. The symposium (P4) took place in March.



Recently featured on the front of *Science* magazine is the large disk of muon chambers, where the University of Florida team led the design and construction, as it is being lowered into the cavern of the CMS experiment.

<http://www.sciencemag.org/content/vol315/issue5819/cover.dtl>

COVER Part of the cylindrical Compact Muon Solenoid particle detector descends to a hall 100 meters underground at the European particle physics laboratory CERN. The detector will capture the hail of particles produced when CERN's Large Hadron Collider smashes protons at unprecedented energies. A special News report beginning on page <http://www.sciencemag.org/cgi/content/short/315/5819/1652> profiles the new collider.



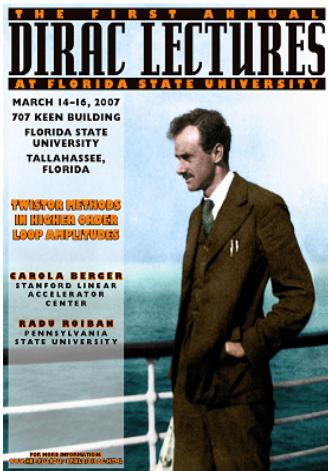
STUDENT NEWS



Photo of recognition ceremony, Shun-Pei Miao is located center

Shun-Pei Miao, graduate student, (*Advisor, Richard Woodard*) is recognized for being a finalist in this year's competition for the Madelyn Lockhart Dissertation Fellowship. The ceremony was held Monday evening, March 26, at the President's House. Shun-Pei's dissertation is entitled, "The Fermion Self-Energy during Inflation," and she will defend it at

11:00am on Tuesday, April 24. This fall she will start a 2-3 year postdoc at the University of Utrecht in The Netherlands. Her long-term goal is to take a faculty position in her home country of Taiwan.



Sung-Soo Kim, Jian Qiu, Patrick Hearin, and Jesus Escobar attended the first annual Dirac Lectures at Florida State University March 14-16. The topic was 'Twistors and Twistor Methods in Higher Order Loop Amplitudes'
<http://www.hep.fsu.edu/~bfield/dirac.html>

The poster of the workshop can be found at
http://www.hep.fsu.edu/~bfield/Dirac_Lectures_2007_Poster.pdf.



In February, **Daniel Sindhikara** was awarded the Chemical Physics Center Travel Award for Graduate Students" for conference expenses. The grant was used

for a trip to the Sanibel Symposium at St. Simon's Island, Georgia where Daniel presented a poster on his research. The award was in the amount of \$150.

Daniel also received the NSF EAPSI (Eastern Asian and Pacific Summer Institute) Fellowship for the summer of 2007 for study in Japan. This fellowship provides opportunities for graduate students seeking to make international contacts. As part of the program, he will be attending an orientation in Washington DC, April 1st-3rd, another in Tokyo, June 12-19th, then staying at the host institution, Nagoya University, in Nagoya, Japan, through August 23rd. At the host institution, he will be working with molecular simulation expert, Professor Yuko Okamoto.

In addition, Daniel will receive a 2006-2007 Graduate Student Teaching Award. He will be presented with his award on Thursday, April 26, at 3:30 pm in the Friends of Music Room in the University Auditorium.

Student Awarded Prestigious Goldwater Scholarship



Bradford Barker, a junior physics and mathematics major, has been selected as one of 317 Goldwater Scholars in the nation. The award is for the most outstanding students in math, science, and engineering in the country and is open to sophomores and juniors. Each university in the country is able to nominate up to four students, and each community college is able to nominate up to two. Besides Brad, Ed Miller (physics and chemistry), and Dustin McLarty (aerospace engineering) won the award. The fourth nominee, Gloria Tavera (cognitive science), won an honorable mention. Last year, UF also produced three winners and one honorable mention. One of the winners last year, Don Burnette, is a physics/mathematics/electrical engineering triple major. The scholarship provides up to \$7500 a year for the number of remaining academic years that student has left, which, in Brad's case, is just one.



The Barry M. Goldwater Scholarship and Excellence in Education Program was established by Congress in 1986 to honor Senator Barry M. Goldwater, who served his country for 56 years as a soldier and statesman, including 30 years of service in the U.S. Senate. The purpose of the Foundation is to provide a continuing source of highly qualified scientists, mathematicians, and engineers by awarding scholarships to college students who intend to pursue careers in these fields. For more information about the scholarship, the official website is
<http://www.act.org/goldwater/>.



Recent Publications

M. T. Glossop and K. Ingersent, Kondo physics and dissipation: A numerical renormalization-group approach to Bose-Fermi Kondo models, Phys. Rev. B. 75, 104410 (2007), 23 pages.

Thanks to Brian Lane who contributed the photos of the APS meeting in Denver and his visit to Utah. More photos of the trip can be viewed at <http://picasaweb.google.com/brianlane723/MarchMeeting07>

