PHYSICS DEPARTMENT NEWSLETTER

(http://physics.montana.edu)

Volume 12, No. 4
January 2005

Inside this issue:

PHYSICS NEWSLETTER
Compiled by: Rose Waldon

Contributors: Faculty, Students, Staff, and Alumni

Comments and Requests should be directed to:
E-mail: waldon@physics.montana.edu

Mail: Rose Waldon, Physics Dept., MSU Box 173840, Bozeman, MT 59717-3840

GENERAL NEWS:

The SSEL small satellite lab traveled to Reno, NV, Jan. 9th, for an Air Force Research Lab/NASA Goddard University Nanosat Flight Competition Review for the Maia satellite. Dave Klumpar, Brian Larsen, and 5 undergraduate engineering students traveled and presented at the review along with 11 other universities.

Jason Scott completed his undergraduate course work in December and submitted an honors thesis "Multi-Instrument Analysis of Coronal Structures", by J. Scott, J.W. Cirtain, and P.C.H. Martens, that will be submitted as a paper to the Astrophysical Journal.

* * * * *

Recently NASA has begun the transformation of its Earth and space science programs by combining them into an integrated Science Mission Directorate. The new Directorate will be closely involved in the Vision for Space Exploration through its support of science that both enables, and is enabled by, NASA's exploration activities.

The Solar Group has contributed two “white papers” NASA Science Mission Directorate Road Map Committees:

"Long-term Solar Variability and its Influence on Space and Global Climate and Evolution of Life on Earth: A Vision for Interdisciplinary Space Exploration", D. Nandi, P. Martens, L. Acton, and J. Priscu.

"RAM: Reconnection and Micro-scale Solar-Teerestrial Probe", Leon Golub, Ed Deluca, Piet Martens, and Spiro Antiochos

* * * * *

Niklas Chrsitensson (visitor from Lund Institute of Technology, Sweden) completed his Masters Thesis "Quantum interference in organic solid" and returned to Lund, Sweden.

HONORS, AWARDS AND NEW POSITIONS

Bill Hiscock has been re-appointed as Montana's state Delegate to the Aerospace States Association by Lt. Governor Bohlinger.

Jeannie Gunderson has accepted a position as Fiscal and Operations Manager in the Physics department. Congratulations Jeannie!

Dana Longcope has agreed to be the advisor to the Society of Physics Students (SPS) in the department.

NEW FACES IN THE DEPARMTNET

New graduate student Sabrina Savage comes to us from the University of Wyoming at Laramie. Sabrina’s interests are in Astrophysics.

Erwan Monot is visiting the MSU Physics Department from January – August on an exchange program between MSU and the University of Lyon I in Lyon, France. Erwan is a graduate student in general engineering at Ecole Centrale de Lyon. Erwan grew up in Paris and earned a Bachelors Degree in Electronics from Paris XI University in Orsay. He is studying physics to expand his background for work in nanotechnology and microelectronics. Erwan has broad interests including snow boarding, tennis, and rugby. The exchange program was organized by Rufus Cone and Bernard Jacquier with the MSU Office of International Programs. The current director in France is Professor Jean-Claude Gacon at the Laboratoire de Physico-Chimie des Matériaux Luminescents, Université Claude-Bernard Lyon 1. Gacon has visited MSU several times, has collaborated on two-photon absorption experiments, and will come for several weeks in August 2005.

If any MSU physics students are interested in a semester or a year in Lyon, see Rufus Cone for details of the program.

Andres Munoz, a non-degree graduate student arrived from Colombia in January, and has joined the Solar Group working with Piet Martens while he applies to the MSU graduate program.

PUBLICATIONS SUBMITTED

"*Atomistic modeling of Ag deposition on the low index faces of Al and Al deposition on Ag*", G. Bozzolo, J.E. Garces, and R.J. Smith, submitted to Surface Sciene, Jan 2005

``*Spatial Relationship Between Twist in Active Region Magnetic Fields and Solar Flares",* Hahn, M., Gaard, S., Jibben, P., Canfield, R.C., and Nandy, D., Astrophysical Journal, submitted, 2004.

"Narrow-band EUV multilayer coating for the MOSES sounding rocket," by Scott M. Owens, Jeffery S. Gum, Charles Tarrio, Joseph Dvorak, Benjawan Kjornrattanawanich, Ritva Keski-Kuha, Roger J. Thomas, and Charles C. Kankelborg, SPIE 50th annual meeting in San Diego.

"The TRACE Telescope Point Spread Function for the 171 Filter", S. Gburek, J. Sylwester, and P.C.H. Martens, submitted to Solar Phys.

PUBLICATIONS ACCEPTED

"Bulk magnetic properties of La(1-x)Ca(x)MnO3 (0=<x=<0.14):signatures of local ferromagnetic

order", Hirotoshi Terashita and J.J.Neumeier, Phys. Rev. B.

"Quantum fields and 'Big Rip' expansion singularities", Hector Calderon and William A. Hiscock, accepted for publication in Classical and Quantum Gravity (Letters).

PUBLISHED

"Giant dielectric permittivity of electron-doped manganite thin films, Ca1 - xLaxMnO3 (0 ≤ x ≤ 0.03)", J. L. Cohn, M. Peterca, and J. J. Neumeier, J. Appl. Phys. 97 , 034102 (2005)

"*Quantum fields and 'Big Rip' expansion singularities"*, Hector Calderon and William A. Hiscock, Classical and Quantum Gravity (Letters) 22, L23-L26 (2005).

"The Virtual Solar Observatory: Status and Initial Operational Experience", Frank Hill, Richard S. Bogart, Alisdair Davey, George Dimitoglou, Joseph B. Gurman, Joseph A. Hourcle, Petrus C. Martens, Igor Suarez-Sola, Karen Tian, Steven Wampler, and Keiji Yoshimura, Proceedings of the SPIE, Vol. 5493, pp. 163-169.

PROPOSALS SUBMITTED

"Using Metallic Interlayers to Stabilize Metal-Metal interfaces", NSF, $476,534, Dick Smith.

"What is the Topology of Magnetic Reconnection in Solar Flares?", NASA Graduate Student Research Program proposal, $24,000. Angela DesJardins, Richard Canfield (PI).

"Multi-instrument analysis of the physical and dynamic characteristics of solar coronal active regions", NASA Graduate Student Research Program, $ 72,000 Jason Scott, Piet Martens (PI).

"The Maia Nanosatellite for Science, Engineering, and Technology at Montana State University", AFOSR, $55,000, Dave Klumpar (PI), Bill Hiscock and Brian Larsen (Co-PI).

PROPOSALS FUNDED

"Montana Space Grant Consortium Aerospace Workforce Development", NASA, $ 100,000, William A. Hiscock, 2005.

"National Space Grant Student Mission to Mars -- MIMIC", NASA, $ 20,000, William A. Hiscock, 2005.

"Space Environmental Effects on the International Space Station: Assessment of Materials Degradation on the Materials International Space Station Experiment – 1 and 2 (MISSE-1 and 2)", NASA, $10,000, Donna J. Garton Minton, 2005-6.

"Building FIRST Robotics in Montana", NASA, $300,000, William A. Hiscock, 2005-2007.

INVITED and CONTRIBUTED TALKS

"XAS Characterization of cobalt-doped oxides", A. Lussier, Y.U. Idzerda, Montana State University; S.R. Shinde, S.B. Ogale, T. Venkatesan, University of Maryland, PCSI 32 in Bozeman, MT, Jan 23-27.

"Preparing the MOSES instrument for suborbital flight", Charles Kankelborg,OpTeC Seminar, MSU Bozeman, Jan. 31.

"Probing Student Understanding of Standing Sound Waves", Jack Dostal, AAPT meeting, Albuquerque, NM, Jan 8-12.

"1-2-3 photon spectroscopy of NLO chromophores", Aleks Rebane, 35th Winter Colloquium on The Physics of Quantum Electronics, Snowbird, UT, Jan. 2 -6.

"Targeted two-photon photodynamic therapy for the treatment of subcutaneous tumors", C. W. Spangler, MPA Technologies, Inc.; J. Starkey, Montana State Univ.; F. Meng, A. Gong, MPA Technologies, Inc.; M. Drobizhev, A. Rebane, Montana State Univ., SPIE Photonics West Meeting, San Jose, CA, Jan. 22-27.

POSTER PRESENTATIONS

"Strain and Interfacial Effects in Colossal Magnetoresistant Think Frims", J. Dvorak, 32nd Conference on the Physics & Chemistry of Semiconductor Interfaces conference, Bozeman, MT, Jan. 23-27.

"Effects of Stress on $LaxSr_{(1-x)}TM_3O_4$ Thin Films", Y. Idzerda, 32nd Conference on the Physics & Chemistry of Semiconductor Interfaces conference, Bozeman, MT, Jan. 23-27.

"XAS, XAFS, and VSM Characterization of cobalt-doped oxides", A. Lussier, 32nd Conference on the Physics & Chemistry of Semiconductor Interfaces conference, Bozeman, MT, Jan. 23-27.

"The Role of Interfacial Roughness on Spin Transport Properties of EuO Films", E. Negusse, 32nd Conference on the Physics & Chemistry of Semiconductor Interfaces conference, Bozeman, MT, Jan. 23-27.

"Conduction band states in Gallium materials", G.J. Lapeyre, 32nd Conference on the Physics & Chemistry of Semiconductor Interfaces conference, Bozeman, MT, Jan. 23-27.

"An Hour in the Life of Coronal Loops", J.W. Cirtain, J.T. Scott, P.C.H. Martens, H.D. Winter, AAS San Diego Meeting, Jan. 9-13.

COLLOQUIA

"Measuring length changes with sub-atomic resolution for the study of phase transitions in novel materials", John Neumeier, MSU Physics, Jan. 14.

"The Physics Behind Noninvasive Imaging of the Living Human Brain", Dr. Armin Fuchs, Center for Complex Systems and Department of Physics, Florida Atlantic University, Jan. 21.

“The Solar Dynamics Observatory: Science Goals and Technology Development”, Piet Martens, MSU Physics, Jan. 28.

SEMINARS

Condensed Matter Seminar

“Magnetic Susceptibility Arising from Self Damage in -Plutonium: A path to localization?” Scott McCall, Lawrence Livermore National Laboratory, Jan. 31.

Relativity-Astrophysics Seminar

"A Hierarchical Method of LISA Source Detection", Ronald W. Hellings, Jan. 26.

Solar

"The Solar Dynamics Observatory: Science Goals and Technology
Development", Piet Martens, Jan. 28.

TRAVEL

Aleks Rebane was a speaker at the 35th Winter Colloquium on The Physics of Quantum Electronics (PQE ’05) which was held in Snowbird, UT, Jan. 2-5.

Jack Dostal, Greg Francis, Bill Hiscock, and Larry Kirkpatrick attended the AAPT Winter Meeting held in Albuquerque, NM, Jan. 8-16.

Piet Martens participated in APJ Letters Editor’s Meeting held in conduction with the AAAS meeting in San Diego, CA, Jan. 10-12.

Jonathan Cirtain attended an AAAS meeting in San Diego, CA, Jan. 8-12.

Dave Klumpar, Sean Kirn, Brian Larsen, Alex Woidtke, John Friedrich, Calvin Coopmans, and Chad Bohannan traveled to Reno, NV, to attend the Air Force Research Labs University Nanosatellite Final Competition Review, Jan. 7-10.

Dave Klumpar participated in MINIS Balloon Campaign in Churchill, Manitoba, Jan. 11-30.

Loren Acton travelled to San Antonio, TX, Jan 11-12, to serve on the
NASA Science and Technology Definition Team for the Solar Probe mission.

Dick Canfield attended the AAS meeting in San Diego, January 10-13, and co-presented the poster:

Jo Dvorak came to MSU to conduct research with the Idzerda group and prepare for the 3 year SAC review, and attend the PSCI Conference held in Bozeman, Jan. 16-27.

Johnathon Holroyd attended the PSCI Conference and conducted research with the Idzerda Group, Jan. 17-28.

Recep Avci attended an ONR Coatings Workshop held in Sedona, AZ, Jan. 19-22.

Hugo Schmidt and Jiaping Han traveled to Richland, WA, for consultation with Larry Pedersen of PNNL, Jan. 20-24.

Aleks Rebane attended the SPIE Photonics West Conference in San Jose, CA, Jan. 21-26.

Alan Craig attended and gave a presentation at Photonics West sponsored by the Society of Photographic Instrumentation Engineers, held in San Jose, CA. Jan. 23-27.

Dana Longcope attended the NASA High Resolution Magnetic Imagery Instrument Workshop held in Palo Alto, CA., Jan. 26-27.

UPCOMING EVENTS

The Astro Fair, Montana’s biggest amateur astronomy event will be held on Saturday, February 26, from noon to 5 p.m. at the Museum of the Rockies. A free evening star party begins at 8 p.m., weather permitting. It is co-sponsored by the Southwest Montana Astronomical Society, and will include planetarium shows, telescope workshops, guest speakers, solar observing, demonstrations on the International Space Station, plus special activities for children and families. There is an admissions fee.