



PHYSICS DEPARTMENT NEWSLETTER

(<http://physics.montana.edu>)

Volume 12, No. 3
November/December 2004

Inside this issue:

<i>General News</i>	1
<i>PhD Thesis Defense</i>	1
<i>Publications</i>	
<i>Submitted</i>	2
<i>Accepted</i>	2
<i>Publications</i>	2
<i>Proposals Submitted</i>	2
<i>Invited and</i>	
<i>Contributed Talks</i>	2
<i>Poster Presentations</i>	3
<i>Outreach</i>	3
<i>Colloquia</i>	3
<i>Seminars</i>	3
<i>Travel</i>	3

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](mailto:waldon@physics.montana.edu)

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

GENERAL NEWS:

Dick Smith completed the Seattle Marathon on Nov 29, 2004. Congratulations on your accomplishment!

The Virtual Solar Observatory development team announced the release of version 1.0 of the VSO: 'Virtual Solar Observatory now available for "one-stop data shopping" (<http://www.sunspot.noao.edu/press/vso.html>).

New addition to the family.



Neil and Jamie Cornish receive an early Christmas present this year.

Eleanor Patricia Cornish arrived at 6:08 pm on Christmas eve. "Ellie" weighing in at 7lb 4oz. Neil reported that "everyone is doing great. Ellie is an eating and sleeping machine..... I hope everyone had a great Christmas, we certainly won't forget this one."

PH.D. THESIS DEFENSE

"Relativistic Accretion Flows onto Supermassive Black Holes: Shock Formation and Iron Fluorescent Emission Lines in Active Galactic Nuclei", Keigo Fukumura, Nov. 22.

PUBLICATIONS SUBMITTED

"*Negative thermal expansion of MgB₂ below T_c - violation of the Ehrenfest relation*", J. J. Neumeier, T. Tomita, J. S. Schilling, A. Serquis, V. F. Nesterenko, and S. S. Indrakanti, submitted to Physical Review Letters.

"*Quantum fields and "Big Rip" expansion singularities*", Hector Calderon and William A. Hiscock, submitted to Classical and Quantum Gravity (Letters).

"*A new method for analyzing second-order phase transitions applied to the ferromagnetic transition of a polaronic system*", J. A. Souza, Y.-K. Yu, J. J. Neumeier, H. Terashita, and R. F. Jardim, submitted to Physical Review Letters.

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

"*The Postflare Unresolved EUV Corona*", J.W. Cortain, P.C.H. Martens, and L.W. Acton, resubmitted to ApJ.

PUBLICATIONS ACCEPTED

"*Correlation between growth conditions, microstructure, and optical properties in pulsed-laser deposited V₂O₅ thin films*", C.V. Ramana, R.J. Smith, and C.M. Julien, Surface Science / Ion Beam Laboratory, Department of Physics, Montana State University, Bozeman, MT 59717, USA, Accepted for publication in Chemistry of Materials.

PUBLISHED

"*Phase stability after an electric-field poling in Pb(Mg_{1/3}Nb_{2/3})_{1-x}Ti_xO₃ crystals*", C.-S. Tu, R.R. Chien, F.-T. Wang V.H. Schmidt, and P. Han, Phys. Rev. B 70, 220103(R) (2004).

"*Magnetic, thermal, and electrical properties of La_{1-x}CaxCrO₃ (0 ≤ x ≤ 0.5)*", J. J. Neumeier and H. Terashita, Physical Review B 70 (2004) 214435.

"*Low-temperature permittivity of insulating perovskite manganites*", J. L. Cohn, M. Peterca, and J. J. Neumeier, Physical Review B 70 (2004) 214433.

"*The Virtual Solar Observatory: status and initial operational experience*", 2004, Hill, Frank; Bogart, Richard S.; Davey, Alisdair; Dimitoglou,

George; Gurman, Joseph B.; Hourcle, Joseph A.; Martens, Petrus C.; Suarez-Sola, Igor; Tian, Karen; Wampler, Steven; Yoshimura, Keiji, Proceedings of the SPIE, Volume 5493, pp. 163-169.

PROPOSALS SUBMITTED

Growth and Physical Properties Measurements of Novel Condensed Matter Materials, NSF-Division of Materials Research, \$508,528, John J. Neumeier.

"Development and test of X-ray Optics for an Explorer Class Astrophysics Mission", NASA EPSCOR, \$ 39,488, Piet Martens, Loren Acton and Charles Kankelborg.

"Study of Cr Poisoning in SOFCs Using Ion Scattering and Impedance Spectroscopy" DOE Fossil Energy SECA (Solid State Energy Conversion Alliance) program pre-application, Dick Smith (PI) and Hugo Schmidt (Co-PI).

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

"Montana Space Grant Consortium", NASA, \$ 1,935,625 , William A. Hiscock, 2005-2009.

INVITED and CONTRIBUTED TALKS

"MOSES: status of the rocket payload, and new inversion techniques", Charles Kankelborg, Solar Orbiter Imager meeting at Mullard Space Science Laboratory, UK, Nov 3-4.

"Optical Dephasing in Rare-Earth Doped Disordered Materials", Roger Macfarlane, American Ceramic Society Meeting, Nov. 8-12.

"Structure and Thermal Stability of Thin Fe Films on Al(001) Surfaces with Ti Interlayers¹", Dick Smith, AVS 51st International Symposium in Anaheim, CA, Nov 14-19, 2004.

"Early Stages of Oxidation at 800°C for CrAlON Superlattice Coatings used to Improve Oxidation Resistance of Steel Plates for Applications as SOFC Interconnects", Dick Smith, AVS 51st International Symposium in Anaheim, CA, Nov 14-19, 2004.

"Normalized Differential Detection Using Smart Pixels with Smart Illumination", Daryn Benson, Student Research Talk, Dec. 17.

POSTER PRESENTATIONS

"Doing Science with the VSO: Signatures of CME Initiation", Davey, A. R.; Wills-Davey, M.; Gurman, J. B.; Bogart, R.; Tian, K. Q.; Martens, P.; Yoshimura, K.; Hill, F.; Suarez-Sola, I.; Hourcle, J.; Dimitoglou, G.; Wampler, S., Fall AGU, Dec. 2004.

"STEREO in the Virtual Solar Observatory Context", Hourcle, J. A.; Bogart, R.; Davey, A.; Gurman, J. B.; Hill, F.; Martens, P.; Suarez-Sola, I.; Tian, K.; Yoshimura, K., Fall AGU, Dec. 2004.

OUTREACH

"Exploring the Red Planet: Past, Present, and Future", Bill Hiscock, Daedalians, Bozeman, MT, November 4.

"Exploring the Red Planet: Past, Present, and Future", Bill Hiscock, Montana Society of Engineers, Bozeman, MT, November 9.

COLLOQUIA

"A Walk in the Forest", Gary Strobel, MSU Department of Plant Sciences, Nov. 5.

"Cassini at Saturn: First results from the Cassini Plasma Spectrometer ", Dan Reisenfeld, University of Montana and the Cassini Plasma Spectrometer Team, Nov. 12.

"Perovskites", V. Hugo Schmidt, MSU Physics Department, Nov. 19.

"Captain Cook's Endeavour, a Twentieth Century Voyage on an Eighteenth Century Sailing Ship", Kenneth Younger, Medical Eye Specialists, Bozeman, MT, Dec. 3.

SEMINARS

Condensed Matter Seminar

"Cobalt site symmetry in doped magnetic oxides", Alex Lussier, Nov. 4.

"Characterization of the Surface Contribution to the Magnetic Anisotropy of Nanoparticles", Keith Gilmore, Nov. 4.

"Investigation of the role of roughness on spintronic properties of EuO using XRMS", Ezana Negusse, Nov. 4.

"Comparison of the EPR / ENDOR data for Fe³⁺ centers in LiNbO₃, LiTaO₃ and KTaO₃", Valentin Grachev, Nov. 18.

"Probing Interface disruption and magnetization dynamics with Soft X-rays", Yves Idzerda, Dec. 2.

"Ion beam analysis of low friction TiBC coatings", Asghar Kayani, Dec. 9.

Magnetism Seminar

"Diffraction Techniques", Adam McClure, Nov. 4.

"Polarized Neutron Reflectivity (PNR)", Ezana Negusse, Nov. 18.

"Rutherford Back Scattering (RBS)", Alex Lussier, Dec. 9

TRAVEL

Charles Kankelborg traveled to London, Ewhurst, Abingoon, UK, to attend the Solar Orbiter Meeting and Visit the Rutherford Appleton Lab, Nov. 1-7.

Alan Craig met with program managers in Washington, DC, and to Pittsburgh, PA, to deliver a seminar and discuss joint proposals, Nov. 1-7.

Bill Hiscock attended the 2004 Midwest Physics Chairs Meeting in Chicago, Nov. 7.

Dave Klumpar attended a NASA Advisory Subcommittee Meeting (SECAS) in Washington, DC, Nov. 2-5. He also participated in the NASA Sun-Solar Connections Roadmap Planning Workshop held Nov. 15-17 in Washington, DC.

Galina Malovichko attended an AAPT Workshop for new Physics faculty and an NSF Review Panel in Arlington, VA, Nov. 4-11.

Keith Gilmore, Johnathon Holroyd, Yves Idzerda, Michael Klem, Alex Lussier, Adam McClure, Ezana Negusse and Damon Resnick attended the 49th Conference on Magnetism and Magnetic Materials in Jacksonville, VL, Nov. 6-11.

Roger Macfarlane attended the American Ceramic Society meeting held in Cape Canaveral, FL, Nov. 8-12.

Recep Avci, William Glaspey, Gerald Lapeyre, Richard Smith, Zhiyong Suo, and Fernando Teran-Arce attended the American Vacuum Society Conference in Anaheim, CA, Nov. 11-19.

Asghar Kayani conducted Ion beam experiments on fuel cell samples at PNNL in Pasco, WA, Nov. 28-Dec. 5.

Yves Idzerda, Jerry Lapeyre, Keith Gilmore, Damon Resnick, Michael Klem and Mark Allen traveled to Berkeley, CA, to conduct experiments at the Advanced Light Source, Dec. 6-13.

Bill Hiscock traveled to Washington, DC, for a meeting of the EPSCoR Foundation Board of Directors and meetings at NASA Headquarters.

Ed Porter attended the Gravitational Waves Data Analysis Workshop held in Annecy, France, Dec. 7-10.

Dana Longcope, Richard Canfield and Trae Winter traveled to Sonoma, CA, to attend RHESSI/SOHO/TRACE Workshops, Dec. 7-12.

Dave Klumpar and Brian Larsen attended the American Geophysical Union/IMAGE meetings held in Oakland, CA, Dec. 8-17.

Ron Hellings traveled to Palo Alto, CA, to attend a LIST meeting and Texas Symposium, then on to Pasadena, CA, for collaboration with JPL personnel, Dec. 9-19.

Keiji Yoshimura attended an AGO meeting in San Francisco, CA, and TSO meeting in Stanford, CA, Dec. 13-17.

Piet Martens traveled to Cambridge, MA, to collaborate with Jonathan Cirtain, Dec. 6-12, then participated in a VSO meeting in San Francisco, CA, Dec. 14-17.