

Volume 15, No. 1

April – September 2008

Inside this issue:

<i>General News</i>	1
<i>Awards, Honors & New Positions</i>	5
<i>Thesis Defense</i>	6
<i>Publications</i>	
<i>Submitted</i>	6
<i>Published</i>	6
<i>Proposals Submitted</i>	7
<i>And Funded</i>	8
<i>Invited and</i>	8
<i>Contributed Talks</i>	9
<i>Poster Presentations</i>	10
<i>Travel</i>	10
<i>Outreach</i>	13
<i>Visitors</i>	13
<i>Alumni News</i>	13
<i>Physics News</i>	13

PHYSICS
 NEWSLETTER
 Compiled by:
 Sarah Barutha

Contributors:
 Faculty, Students,
 Staff, and Alumni

Comments and Requests
 should be directed to:

E-mail: sbarutha@physics.montana.edu

Mail: Sarah Barutha,
 Physics Dept., MSU
 Box 173840,
 Bozeman, MT 59717-3840

MSU satellite recommended for flight with NASA

A satellite made by Montana State University students to commemorate the 50th anniversary of the first U.S. satellite has moved another step closer to space. MSU's satellite, called "Explorer-1 Prime," (E1P) was one of three recommended to fly on a NASA rocket. The others were made at the University of Kentucky and the University of Colorado-Boulder. All the satellites are metal cubes measuring about four inches per side. That size, a standard adopted by several universities, allows the cubes to ride in an enclosed box that can be attached to a rocket. If NASA officials agree with the recommendation of a review panel that visited MSU in June, the MSU satellite will hitch a ride with a larger satellite and probably launch in mid-June from Vandenberg Air Force Base in California. This would also be the first time that NASA has agreed to carry a university satellite into space. A previous MSU satellite flew on a Russian rocket from Kazakhstan, but failed to reach orbit.



Here is the 2008 summer E1P crew. Twenty-two students and faculty to build one 10cm cube, and everyone was essential.



Welcome Grads 2008



Sean Brannon



Hans Courier



Paul Festler



Will Johnson



Jonathan Jorgensen



Wenjuan Liu



Gary Lowe



Laura Sampson



Roger Scott



Kathryn Williamson

GENERAL NEWS

HASP 2008 Flight

The High Altitude Student Platform (HASP) balloon was successfully launched from Fort Sumner, NM. One of the four large experiments onboard is the Montana Space Grant Consortium's BOREALIS cosmic dust capture experiment. The balloon is approximately 11 million cubic feet and has a 2,000 lb. payload. Congratulations to the BOREALIS HASP team, which is led by undergraduate students Jayson Nissen and Jenny Sue Hane with guidance from BOREALIS Flight Director Berk Knighton.

MSU Hosts International Workshop on Sun's Influence

Nearly 100 scientists from around the world gathered at MSU from June 1 – 6 to discuss the sun's influence on global climate. The workshop, "Solar Variability, Earth's Climate and the Space Environment," included directors of major international institutions, leaders of space missions and contributors to the report of the Intergovernmental Panel on Climate Change. The MSU organizing committee was headed by Dibyendu Nandi. Other members of the committee included Ravindra Belur, Wendy Chou, Lewis Fox, Silvina Guidoni, Bill Hiscock, Maria Kazachenko, Toni Lee, Dana Longcope, Anna Malanushenko, Piet Martens, David McKenzie (EPO Lead), Andres Munoz, Jiong Qiu, Lucas Tarr, and Keiji Yoshimura. This was the first workshop in this international series of meetings to be held in the United States. The primary focus of the workshop was understanding how variations in the sun's magnetic and radiative output influence our climate and space environment. This is important for protecting our technologies in space and on Earth. This understanding is also essential for distinguishing the natural and man-made causes of climate change. Sami Solanki, managing director of the Max-Planck-Institute for Solar System Research gave a public talk, "Global Climate Change: Is the Sun to Blame?"

Nobel Laureate John "Jan" Hall visits MSU

Nobel Laureate John L. "Jan" Hall visited the Physics Department September 3-6, 2008, sponsored by the Department of Physics, OpTeC, Spectrum Lab, Dean of Letters and Science, Vice President for Research, NSF EPSCoR, and Procrastinator Theater – ASMSU.

- Dr. Hall was awarded the 2005 Nobel Prize in Physics, sharing this honor with Theodor W. Hänsch of the Max-Planck-Institute (Garching, Germany) and Roy J. Glauber of Harvard University. Hall and Hänsch were recognized "for their contributions to the development of laser-based precision spectroscopy, particularly the optical frequency comb technique." Using the laser technique called "the optical frequency comb," scientists can rapidly measure the frequency of laser light sources with extraordinarily high precision. There are many implications for fundamental physics and international standards of measurement, and there are broader applications in Science, Metrology (the branch of science and technology that deals with accurate measurements of all types, international standards, and with the system of measurements) and, most recently, in Diagnostic Medicine.
- In addition to lab visits and discussions of research projects, Dr. Hall met students at all levels in SUB Ballroom D, offering students an informal opportunity to discuss life in science. The Optical Technology Center hosted informal discussions of optical and laser research at a reception on Thursday in SUB 235.
- In the Physics Colloquium, entitled "The Optical Frequency Comb - a remarkable tool for Metrology, Science, and Medical Diagnostics," Hall discussed the role precise measurements play in advancing science, technology and our ability to accurately tell time and tell where we are (via GPS). This was held in the new SUB Procrastinator Theater – the first ever lecture held in this facility. A reception was hosted by the College of Letters and Science and the Department of Physics.

MSU Solar Physics 2008 REU

Dario Passos, University of Algarve, “Exploring Maunder Minimum through stochastically forced dynamo simulations” (mentor: Dibyendu Nandi)
Keara Wright, University of Missouri – St. Louis, “Twist distribution in active region substructures” (Dick Canfield and Dibyendu Nandi)
Christopher Plumberg, Eastern University, “Working with FLUX: the FLUXON model” (Charles Kankelborg)
Krista White, Ball State University, “Extreme Ultraviolet Optics for Space Flight” (Kankelborg and Tom Rust)
Benjamin Cole, University of Dallas, “Langmuir probe measurements in the Ionosphere” (Dave Klumpar)
Eric Wolf, Michigan State University, “Modeling and measuring the flux and helicity ejected by the two ribbon flare” (Maria Kazachenko and Jiong Qiu)
Nicholas Hill, Grinnell College, “Helicity transfer and energy release in the Bastille Day solar flare” (Jiong Qiu and Maria Kazachenko)
Jacob Brown, Western Illinois University, “How do the components of the magnetic field of emerging active regions interact?” (Dana Longcope)
Jenna Gales, William Jewell College, “Supra-Arcade downflows” (Sabrina Savage and David McKenzie)



Top: Ben Cole and Nick Hill

Middle: Chris Plumberg, Dario Passos, Jacob Brown and Eric Wolf

Bottom: Krista White, Keara Wright and Jenna Gales

2008 Condensed Matter and LASER Physics REU/RET Presentations

Austin Stafford, Linfield College, McMinnville, OR (Advisor: Dr. Alan Craig)

Silicon Nanoparticle Mass by Milliken Oil Drop Experiment

Alyssa McComas, Transylvania University, Lexington, KY (Advisor: Dr. Richard Smith)

Effect of aluminum on oxidation resistance of Co/Mn thin films for SOFC interconnects

Christopher S. Wolfe, Southern Illinois University Carbondale (Advisor: Yves Idzerda)

Magnetic Anisotropy in Galfenol Thin Films

Brian Swarthout, Bozeman High School, Bozeman, MT (Advisor: Dr. Richard Smith)

Atomic Structure of Vanadium on Al(100) using RBS/c and LEED

Robbie Gill, Berry College, Mt. Berry, GA (Advisor: Hugo Schmidt)

Effects of Sintering Atmosphere on Solid Oxide Fuel Cell Electrolyte Material

Andrew Rice, Bethel University, MN (Advisors: Ariana de Campos and John Neumeier)

Electrical Resistivity Measurements of $\text{LaTiO}_{3.41}$ and $\text{SrNbO}_{3.41}$

Nathan Haydon, Montana State University, Bozeman, MT (Advisor: Dr. Randall Babbitt)

Decoherence

Max Lifson, Dartmouth College, Hanover, NH (Advisor: Dr. Stephen Sofie)

Effects of Nickel Oxide Sintering Aid in Micro and Nano Yttria Stabilized Zirconia Powders

Erich Beuerman, Montana State University (Advisor: Dr. Aleks Rebane)

Measurement of Solvatochromic Shifts of Rhodamine Dyes: Steps towards Improved Understanding of Two-Photon Absorption Properties

Optical Science & Engineering Conference

The Optical Science & Engineering Conference, sponsored by MSU Optical Technology Center, took place at the MSU Foundation & Alumni Center on August 27, 2008. It included oral presentations throughout the day and a poster session that evening. Department members were able to show off their prized Hawaiian shirts at the luau style reception.

Conference Organization

Rufus Cone is on the International Committee, for the Conference on Holeburning, Single Molecule, and Related Spectroscopies: Science and Applications 2009, Palm Cove, Australia, June 21 to 25, 2009.

AWARDS, HONORS, AND NEW POSITIONS

Spring Departmental Awards:

Outstanding Senior: Tyler Naibert and Michael Lenander

Outstanding GTA: Matt Adams, Jake Plovanic and Jeremy Wolf

Outstanding Staff: Norm Williams

Outstanding Faculty: Dana Longcope

Undergraduate Level Instructor Award (aka the UGLI award): Carla Riedel

Outstanding Graduate Level Instructor Award (aka OGLI award): Dana Longcope

Outstanding Undergraduate Award: Patrick Burr

Dick Smith was appointed as the Physics Department Head, effective August 1, 2008. He succeeds Bill Hiscock who remains in the department as a faculty member and Director of the Montana Space Grant Consortium.

Richard J Smith was named an AVS fellow.

Nikolay Makarov was awarded the 2008 D.J. Lovell Scholarship from SPIE. The D.J. Lovell scholarship is the society's largest and most prestigious award, and is awarded to students who show potential for long-range contribution to the fields of optics, photonics or related disciplines.

Keith Gilmore was awarded the 2008 Outstanding Doctoral Thesis Award by the Topical Group on Magnetism and its Applications (GMAG) of the American Physical Society.

PH.D. THESIS DEFENSE

Ijaz Zafarullah successfully defended his Ph.D. dissertation "Thulium Ions in a Yttrium Aluminum Garnet Host for Quantum Computing Applications: Material Analysis and Single Qubit Operations", on April 10; his advisor was Randy Babbitt.

Sytil Murphy successfully defended his Ph.D. dissertation "Anti-Stokes Generation in a Continuous-Wave Raman Laser", on July 7; her advisor was John Carlsten.

PUBLICATIONS SUBMITTED

"The Time History of Events and Macroscale Interactions during Substorms (THEMIS) Education and Outreach (E/PO) Program", L. M. Peticolas, N. Craig, S. F. Odenwald, A. Walker, C. T. Russell, V. Angelopoulos, C. Willard, M. B. Larson, W. A. Hiscock, J. M. Stoke, M. B. Moldwin, submitted to Space Science Reviews.

"Photon-Echo Quantum Memory", W. Tittel, M. Afzelius, R. L. Cone, T. Chanelière, S. Kröll, S. A. Moiseev, and M. Sellars, *Laser & Photonics Reviews*.

"Al-Fe interface intermixing and the role of Ti, V, and Zr as a stabilizing interlayer at the interface", W. Priyantha, H. Chen, M. Kopczyk, M. Lerch, C. Key, R. J. Smith, P. Nachimuthu, W. Jiang, submitted to *Journal of Applied Physics*.

PUBLICATIONS

Electrical transport in single-crystalline $\text{Li}_{0.9}\text{Mo}_6\text{O}_{17}$: A two-band Luttinger liquid exhibiting Bose metal behavior, C.A.M. dos Santos, M.S. da Luz, Y.-K. Yu, J.J. Neumeier, J. Moreno, and B.D. White, *Physical Review B* **77**, 193106 (2008).

Nanotwin and phase transformation in tetragonal $\text{Pb}(\text{Fe}_{1/2}\text{Nb}_{1/2})_{1-x}\text{Ti}_x\text{O}_3$ single crystal, C.-S. Tu, C.-T. Tseng, R. R. Chien, V. Hugo Schmidt, and C.-M. Hsieh, *Journal of Applied Physics* **104**, 054106/1-4 (2008).

Crystal growth and characterization of Marokite $\text{CaMn}_2\text{O}_{4+\delta}$, B.D. White, C.A.M. dos Santos, J.A. Souza, K.J. McClellan, and J.J. Neumeier, *Journal of Crystal Growth* **310**, 3325 (2008).

Quantum fields near phantom-energy "sudden" singularities, H. H. Calderon, *Physical Review D* Vol.78, No.4 (2008)

Controlled compositional disorder in $\text{Er}^{3+}:\text{Y}_2\text{SiO}_5$ for wide bandwidth hole burning material at 1.5 μm , Thomas Böttger, C. W. Thiel, R. L. Cone, and Y. Sun, *Physical Review B* **77**, 155125 (2008).

Magnetic signatures of ferromagnetic polarons in $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$: Colossal magnetoresistance is not a Griffiths singularity, J.A. Souza, J.J. Neumeier, and Y.-K. Yu, *Physical Review B* (2008).

Intermediate phases in rhombohedral $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})_{1-x}\text{Ti}_x\text{O}_3$ crystal, C.-S. Tu, H.-T. Chuang, S.-C. Lee, R. R. Chien, V. Hugo Schmidt, and H. Luo, *Journal of Applied Physics* **104**, 024110 (2008).

Blood-vessel closure using photosensitizers engineered for two-photon excitation, H. A. Collins, M. Khurana, E. H. Moriyama, A. Mariampillai, E. Dahlstedt, M. Balaz, M. K. Kuimova, D. Phillips, M. Drobizhev, A. Rebane, B. C. Wilson, and H. L. Anderson, *Nature Photonics* **2**, 420 - 424 (30 May 2008).

Two-photon absorption standards in the 550-1600 nm excitation wavelength range, N. S. Makarov, M. Drobizhev, A. Rebane, *Optics Express* **16** (6), pp. 4029-4047 (2008).

May Day! Coronal Loop Temperatures from the Hinode EUV Imaging Spectrometer, J.T. Schmelz, J. Scott, L.A. Rightmire, *The Astrophysical Journal*, Volume 684, Issue 2, pp. L115-L118 (9/2008).

Quantitative prediction of two-photon absorption cross section based on linear spectroscopic properties, A. Rebane, N. S. Makarov, M. Drobizhev, B. Spangler, E. S. Tarter, B. D. Reeves, Ch.W. Spangler, F. Meng, Z. Suo, *J. Phys. Chem. C* **112**, pp.7997-8004 (2008)

Two-photon absorption properties of meso-substituted A3-corroles, D.T Gryko, A. Rebane, M. Drobizhev, N. S. Makarov, B. Koszarna, M. Tasior, *Chem Phys Lett* v.462, Issue: 4-6, pp.246-250 (2008).

Thermal and chemical stability of epitaxial Fe films grown on the Ti-stabilized Al(100) surface, C. V. Ramana, W. Priyantha, and R. J. Smith, and Bum-Sik Choi, *Surface Science* **602** (2008) 534–544.

Advanced PVD Protective Coatings for SOFC Interconnects, P. Gannon, M.C. Deibert, V. Gorokhovskiy, P. White, R.J. Smith, H. Chen, J. Lucas, *International Journal of Hydrogen Energy*, **33** (2008) 3991 - 4000.

Simulated Solid Oxide Fuel Cell Interconnect Performance of Crofer 22 APS with and without Filtered Arc Cr-Al-O-N Coatings, P. Gannon, A. Kayani, C.V. Ramana, M.C. Deibert, R.J. Smith, V. Gorokhovskiy, *Electrochemical and Solid-State Letters*, **11**(4) B54-B58 (2008).

Thermal stability and oxidation resistance of TiCrAlYO coatings on SS430 for solid oxide fuel cell interconnect applications, H. Chen, J. A. Lucas, W. Priyantha, M. Kopczyk, R. J. Smith, K. Lund, C. Key, M. Finsterbusch, P. E. Gannon, M. Deibert, V. I. Gorokhovskiy, V. Shutthanandan, P. Nachimuthu, *Surface and Coatings Technology*, **202** (2008) 4820-4824.

PROPOSALS SUBMITTED

“Strongly Optically Coupled Quantum Solids, submitted to DARPA Quantum Entanglement Science and Technology (QUEST)”, May 2008, PI: Aleksander Rebane, Co-PI: Krishna Rupavatharam, Co-PI: Charles Thiel, for \$1,201,424.

“High-Resolution Wide-Bandwidth Optical Arbitrary Waveform Generation Over Extended Time Apertures”, submitted to DARPA SBIR (Phase I) program by S2 Corporation (with MSU as sub-contractor), June 2008, PI at S2 Corp: Peter Sellin, PI on MSU sub-contract: Charles Thiel, Status: Pending

“Searches for Transient Gravitational Wave Signals”, NSF, September 2008, PI: Neil Cornish, for \$302,246.

“DURIP: Interfacial Engineering of Multi-ferroic Multilayers by Pulsed Laser Deposition”, US Army Research Office, August 2008, PI: Yves Idzera, for \$146, 480.

“Expecting the Unexpected: LISA Data Analysis for Unknown Sources”, NASA, August 2008, PI: Ron Hellings, for \$365,591

“Miniaturized LADAR Sensor and Control Concepts for NanoSat Formation Flying”, National Reconnaissance Office as subcontract from Bridger Photonics, June 2008, PI: David Klumpar, Co-PI: Larry Springer, for \$78,880.

“CubeSat: Firebird: Focused Investigations of Relativistic Electron Burst Intensity, Range and Dynamics”, NSF, May 2008, PI: David Klumpar, for \$611,636.

“Flexible Tunable VHF/UHF CubeSat Transceiver Using an Advanced Single Chip Software Defined Ratio”, National Reconnaissance Office, June 2008, PI: Larry Springer, Co-PI: David Klumpar, for \$149,900.

“Gravitational Radiation from Intermediate Mass Black Hole Binaries”, NASA, May 2008, PI: Sachiko Tsuruta, for \$156,123.

“Characterizing ICME Structures and Exploring the Solar Origin of Magnetic Flux Ropes”, NASA, April 2008, PI: Jiong Qiu, for \$65,272.

“Advanced Multi-Photon Chromophores for Broad Band Ultra Fast Optical Limiting”, Air Force Office of Scientific Research, June 2008, PI: Aleksander Rebane, Co-PI: Mikhail Drobijev, for \$453, 638.

“Douglas Gale – From Router to Browser: The Transformation of the Internet”, NSF, August 2008, PI: Dick Smith, for \$126,730.

PROPOSALS FUNDED

“Building Better Probes for 2 Photon Microscopy”, NIH, PI: Mikhail Drobijev, Aleksander Rebane Co –PI, Thomas Hughes Co-PI, \$973,648; 2008-2012.

“Computing Device Applications of Group IV Nanoparticle Spectroscopy. US Dept of Defense, PI: Alan Craig, \$499,250, 2008-2011.

“Development of a Novel High Spectral Resolution Lidar for Studies of the Effects of Aerosols on the Earth’s Climate System”, NASA, PI: William Hiscock, Co-PI Kevin Repasky, \$750,000, 2008-2011.

“Characterization of Multi-Ferroic Interface Structures”, US Army Research Office, PI: Yves Idzerda, \$759,598, 2008-2011.

“Multi-frequency Spectroscopy of Rare Earth and Transition Ions in Optical Materials”, NSF, PI: Galina Malovichko, \$448,708, 2008-2011.

“Synchrotron Characterization of Interface related Performance Issues of LSCF Cathodes in SOFCs”, US Dept of Energy, PI: Yves Idzerda, Co-PI: Alex Lussier, \$279,289, 2008-2009.

“Interface Region Imaging Spectrograph (IRIS) Phase A Study”, Lockheed Martin, PI: Charles Kankelborg, Co-PI: Dave Klumpar and Larry Springer, \$119,311, 2008-2009.

INVITED TALKS

“Luttinger Liquid Behavior in a Quasi-One-Dimensional Transition Metal Oxide”, J.J. Neumeier, 10th Annual Meeting of the Northwest Section APS, Portland, Oregon, May 17, 2008.

“Solid Oxide Fuel Cells,” **R. R. Chien**, V. Hugo Schmidt, C.-L. Tsai, L. M. Lediaeve, N. P. Santorsola, and P. A. Burr, Department of Physics, Fu Jen Catholic University, Taipei, Taiwan, July 7, 17, 24, 2008.

CONTRIBUTED TALKS

Advances in LISA data analysis techniques and Characterizing the Gravitational Wave Signature from Cosmic String Cusps, N. Cornish and J. Key, given at the 7th International LISA Symposium in Barcelona, Spain, June 16-20, 2008.

A new quartz capacitance dilatometer for magnetostriction measurements, M.S. da Luz, D.P. Cebulla, and J.J. Neumeier, 10th Annual Meeting of the Northwest Section APS, Portland, Oregon, May 17, 2008.

Magnetocaloric Effect and Thermal Expansion in $Mn_{1-x}Fe_xAs$, A. de Campos, S. Gama, B. McGuire, and J.J. Neumeier, 10th Annual Meeting of the Northwest Section APS, Portland, Oregon, May 17, 2008.

Environment-sensitive two-photon dye, N.S. Makarov, E. Beuerman, M. Drobijev, J. Starkey, A. Rebane, MSU Optical Technology Center Annual Meeting, MSU, Bozeman, MT, August 27, 2008.

Solar Coronal Tomography, C. Kankelborg, MSU Optical Technology Center Annual Meeting, MSU, Bozeman, MT, August 27, 2008.

High-performance, micro-resolution FMCW LADAR, B.M. Taylor, T.J. Berg, R.R. Reibel, P.A. Roos, W.R. Babbitt, MSU Optical Technology Center Annual Meeting, MSU, Bozeman, MT, August 27, 2008.

Filtered arc and hybrid PVD materials for SOFC applications, P.E. Gannon (invited), M.C. Deibert, V. Gorokhovskiy, P. White, R.J. Smith, H. Chen, S.W. Sofie, International Conference on Metallurgical Coatings and Thin Films, San Diego, CA, May 1, 2008.

High temperature thermal stability of oxi-ceramic coatings deposited by large area filtered arc deposition, V.I. Gorokhovskiy, J. Wallace, P.E. Gannon, C. Bowman, B. Gleeson, R.J. Smith, H. Chen, M. Finsterbusch, International Conference on Metallurgical Coatings and Thin Films, San Diego, CA, May 1, 2008.

Ion beam analysis on Cr retention and oxidation resistance of coatings on SS430 interconnect for solid oxide fuel cells application, H. Chen, W. Priyantha, M. Kopczyk, R. J. Smith, C. Key, P. E. Gannon, V. I. Gorokhovskiy, M. Deibert, V. Shutthanandan, P. Nachimuthu, 20th International Conference on the Applications of Accelerators in Research and Industry, Ft. Worth, TX August 11-15, 2008.

High temperature thermal stability and oxidation resistance for magnetron-sputtered CrAlON coatings on 430 steel, A. Kayani, K. J. Wickey, M.I. Nandasiri, E. Garratt, A. Moore, J.F. Novak, R.J. Smith, T.L. Buchanan, W. Priyantha, M. Kopczyk, P.E. Gannon, V.I. Gorokhovskiy, 20th International Conference on the Applications of Accelerators in Research and Industry, Ft. Worth, TX August 11-15, 2008.

Teaching Ion Beam Analysis in the context of Solid Oxide Fuel Cell materials research, R.J. Smith, H. Chen, W. Priyantha, 20th International Conference on the Applications of Accelerators in Research and Industry, Ft. Worth, TX August 11-15, 2008.

Interface Mixing of Fe-Al Interface and role of Ti, V and Zr as a Stabilizing Interlayer at the Interface, W. Priyantha, H. Chen, M. Kopczyk, K. Lund, C. Key, R.J. Smith, P. Nachimuthu, V. Shutthanandan, 20th International Conference on the Applications of Accelerators in Research and Industry, Ft. Worth, TX August 11-15, 2008.

POSTER PRESENTATIONS

"Helium-flow Cryostat for Investigating Materials at Low Temperatures," Michael Leander, John Neumeier, 2008 MSU Student Research Celebration, April 15, 2008.

"Longitudinal Dynamics On Post-reconnected Thin Flux Tubes", Silvina Guidoni, Dana Longcope, Mark Linton, SPD & AGU Joint meeting, Fort Lauderdale, FL, May 27-30 and at "Solar Variability, Earth's Climate and the Space Environment" workshop, Montana State University Bozeman, MT, June 1 – 6, 2008.

"A Capacitance Dilatometer for Magnetostriction in $\text{Li}_{0.9}\text{Mo}_6\text{O}_{17}$," David Cebulla, Mario da Luz, John Neumeier, 2008 MSU Student Research Celebration, April 15, 2008.

"Critical Analysis of the Ferromagnetic Phase Transition in $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ Using High Temperature Thermal Expansion Data," B.A. McGuire, J.A. Souza, J.J. Neumeier, R.K. Bollinger, K. Lask, 2008 MSU Student Research Celebration, April 15, 2008.

"Linear Thermal Expansion Measurements with Sub-Atomic Resolution for the Study of Phase Transitions in Novel Condensed Matter Systems," John Neumeier, The Experimental Program to Stimulate Competitive Research (EPSCoR) Program Review, Oak Ridge National Laboratory, July 22-24, 2008.

"Measuring Stokes shifts in rhodamines: towards quantitative description of vibronic two-photon absorption", E. Beuerman, N.S. Makarov, M. Drobijev, A. Rebane, MSU Optical Technology Center Annual Meeting, MSU, Bozeman, MT, August 27, 2008.

"Developing fully automated small animal near-IR photodynamic therapy testbed", D. Coll Segarra, N.S. Makarov, J. Starkey, M. Drobijev, A. Rebane, MSU Optical Technology Center Annual Meeting, MSU, Bozeman, MT, August 27, 2008.

"Earthshine observation and measurement", Jiong Qiu, MSU Optical Technology Center Annual Meeting, MSU, Bozeman, MT, August 27, 2008.

Optical decoherence, spectral diffusion, and ^{169}Tm hyperfine structure of $\text{Tm}^{3+}:\text{LiNbO}_3$ at 794 nm for quantum computing and signal processing applications, C. W. Thiel, Y. Sun, T. Böttger, W. R. Babbitt, and R. L. Cone, MSU Optical Technology Center Annual Meeting, Montana State University, Bozeman, Montana, August 27, 2008.

Persistent spectral hole burning, spectral diffusion, and super-hyperfine interactions of $\text{Er}^{3+}:\text{LiNbO}_3$ at 1.5 μm for quantum computing and signal processing applications, C. W. Thiel, R. L. Cone, T. Böttger, Y. Sun, W. R. Babbitt, and K. D. Merkel, MSU Optical Technology Center Annual Meeting, Montana State University, Bozeman, Montana, August 27, 2008.

TRAVEL

Silvina Guidoni visited Mark Linton, at the Naval Research Laboratory (Washington, DC), to work on "Magnetic Reconnection". April 21 – 30, 2008. While she was there, she presented "Longitudinal Dynamics On Post-reconnected Thin Flux Tubes" to a group at the Naval Research Laboratory (Washington, DC). April 30, 2008.

John Neumeier, Mario da Luz, and Ariana de Campos traveled to Portland, Oregon for the 10th Annual Meeting of the Northwest Section APS between May 15-May 18, 2008.

Rick Bollinger traveled to Los Alamos National Laboratory to conduct experiments in May 2008.

John Neumeier traveled to Arlington, Virginia to conduct proposal reviews for the NSF between May 21-22, 2008.

Dave Klumpar participated in the Space Weather Week Workshop in Boulder, CO from April 28-May 2, 2008.

Larry Springer attended the CubeSat Workshop in San Luis Obispo, CA from April 8-April 13, 2008.

Aleks Rebane attended the DoD tri-service meeting at Head Island, SC from April 11-April 17, 2008.

John Carlsten attended the CLEO Conference in San Jose CA from May 3-May 9, 2008.

Yves Idzerda, Johnathon Holroyd, Vanessa Pool, Ariana de Campos, Mario da Luz, Mikhail Drobijev and Hector Calderon attended the 10th Annual Meeting Northwest Section – APS in Portland OR May 15-May 18, 2008. Hector Calderon presented his research results.

Larry Springer and Dave Klumpar attended the Small Payloads Rideshare Conference at Wallops Island, Chincoteague, VA from May 19-May 23, 2003.

MSU Physics Department was well represented at the Joint Assembly of AGU and SPD 2008 in Fort Lauderdale, FL from May 24 – May 31, 2008. Those attending the Joint Assembly were Anny Malanushenko, Tom Rust, Dana Longcope, Charles Kankelborg, Jiong Qiu, Lewis Fox and Andres Munoz.

Tyson Littenberg and Paul Baker collaborated with the University of Wisconsin Milwaukee Ligo Group in Milwaukee, WI from May 26-May 31, 2008.

Anny Malanushenko traveled to Boulder, CO to collaborate with HAO scientists from June 9-June 14, 2008.

Alex Lussier attended the Fuel Cell Science, Engineering and Technology Conference in Denver, CO from June 15-June 18, 2008.

Recep Avci and Zhiyong (Jahson) Suo presented at the International Scanning Probe Microscopy meeting in Seattle, WA from June 21-June 25, 2008.

Ravindra Belur participated in the SHINE 2008 meeting in Midway, Utah from June 22-27, 2008.

From June 15-June 30, 2008, Dave Klumpar attended the CEDAR meeting and CubeSat session plus the Geospace Environment Modeling session in Midway, UT. He then participated in the ESRA rocket competition judging in Green River UT.

Jiong Qiu traveled to Newark, NJ to collaborate with Professor Dale Gary from July 13-July 16, 2008.

Shannon Willoughby presented research results at the American Association of Physics Teachers Conference in Edmonton, Alberta, Canada from July 20-July 24, 2008.

John Neumeier participated in the Dept. of Energy EPSCoR program review at Oak Ridge, TN from July 21-July 26, 2008.

Dibyendu Nandi attended the NASA LWS Focus Team meeting in Boulder, CO from July 21-July 24, 2008.

Yves Idzerda attended the SECA grant award meeting at NETL in West Virginia from July 7-July 10, 2008.

Bill Hiscock attended the NM NASA EPSCoR TAC meeting as well as the Operationally Responsive Space meeting in Cloudcroft, NM from July 13-July 19, 2008.

Dave Klumpar attended the CubeSat Workshop, AIAA/USU Small Satellite Conference and the SpaceBuoy PQR in Logan, UT from August 9-August 14, 2008. Larry Springer also attended the Small Satellite Conference.

Aleks Rebane attended the 25th World Laboratory meeting in Erice, Italy from August 18-August 25, 2008.

Weerasinghe Priyantha and Hui Chen accompanied Dick Smith who presented papers at the 20th International Conference on Applications of Accelerators in Research & Industry in Fort Worth, TX from August 10-August 15, 2008. A session on "Ion Beam Analysis of Technologically Important Oxide Films" was organized by Dr. V. Shutthanandan from EMSL, with presentations by several of Dick's former students and postdocs, and dedicated to Dick on the occasion of his 60th birthday.

Hugo Schmidt, Ruth Chien, Galina Malovichko, and Valentin Grachov participated in the Workshop to Develop an EPSCoR Consortium in Fayetteville, AR from August 17-August 19, 2008.

Vanessa Pool and Johnathon Holroyd conducted experiments at ALS in California from August 19-August 25, 2008.

Ron Hellings collaborated with Shane Larson of Utah State University in Logan, UT from August 24-August 25, 2008.

David McKenzie attended the AMFFA meeting and Astronomy talk in West Yellowstone, MT from August 24-August 27, 2008.

Jayson Nissen, Jenny Sue Hane and Berk Knighton traveled to Fort Sumner NM for HASP launch from September 6-September 11, 2008.

Bennett Link attended a conference in Yerevan, Armenia from September 15-September 25, 2008.

Dick Smith presented papers at NW Chapter AVS meeting at Environmental and Molecular Sciences Lab in Richland, WA from September 18-September 19, 2008. Also attending the NW Chapter AVS meeting were Hui Chen, Nick Childs, Michael Kopczyk, Michael Lerch, and Camas Key. They presented two posters (W. Priyantha and M. Kopczyk) and a contributed oral talk (Hui Chen) at the meeting.

Angela Des Jardins and Glenda Winslow attended the Western Regional Space Grant meeting in Moran, WY from September 24-September 27, 2008.

Keiji Yoshimura, Sabrina Savage, David McKenzie, and Dana Longcope attended the 2nd Hinode Science meeting in Boulder, CO from September 27-October 4, 2008.

Vincent Corbin attended the Clock and Quantum: Time and Quantum Foundations Conference in Waterloo, Ontario, Canada from September 27-October 2, 2008.

OUTREACH

Silvina Guidoni volunteered for the SPOT activities for Kids, as part of the "Solar Variability, Earth's Climate and the Space Environment" workshop. June 3, 2008.

Yves Idzerda presented a public lecture at the University of Montana in Missoula, MT on August 8, 2008.

VISITORS

Silvina Guidoni hosted Dr. Celso Aldao . He had discussions with Alan Craig, Ives Idzerda, John Neumeier, WeerasinghePriyantha, Hugo Schmidt, Recep Avci, Rufus Cone, and Jerry Lapeyre. He gave a colloquium on Sept 18. entitled "Experiments and modeling of Si(100) after deposition, adsorption, and etching."

John Mitchell of Argonne National Laboratory visited the Neumeier lab between April 24-25, 2008. He gave a colloquium on April 25 entitled "Crystal Synthesis of Magnetic Oxides" or "How to Help Out Your Friendly Neighborhood Physicist."

During July 24 – August 11, 2008, Professor Thomas Böttger visited the Cone-Thiel Group and was engaged in data analysis and writing. The optical materials that Böttger, Charles Thiel, and Rufus Cone are studying are being used by international group for quantum cryptography and quantum memory for secure communications as well as in the MSU Spectrum Lab for optical signal processing and other high-bandwidth applications, where optical materials are replacing electronic circuits. Tom is an Assistant Professor of Physics at the University of San Francisco, San Francisco, California.

Michael Smith of Santa Fe Community College visited and collaborated with the Neumeier group throughout June and July 2008.

ALUMNI & EMERITUS NEWS

Hector Calderon is a visiting Assistant Professor at Carleton College in Northfield, MN.

Sytil Murphy is a postdoc at Kansas State University in Manhattan, KS.

Jonathan Cirtain of the Marshall Space Flight Center is working on the Solar Ultraviolet Magnetograph Investigation (SUMI) project. This project is scheduled for launch in April, 2009 to study the transition region of the sun. The story can be accessed at:
http://science.nasa.gov/headlines/y2008/05sep_sumi.htm?list1052937

We note with sadness and fond memories the passing of Patty Drumheller, wife of Emeritus Professor Jack Drumheller.

Physics News

Cartwheel Coronal Mass Ejection

Sabrina Savage, David McKenzie and Junho Shin attended a workshop at the Center for Astrophysics on August 13-15 to discuss the observations of the Cartwheel Coronal Mass Ejection (CME). This CME occurred April 9, 2008 as the result of a large solar flare. It exhibited some unusual twistings which is the basis for its name. It was seen by several instruments (including Hinode, TRACE, and STEREO) which made analysis quite exciting.