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AWARDS & NEW POSITIONS

Trae Winter has been awarded not one but TWO "Outstanding Student Paper Awards" for his presentations at the May 2005 American Geophysical Union meeting. Trae's presentations were:

"Improving Flare Simulations by Combining Hydrodynamics Modeling with Stochastic Particle Transport"

and

"Education & Public Outreach in Montana, Supporting the Solar Dynamics Observatory"

Undergraduate student Mark Munro (Malovichko/Grachov group) received an award \$400 from the ESR-EPR society for his presentation at the 47th *Rocky Mountain Conference on Analytical Chemistry* (Denver, August, 2005).

Bill Hiscock has been appointed as MSU's representative to the Association of Universities for Research in Astronomy (AURA) by President Gamble.

PHYSICS NEWSLETTER

Compiled by:
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Staff, and Alumni

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2nd Annual GEEKS IN THE CREEK



A fun time was had by all!

Jerry DiMarco attended the AAPT meeting in Salt Lake Aug. 7-10, attending sessions hosted by the Physics Instructional Resource Association (PIRA), and helping with the PIRA Resource Room and the Evening Demo Show.

The Society of Physics Students represented the physics department at this year's Catapalooza (Aug. 24-25). For two days, SPS members withstood the broiling heat to spread the word on all things physics. We also got more members to sign up.

PUBLICATIONS SUBMITTED

"EPR of Nd^{3+} in congruent and nearly stoichiometric lithium niobate". G.Malovichko, V.Grachev, S.Okulov et al., submitted to *Physica Status Solidi (b)*.

PUBLICATIONS ACCEPTED

"Low Order Dynamo Models", A.L. Wilmot-Smith, P.C.H. Martens, D. Nandy, E.R. Priest, S.M. Tobias, accepted by Mon. Not. R. Astron. Soc.

"Effects of nonzero neutrino masses on black hole evaporation", Daniel Bambeck and William A. Hiscock, accepted for publication, Classical and Quantum Gravity, gr-qc/0506050.

PUBLICATIONS

"Multifrequency spectroscopy of defects in complex oxides." G. Malovichko, V. Grachev, O. Schirmer. *Physica Status Solidi (a)*, **202**, 207–212 (2005).

PROPOSALS FUNDED

"Using Metallic Interlayers to Stabilize Metal-Metal Interfaces", NSF, \$120,000/year beginning 8/15/2005 for 3 years, Dick Smith.

"Development of advanced materials for optoelectronics and optical communication technologies"; Montana Board of Research & Commercialization Technology, \$240,000, PI: G.Malovichko, Co-PI: V. Grachev, 2 years.

"Identification of atomic defects due to radiation in non-linear optical crystals used for space-based laser systems", NASA, \$95,254, G.Malovichko, 12 month.

"Beginnings of Solid State UV Photoemission", G.J. Lapeyre, International Conference on Semiconductor Interfaces in Aix-en-Provence, France, Jul. 2-14.

"Buried Iron Films Investigated with Energy Resolved Fluorescence", Jessica McChesney, International Conference on Semiconductor Interfaces in Aix-en-Provence, France, Jul. 2-14.

"Platinum induced reconstructions on high miscut Si(111)", J.L. McChesney, A. Bostwick, E. Rotenberg, G.J. Lapeyre, The 13th General Conference of the European Physical Society, Bern, Switzerland, Jul. 2-14.

INVITED TALKS

"Multiresonance, multifrequency spectroscopy of rare-earth and transition ions in lithium niobate". G.Malovichko. International meeting "*LiNbO₃, from material to device, from device to system*", Metz, France, May 23-26, 2005

CONTRIBUTED TALKS

"Improving Flare Simulations by Combining Hydrodynamics Modeling with Stochastic Particle Transport", H. T. Winter, P. Martens SPD/AGU Joint Meeting, New Orleans, May 24 2005.

"Education & Public Outreach in Montana, Supporting the Solar Dynamics Observatory", Winter, H D, McKenzie, D E, SPD/AGU Joint Meeting, New Orleans, May 23 2005.

"Progress toward a water-vapor differential absorption lidar (DIAL) using a widely tunable amplified diode laser source," M. D. Obland, K. S. Repasky, J. A. Shaw, J. L. Carlsten, L. S. Meng, SPIE Optics and Photonics Conference, San Diego, CA August 1-4, 2005.

POSTER PRESENTATIONS

"Non-equivalent neodymium centers in congruent and stoichiometric lithium niobate crystals". V.Grachev, G.Malovichko, and M.Munro. International conference "*LiNbO₃, from material to device, from device to system*", Metz, France, May 23-26, 2005.

"EPR and optical study of defects in irradiated single crystals of lithium tetraborate". G. Malovichko, V.Grachev. Ya. Burak, A. Matkovskii. *47th Rocky Mountain Conference on Analytical Chemistry*. Denver, USA, July 30 - August 4, 2005.

"Hidden and broken symmetry in spin-Hamiltonian for three spin clusters". V.Grachev. *47th Rocky Mountain Conference on Analytical Chemistry*. Denver, USA, July 30 - August 4, 2005.

"Q-band EPR and ENDOR of Nd³⁺ in stoichiometric Lithium Niobate". M.Munro, G.Malovichko, V.Grachev, E.Kokanyan. *47th Rocky Mountain Conference on Analytical Chemistry*. Denver, USA, July 30 - August 4, 2005.

"A Graduate-Level Online Course on Free-Body Diagrams for Middle School Teachers", Larry Kirkpatrick, AAPT meeting, Salt Lake City, Aug. 6-10.

SEMINARS

Condensed Matter/Surface Science

"High Performance Piezo/Ferroelectric Single Crystals: Materials Development and Understanding", Prof. Zuo-Guang Ye of Simon Fraser University, Burnaby, BC, July 15.

REU and RET Presentations 2005

Michael Hess, Southern Oregon University, (Advisor: Alan Craig)

Frequency-Doubled Quantum Dot External Cavity Laser

Kenneth Crawford, Blackfeet Community College (Advisor: Recep Avci)

Crazy Glue and Bacterial Adhesion

Cary L. Pint, University of North Iowa (Advisor: R. J. Smith)

Theoretical Description of the Growth and Multilayer Behavior of Ag/Al and Ti/Al Using BFS

Desiree Peone, Salish and Kootenai College, Pablo, MT (Advisor: Aleks Rebane)

Two Photon Optic Storage Materials

Amy Williams, Headwaters Academy, Bozeman, MT (Advisor: Yves Idzerda)

Liaison Facilitated K-12 Outreach for the Hard Sciences

Poster Presentations (2 minutes each)

Tyler Templeton, Lyon College, Batesville, AR (Advisor: Recep Avci)

Interaction energies and forces between a colloidal probe and planar surface in electrolyte solutions

Randy Krogstad, Montana State University, (Advisor: John Neumeier)

High Purity Copper Capacitance Dilatometer

Jamie Lomax, St. Lawrence University, Canton, NY (Advisor: R. J. Smith)

Oxygen-18 Uptake and Nuclear Reaction Analysis on Zirconium and Yttria Stabilized Zirconia

Tom Mercer, Montana State University, (Advisors: Y. U. Idzerda and M. Young along with K. Gilmore, H. Li, M. Allen, M. Parker and M. Klem)

In Situ EPR for the Mineralization of Horse Ferritin

Elizabeth Huynh, DePaul University, Chicago, IL (Advisor: John Neumeier)

Single Crystal Growth of Pr_{0.5}Sr_{0.5}MnO₃

OUTREACH

Bill Hiscock gave two evening talks, on Mars Exploration and Extrasolar Planets, at the Madison Campground in Yellowstone in conjunction with the Museum of the Rockies/Southwest Montana Astronomical Society sky viewing sessions, July 8-9. The Mars talk was reported by YNP rangers to have set a new all-time attendance record for Madison Campground campfire talks.

VISITORS TO RESEARCH GROUPS

Erwan Monot, a graduate student from France, completed his visit to the MSU Physics Department from January – August, 2005, on an exchange program between MSU and the University of Lyon I in Lyon, France. Erwan, Rufus Cone, and Charles Thiel carried out spectroscopic measurements on Er³⁺-doped crystals with potential for quantum computing applications and for Spectrum Lab's device programs. The exchange program was organized by Rufus Cone and Bernard Jacquier with the MSU Office of International Programs., and it offers MSU students the option of terms, summers, or graduate study in France while registered as an MSU student.

Tyler Berch joined the Cone Group at the end of August as a graduate student. Tyler will be involved in rare earth spectroscopy during Fall Semester.

Dr. Tom Böttger, Assistant Professor in the Department of Physics, University of San Francisco, spent the month of July visiting and collaborating with Charles Thiel and Rufus Cone on experimental measurements and manuscripts on several Er³⁺:Y₂SiO₅ materials. These measurements and the associated theory provide the prototype system for spectral hole burning devices at the 1.5 micron communications band.

TRAVEL

. Mike Obland traveled to NASA Goddard Space Flight Center in Greenbelt, MD, June 1 to July 15 to conduct collaborative research with Dr. Jonathan Rall on a Ytterbium-doped fiber optic laser amplifier for measuring Antarctic polar stratospheric clouds.

Mike Obland traveled to NASA JPL in Pasadena, CA, June 25-29 to participate in the Planetary Science Summer School, designing a mission proposal for a robotic lander to Europa.

Aleks Rebane traveled to Kyoto, Japan to attend the 14th Annual International Laser Physics Workshop, and then to Tokyo, Japan to attend the Pacific Rim Conference on Lasers and Electro-Optics 2005, Jul. 2-17.

Jerry Lapeyre and Jessica McChesney attended the International Conference on Semiconductor Interfaces in Aix-en-Provence, France, Jul. 2-14. Jerry also attended the 13th General Conference of the European Physical Society in Bern, Switzerland during that same time period.

Sachiko Tsuruta traveled to State College, PA, to collaborate with Shane Larson on Gravitational Waves and with Dirk Grape on AGN observations, Jul. 4-9.

Neil Cornish attended a LIST meeting and the European Physical Society meeting held in Berne, Switzerland, Jul. 6-16.

Yves Idzerda traveled to Baltimore, MD, to attend the MMM Program Committee meeting, then on to the ALS Science Advisory Committee Meeting, Oakland, CA, Jul. 7-13

John Neumeier and Rongmei Ruth Chien attended the 16th American Conference on Crystal Growth and Epitaxy in Big Sky, MT, Jul. 10-15.

Dana Longcope attended the SHINE meeting held in Kailua-Kona, HI, Jul. 11-15.

Bill Hiscock, together with the MSGC BOREALIS team and the Colorado Space Grant Consortium, conducted the Fourth Starting Student Space Hardware Programs Workshop in Boulder, CO, July 14-16.

Dave Klumpar, John Getty, Dave McKenzie, Jack Dostal, in conjunction with faculty from Salish Kootenai College and teachers from the Flathead Indian Reservation, conducted the MUCERPI summer camp, July 16-29 in Polson and Bozeman.

Brian Larsen and Timothy Orr performed satellite testing at San Luis Obispo, CA, Jul. 19-22.

Ron Hellings attended and presented an invited talk at the Pulsar Timing Array – Nanohertz GW Telescope Workshop held in State College, PA, Jul. 20-23.

Loren Acton collaborated at Lockheed on Yohkoh Legacy business in San Jose, CA, Jul. 23-30.

Bill Hiscock visited the NASA Ames Research Center in conjunction with his duties as PI on the Education Associates Program, July 25-26.

Charles Kankelborg, Mike Chase, Lewis Fox, Hans Courier, Chris McIntosh, Ehson Moleh and Reggie Mead traveled to Las Cruces, NM, to perform MOSES Rocket integration tests and launch at White Sands, Jul. 26-Aug. 26.

Jeff Adams and Jack Dostal, in conjunction with faculty from Salish Kootenai College and teachers from the Flathead Indian Reservation, conducted the 2nd annual Sun-Earth Connection Teacher Workshop July 27-28 at Salish Kootenai College in Pablo, MT.

G. Malovichko , V.Grachev, and M.Munro participated in the 47th Rocky Mountain Conference on Analytical Chemistry. Denver, USA, Jul. 30 – Aug. 4, 2005.

Mikhail Drobijev and Nikolay Makarov traveled to San Diego, CA, to attend the SPIE annual meeting, and Air Force Meeting, Jul. 30-Aug. 11.

John Neumeier attended the Workshop on Physics of Novel Oxides in Telluride, CO, Jul. 30-Aug. 7.

Ron Hellings attended a GRS Stakeholders Meeting at JPL in Pasadena, CA, Aug. 1-3.

Dave Klumpar, Danny Jacobs, Brian Larsen, Mike Obland, Marshall Clark, Chad Bohannon, Nathan Greenfield, Calvin Coopsmans, Keith Mashburn, Drew Eldeen, Dylan Solomon and James Wyatt participated in the 19th Annual AIAA/USU Conference on Small Satellites and International CubeSat Developers Workshop, Logan, UT, Aug. 6-11.

Aleks Rebane visited Coherent Inc., Santa Clara, CA, in connection with the purchase of a new laser system Aug. 2 and 3rd. Aug. 7-12 he attended an Air Force Office for Scientific Research Program Review Meeting held in San Diego, CA.

Larry Kirkpatrick attended the AAPT meeting in Salt Lake City from 6-10 August.

Mike Obland, Brian Larsen, Dave Klumpar, and Danny Jacobs traveled to the Small Satellite Conference in Logan, Utah, August 6-11, 2005.

Bennett Link attended a conference on Neutron Stars at the cross-roads in Physics held in Vancouver, BC, Aug. 9-19.

Bill Hiscock and Dave Klumpar attended the MIMIC (Space Grant Student Spacecraft to Mars) meeting at JPL, August 12-15.

Mingzhen Tian traveled to Tampa, Florida for ARO Quantum Computing program annual review, Aug. 21-26.

Yves Idzerda attended the ALS Proposal Study Panel Review Meeting in Berkeley, CA, Aug. 25-29.

**NEW TO THE
DEPARTMENT**

This year's graduate students:



Harsh Bhatkar



Camas Key



Tom Rust



Tyler Berch



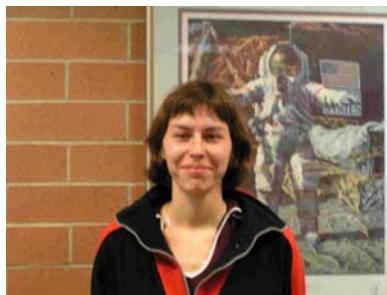
Tae Kim



Sabrina Savage



Kevin Flanagan



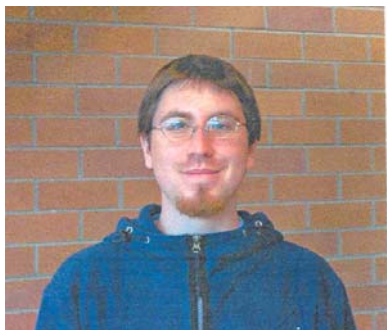
Maria Kazachenko



Jason Scott



Anna Malanushenko



Andres Munoz



Jacob Thiel

Faculty, Adjunct, Research:



*Jiong Qiu
Assistant Professor
Space Physics*



*Shannon Willoughby
Adjunct Assistant Professor*



*Dr. Valdimir Pankratov from Riga
(Latvia) joined Magnetic Resonance
Spectroscopy Group in July.*