MONTANA STATE UNIVERSITY

Mountains & Minds

Physics Department Newsletter
(http://physics.montana.edu)

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Fall 2012

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PHYSICS NEWSLETTER
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Faculty, Students, Staff, and Alumni

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Note: All present and former students, faculty and staff associated with the Physics Department are invited to join the recently formed private Linkedin group for MSU Physics Alumni

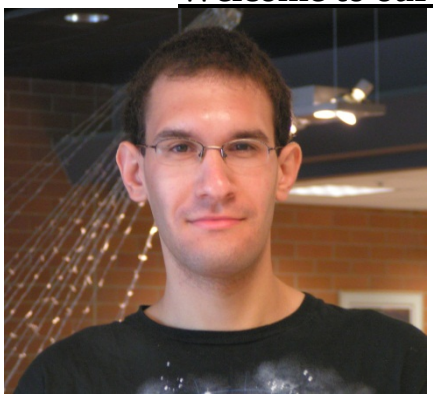
Jack Drumheller with Prof. Galina Malovichko tuning an ESR spectrometer (2003).

Emeritus Professor John Earl Drumheller (1931 – 2012)

John (Jack) Earl Drumheller was born Dec. 19, 1931 in Walla Walla, WA, and moved to Spokane, WA with his family at the age of seven. He graduated from Lewis and Clark High School in 1949 and joined the ROTC in college, attending Washington State University in Pullman, WA. In high school and college, Jack was active in the choir and chorus, and sang with a barbershop quartet. He was a member of the Tau Kappa Epsilon fraternity and graduated from WSU with a B.S. degree with Honors in physics in 1953. Upon graduation, Jack worked a short stint at Douglas Aircraft Co. as a systems engineer in Santa Monica, Calif., and attended classes at UCLA. He also worked as a research engineer for Kaiser Aluminum in Trentwood, WA. He served in the Air Force at Lowry AFB from 1954 to 1956, where he was a special weapons officer. Jack and his wife Patty married in 1956, and settled in Boulder, CO., where Jack attended graduate school. He earned his M.S. in 1958 and Ph.D. in physics in 1962 from the University of Colorado. Jack and his family moved to Zurich, Switzerland, for two years where Jack was a post-doctoral research associate at the University of Zurich. In 1964, they moved back to the U.S., where Jack joined the faculty at Montana State University. His research specialized in solid state experimental physics, using electron spin resonance to study a variety of magnetic systems and phase transitions in lower dimensions. He won many teaching and research awards while at MSU. Jack was thesis advisor and mentor for 14 Ph.D. students from 1969 to 1998. He served as Dean of the College of Letters and Sciences from 1991 to 1995 and as Interim Provost 1995-1996. He retired in 1998.

Jack enjoyed flying, skiing, tennis, basketball, golf and playing piano. He enjoyed soaring over the Bridger Mountains while piloting sport gliders. Jack traveled widely, professionally and for fun, with Switzerland, Scotland and Greece among his favored destinations. In 2008, Jack lost Patty to cancer after 52 years of marriage. A year later, Jack reconnected with a WSU college sweetheart, Valerie Violet (Leber) Keyes. Jack and Valerie were married in 2010, and spent just two short years together before Jack lost his long battle with cancer. Jack will be remembered by his friends and family as a generous and loving soul who shared his great intellect and good humor with everyone. Jack died peacefully at his Bridger Canyon home on Oct. 6, 2012, in the presence of his wife and three children.

Welcome to our Fall 2012 Incoming Class of Graduate Students



Dimitry Azyenberg

Ana Baselga

Andrew Hammer

Nick Loutrel

Keith Johnson

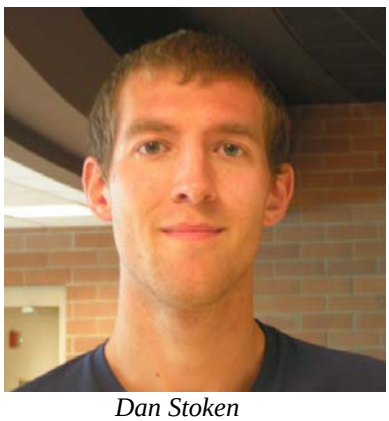
Shane Mayer-Gawlik

Cooper McCann

Sasha Mikhailov

Meg Millhouse

Jared Newman



Dan Stoken

Caleb Stoltzfus

Visiting Professor AY 2012-2013

Dr. Phil Judge, High Altitude Observatory
National Center for Atmospheric Research, Boulder, CO

It is a pleasure to have Dr. Phil Judge in the department as our visiting professor for AY12-13. Phil comes from the High Altitude Observatory, NCAR, where he is a Senior Scientist. Phil has considerable experience on the academic side as well, having mentored several graduate students, and lectured at universities around the globe. He has had adjunct appointments at UC – Boulder, and has served on numerous professional committees. Phil's recent research grants include investigations of thermal and magnetic models for ion-neutral chromospheric studies. While here, Dr. Judge is working primarily with Charles Kankelborg and Sarah Jaeggli on the IRIS project, as well as with other members of the solar physics group. Phil has been very enthusiastic about the opportunity to teach two graduate courses on special topics during his visit. In Fall 2012 he taught PHSX515 Advanced Topics in Physics: Transport Processes in Plasmas. During Spring 2013, his course title is "Spectroscopy of Plasmas", with instruction on how we learn about plasmas (fully or partially ionized) from the radiation emitted by them. Both courses have been well received by our graduate students. Support for the Visiting Professor program in Physics comes in part from the Office of the MSU Provost, the Office of the Vice-President for Research, Creativity, and Technology Transfer, the Office of the Dean of the College of Letters and Science, and the Physics Department. Phil also has partial support from his home institution, HAO.

GENERAL NEWS

Space Public Outreach Team (SPOT) members Jocelyn Kirschenbaum and Ethan Schreuder, both MSU students, traveled to Victor School, Victor, MT, south of Missoula, to make a presentation "Mission to Mars". SPOT presenters travel around the state giving presentations to small rural schools on subjects relating to NASA, the planets and space exploration. Kirschenbaum is a senior majoring in science education and minoring in astrobiology, and Schreuder is a third-year geology student who is also interested in paleontology. For more information about the program read the article in the Ravalli Republic newspaper http://www.ravallirepublic.com/news/local/education/article_c70bbdf0-4a4b-11e2-adb8-0019bb2963f4.html#.UNPg5uY8bqI.email. You can also learn more about the Montana Space Grant Consortium in their newsletter. http://spacegrant.montana.edu/documents/MSGCNewsletter2013.pdf.

MSU Champ to the edge of space. The BOREALIS Flight Group had a great flight on Cat-Griz weekend. The weather cooperated, resulting in a vertical launch from the road right next to the lab in Bozeman. The team reported that the "rise rate could have been a little faster, but not over-filling probably helped to get us to over 99,000 feet. Recovery was easy. Luck was on our side as we missed landing in the major power transmission line that bisects our landing area and was only a few hundred yards from where we landed. For fun we thought we would support our football team and flew Champ and Monte to the edge of space. Their epic battle apparently got out of hand, or the remaining nozzle from the balloon, which was still attached to our lead line got caught up in our puppet support and tangled our parachute and command box together. The resulting mess ripped up our command capsule pretty good. We recovered everything except for Champ and Monte who apparently finished their battle by seeing who could break Felix Baumgartner's free fall record." Here's a spectacular video of the ride. http://www.youtube.com/watch?v=I1ov8VKHlOM&feature=em-share_video_user

Dean's List for Fall 2012. Congratulations to our Physics Majors making the Dean's List for Fall 2012 (GPA for term > 3.5):Warren Coulomb, William Dupree, Ryan Galloway, Elliot Gray, Jay Gray, Conor Hagan, Brooke Hampton, Brennan Ireland, Jacob Parker, and Anna Price. Congratulations also to those on the President's List for Fall 2012 (term GPA of 4.0): Tyler Brewer, John Pribyl, and Johann Reinhardt.

Fall 2012 Party: The annual Fall Party, regularly held at the Hyalite Youth Camp on the reservoir, had to be relocated this fall because of the uncertain fire conditions that existed at the time. So, we gathered on Saturday, September 15th, at the home of Dick and Jennifer Smith. The food and companionship were great, as usual, with a beautiful fall day to set the stage. The beverages were also great, as tested and certified by a keg stand demonstrated with the help of an unnamed postdoc in the department.

Happy birthday HRBE: MSU's grand little satellite, has now operated for more than one year in orbit around Earth. The William A. Hiscock Radiation Belt Explorer (HRBE), formerly known as Explorer-1 [Prime] Unit 2 (E1P-U2) has now exceeded one year of operation in orbit around Earth, wildly surpassing all design expectations. HRBE was launched into space at 3:48 a.m. MDT on October 28, 2011, and began operating about 3-hours later. Today the satellite remains healthy and continues to gather scientific data on the ionizing radiation environment in near-Earth space, in a region known as the Van Allen Radiation Belts. See complete story: http://www.montana.edu/cpa/news/nwview.php?article=11570

Fall Commencement 2012: MSU brought back the tradition of a Fall Commencement ceremony beginning this semester with graduation ceremonies on December 15, 2012. We offer our congratulations to our most recent Ph.D., Dr. Muhammedin Deliorman, and to his thesis advisor, Research Professor Recep Avci. The title of Muhammedin's dissertation is "The Immunoimmobilization of Living Bacteria on Solid surfaces and its Applications". Congratulations go as well to M.S. recipients, Erin Casey and Stephen Crouch, both of whom completed degree requirements in summer 2012.

Halloween Costume Ball: As has become a tradition in the department, the Physics staff dressed to the max for the October 31 festivities. This year's theme was a "Circus Side Show", not entirely out of character for this department. Dick felt the need to call a faculty meeting that morning at 9 a.m., so the staff, in full costume, arrived at 9:50 a.m. sharp to rescue their "ringmaster" from the meeting. The group proceeded to visit several departments on campus, and of course won the now non-existent prize for Best Department Costume Extravaganza.

Governor's Energy Internships: Four undergraduates received Governor's Energy Internship awards for solid oxide fuel cell research in Hugo Schmidt's lab - Josh Sinrud and Houda Zaazaa for work completed in August, and Jake Danczyk and Lily Westerhoff for work completed in December. Unfortunately, Montana terminated this fine Internship program as of 12/31/12.

Holiday Feast 2012: On December 5, 2012, approximately 70 members of the department and their families gathered for the annual December Awards and Holiday Feast at the Bozeman Senior Center. It is always a pleasant evening to join with students, staff, faculty and families, and to catch up on the travels and adventures of our emeritus faculty and their families. Unfortunately, the department photographer did not attend this year so you must all revel in your mental images of past celebrations.

Other Visitors to the Department Professor Thomas Böttger, Chair of the Physics Department, University of San Francisco, visited the Cone/Thiel group during October 5-12, 2012 for experiments on Tm:YAG crystals that will be used for quantum cryptography, quantum memory, and quantum repeaters for secure communications and for superior optical frequency references for stabilizing laser frequency down to the part in 10^{15} stability range.

Roy Nelson, Sr. Business Area Manager for Laser Applications, Ball Aerospace & Technologies Corp, Boulder, CO, visited Rufus Cone on November 15 and 16, 2012, and presented a Physics Colloquium entitled, "*Total Sight™ Real-Time, Full-Motion, 3D Color Imaging System*."

PHYSICS ALUMNI NEWS

Chih-Long Tsai, Ph.D. May 2010 under the mentorship of Prof. Hugo Schmidt, is now at the Forschungszentrum Juelich in Germany. He is starting work on lithium-air battery research, and says they are looking for a postdoc and two graduate students to work on this project.

MSU graduate Michelle Larsen (B.S. 12/'93; M.S. 12/'95 with Greg Francis; Ph.D. 5/'01 with Bennett Link) will become the next President and CEO of the Adler Planetarium beginning January, 2013. This is a highly visible and prominent position; the Adler is the oldest planetarium in the Western Hemisphere, and is one of the more prominent cultural institutions for astronomy education in North America. She will be the first female President of the Planetarium. For more information see the full article: http://www.adlerplanetarium.org/documents/press-kits/New_Adler_President_Press_Release.pdf

Now on Linkedin: We have recently formed a private group on Linkedin for all former and present students, faculty, and staff associated with the MSU Physics Department. Please join us in the Montana State Physics Alumni Linkedin group, currently moderated by Dick Smith.

TRAVEL

September, 2012
Recep Avci gave a talk at the EUROCORR 2012 Meeting in Istanbul, Turkey, September 9-13, 2012.
Aleksander Rebane attended the TOPBIO Consortium PI Meeting (Midterm Review and School of Spectroscopy) in Bologna, Italy, September 10-13, 2012.
Piet Martens traveled to Washington, D.C. to participate in the meeting “Life in the Cosmos” at and organized by the Smithsonian Institution.

October, 2012
Ernest Amouzou studied with Dibyendu Nandi at IISERKOL in Kolkata, India and attended the International Symposium on Solar-Terrestrial Physics conference in Pune, India, October 6 - December 14, 2012.
Recep Avci and Kilean Lucas attended the Pacific Rim Meeting on Electrochemical Science in Honolulu, Hawaii October 7-11, 2012, where Dr. Avci presented a paper.
Yves Idzerda attended the User Meeting and conducted experiments at the Advanced Light Source in San Francisco, CA, October 8-11, 2012.
Dana Longcope addressed the Tangled Magnetic Field in Astrophysical Plasmas meeting in Edinburgh, UK, October 14-20, 2012.
David McKenzie attended the NASA Review Panel in Arlington, VA, October 15-19, 2012.
Nick Childs presented a poster at the NWS APS Meeting in Vancouver, CA, October 19-20, 2012.
Bennett Link attended the NASA Astrophysics Theory Review Panel in Washington, D.C., October 21-24, 2012.
Nicolas Yunes chaired a session at the Perimeter Institute Workshop on “Experimental Searches for Quantum Gravity” in Waterloo, Canada, October 22-26, 2012.

Lucas Tarr collaborated with Dr. Xudong Sun and Todd Hoeksema at Stanford and gave the weekly Solar Group Seminar in Palo Alto, CA, October 23-26, 2012.
Dana Longcope attended the Observatory Management Group Meeting in Orange County, CA, October 29, 2012 and attended the SDO/EVE Science Conference in Yosemite, CA, October 31, 2012.

November, 2012
Dick Smith attended the annual meeting for Midwest Physics Chairs in Chicago, IL, November 4, 2012.
Petrus Martens presented a seminar at IIAP and engaged in scientific discussion in Bangalore, India, November 1-4, 2012. He also participated in IISTP 2012 in Pune, India, November 6-9, 2012. Piet then delivered an invited talk, public lecture, and seminar, and pursued collaborations in Kolkata, India, November 11-17, 2012.
Keiji Yoshimura traveled to ISAS/JAXA in Sagamihara, Japan November 15-24, 2012, to discuss the science operation of the Hinode satellite.
Jiong Qiu attended the HTST Science Working Group Meeting in Boulder, CO, November 25-27, 2012.
Nicolas Yunes gave a talk at the Friday Research Seminar organized by Professor Frans Pretorius at Princeton University, Princeton, NJ, November 18-31, 2012.
Richard Canfield gave a talk at "Solar in Sonoma: Tracing the Connections in Solar Eruptive Events" in Petaluma, CA, November 27 – December 2, 2012.

December, 2012
Keri Hallau, with Jake Morison and Hannah Schuele, gave a talk and presented a poster at the 2012 Annual American Geophysical Union Fall Meeting in San Francisco, CA, December 3-6, 2012.
Yves Idzerda participated in the APS Sorter Meeting in College Park, Maryland, December 6-7, 2012.
John Neumeier attended the Brazilian School of Superconductivity in Olinda, Pernambuco, Brazil, December 9-15, 2012.
Recep Avci attended the MURI Program Review in Washington, D.C., December 11-13, 2012.
Neil Cornish attended the Miami 2012 topical conference on elementary particles, astrophysics and cosmology in Ft. Lauderdale, Florida, December 17-18, 2012.

MANUSCRIPTS SUBMMITTED

"Narrow inhomogeneous and homogeneous optical linewidths in a rare earth doped transparent ceramic", Alban Ferrier, C. W. Thiel, Biagio Tumino, Mariola O. Ramirez, Luisa E. Bausa, R. L. Cone, Akio Ikesue, and Philippe Goldner, submitted to Phys. Rev. B Rapid Commun., October 2012.

"Asymptotically Matched Spacetime Metric for Non-Precessing, Spinning Black Hole Binaries", Louis Gallouin, Hiroyuki Nakano, Nicolas Yunes, Manuela Campanelli; arXiv:1208.6489 [gr-qc].

"Gravitational Waves from Quasi-Circular Black Hole Binaries in Dynamical Chern-Simons Gravity", Kent Yagi, Nicolas Yunes, Takahiro Tanaka; arXiv:1208.5102 [gr-qc].

"Outflow and Dark Bands at Arcade-like Active Region Boundaries", J.T. Scott, P. C. H. Martens, and L. Tarr, submitted to Astrophysical Journal.

"Fast Differential Emission Measure Inversion of Solar Coronal Data", Joseph Plowman, Charles Kankelborg, and Petrus Martens, submitted to Astrophysical Journal.

"Development of the Newtonian Gravity Concept Inventory", K. Williamson, S. Willoughby and E. Prather, submitted to Astronomy Education Review.

"Wavelength and electric poling effects on photovoltaic properties of indium tin oxide/$BiFeO_3$ ceramic/Au structure," C.-S. Tu, C.-M. Hung, M.-D. Jiang, J. Anthoninappen, V. H. Schmidt, and R. R. Chien, submitted to Appl. Phys. Lett.

"Photoelectric responses and origin in multiferroic $BiFeO_3$ ceraamics," C.-S. Tu, C.-M. Hung, V. H.. Schmidt, R. R. Chien, H. C. Tu, and M.-D. Jiang, submitted to J. Appl. Phys.

"Effect of light intensity and electric poling in photovoltaic properties of $BiFeO_3$ ceramics," C.-S. Tu, C.-M. Hung, V. H. Schmidt, R. R. Chien, J. Anthoninappen, and M.-D. Jiang, submitted to Phys. Rev. B.

"Dielectric response and origin in antiferromagnetic/ferroelectric (1-x)BiFeO3-(x)aBaTiO3 ceramics," C.-S. Tu, C.-H. Lin, V. H. Schmidt, R. R. Chien, and Y.-T. Peng, submitted to J. Appl. Phys.

"Turbulent Dynamics in Solar Flare Sheet Structures Measured with Local Correlation Tracking", D.E. McKenzie, submitted to the Astrophysical Journal.

"Conceptual Demonstration of Hypervelocity Dust Particle Detection", Nicholas B. Childs, Anthony Shu, Andrew Collette, Keith Drake, Mihaly Horanyi, submitted to The Physics Teacher, September 2012.

"Electronic Current Distribution Calculation for a Ni-YSZ Solid Oxide Fuel Cell Anode", Nicholas B. Childs, Cameron Law, Richard Smith, Stephen Sofie, Camas Key, Michael Kopcyzk, Michael Lerch, submitted to Fuel Cells, September, 2012.

"RBS Investigation of Volatile Gases Produced in Solid Oxide Fuel Cell Systems", C.F. Key, W. Priyantha, J. Regar, H. Chen, J Eziashi, R. J. Smith, P. Gannon, N. Childs, P. Gentile, S. Sofie, submitted to AIP Conference Proceedings for 22nd International Conference on Applications of Accelerators in Research and Industry, August, 2012, Ft. Worth, TX. Submitted September 2012.

PUBLICATIONS

“Giant Negative Thermal Expansion in La-doped $CaFe_2As_2$”, A. Rebello, J. J. Neumeier, Z. Gao, Yanpeng Qi and Yanwei Ma, Phys. Rev. B 86, 104303 (2012).

"Quantitative Comparison of Linear and Non-linear Dimensionality Reduction Techniques for Solar Image Archives", J. Banda, R. Angryk, P. Martens, in: Proceedings of the 25th International FLAIRS Conference (FLAIRS '12), Marco Island, Florida, May 2012, pp. 376-381.

"All Quiet on the Solar Front: Origin and Heliospheric Consequences of the Unusual Minimum of Solar Cycle 23", (Invited Paper) Dibyendu Nandy, Andres Munoz-Jaramillo, Petrus C. H. Martens, proceedings of the SCOSTEP Workshop on "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere, Sun and Geosphere", Sun and Geosphere 7(1), 16-21.

“Gravitational Waves from Quasicircular Black-Hole Binaries in Dynamical Chern-Simons Gravity”, Kent Yagi, Nicolás Yunes, and Takahiro Tanaka, Phys. Rev. Lett. 109, 251105, December 2012.

“Asymptotically matched spacetime metric for non-precessing, spinning black hole binaries”, Louis Gallouin, Hiroyuki Nakano, Nicolás Yunes and Manuela Campanelli, 2012 Class. Quantum Grav. 29, 235013 doi:10.1088/0264-9381/29/23/235013**.**

“Tidal heating and torquing of a Kerr black hole to next-to-leading order in the tidal coupling”, K. Chatziioannou, E Poisson, N Yunes, arXiv preprint arXiv:1211.1686, 2012 - arxiv.org

“Gravitational Waves from Quasi-Circular Black Hole Binaries in Dynamical Chern-Simons Gravity”, K. Yagi, N Yunes, T Tanaka - arXiv preprint arXiv:1208.5102, 2012 - arxiv.org

"The origin of photovoltaic responses in $BiFeO_3$ multiferroic ceramics," C,-S. Tu, C.-M. Hung, V. H. Schmidt, R. R. Chien, M.-D. Jiang, and J. Anthoninappen, J. Phys.: Condens. Matter 24 (2012) 495902.

PROPOSALS SUBMITTED

“Acquisition of a high-performance Xray diffraction and scattering system for corrosion research”, Recep Avci, Office of Naval Research, $522, 573, 10/1/12

“Is the world going to end on 12/21/12?”, Shannon Willoughby, MSGC, $42, 502, 10/15/2012

Gravitational Wave Detection and Characterization”, Neil Cornish, NSF, $331,343, 10/18/2012.

Hidden and approximate symmetry in magnetic resonance”, Valentyn Grachov, NSF, $440,638, 10/25/2012.

“Origin of giant nonlinear optical susceptibility in composite materials with embedded nonmetallic nanoparticles”, Galyna Malovychko, NSF, $473,744, 10/25/12.

Phase Transitions in Metals and Novel Condensed Matter systems”, John Neumeier, NSF, $481,050, 10/31/2012.

“Materials World Network: Inhibiting Decoherence in Crystals Through Controlled Structural Disorder”, Rufus Cone, NSF, $330,046, 11/13/2012.

“Cooperative Networking Strategies for Enhancing STEM Education across Rural Montana”, submitted 11/13/12 by Randy Babbitt to NSF with Department of Education; $1,199,945.

“Hardware and Scene Optimized Imaging for Autonomous Navigation”, Larry Springer, NASA, $55,665; 12/3/2012.

"Space Grant Innovative Pilot Pre-service Educator", PI Angela Des Jardins (MSGC), NASA, $500,000 for two years, 9/1/2013 to 8/31/2015; submitted 12/11/12

"Space Grant Innovative Pilot Undergraduate Retention", PI Angela Des Jardins (MSGC), NASA, $500,000 for two years, 9/1/2013 to 8/31/2015; submitted 12/11/12

“High-Bandwidth Photonic Arbitrary Waveform Generation using Low-Bandwidth Spectral Shaping,” Charles Thiel, PI, SBIR Phase I with S2 Corporation of Bozeman, MT, $48,620; submitted 10/5/2012, for 6 months duration; (funded 1/18/2013).

“High Resolution 3D Laser Imaging via Compressive Range and Cross-Range Sampling,” Randy Babbitt, which is still pending

PROPOSALS FUNDED

“Macroscopic Quantum Communications Using Photonic Qudits,” DARPA program in collaboration with Northwestern University and the University of Calgary; funded for three years, starting November 2012. The group of universities and companies working on this project is led by Professor Prem Kumar, Northwestern University.

“Rotational and Crust Dynamics of Neutron Stars, Bennett Link, National Science Foundation, Amount: $288, 745, Period: 3 years, 9/01/12 – 8/31/15.

“Solar Information Processing Workshop VI: Optimizing the Scientific Return from Petabytes of Data”, Piet Martens, NASA, $17,939, Period: 12 months, 8/14/12 – 8/13/13.

"MSU Contribution to Hinode/XRT Phase E: Mission Operations & Data Analysis--Extended Mission", David E. McKenzie, funded by Smithsonian Astrophysical Observatory; 11/1/2012-10/31/2014: $375k

“Ground-Based Observations Coordinate for RHESSI (Max Millennium Program)”, Dick Canfield, Start Date 10/1/2012, End Date 9/30/3013, amount $25,736.

“Spatial-Spectral Holographic Rainbow Spectrometer for Ultra-Wideband Cueing Receiver”, Randy Babbitt with Spectrum Lab, 12/11/12; $749,995.

"Montana NASA EPSCoR Research Infrastructure Development FY12", Angela Des Jardins PI, NASA, 10/18/12 - 10/17/15, $125,000.

INVITED TALKS

"The Faint Young Sun Paradox: Is There Even Life on Earth?", Piet Martens, at the meeting Life in the Cosmos, Washington DC, September, 2012.

"Exploring Heterogeneous Solar Data", V. Delouille, P.C.H. Martens, Craig DeForest, Ruben De Visscher, Thierry Dudok de Wit, Alexis Rouillard, and the SDO Feature Finding team, "Fifth Solar Orbiter Workshop", September 10-14, 2012 - Brugge, Belgium (presentation by co-author).

"Magnetic Point-Charge Modeling of the Transfer of Energy to, and Storage of Energy in, the Corona", Richard canfield, Invited Keynote talk at Tracing the Connections in Solar Eruptive Events, 27th Nov - 2nd Dec 2012, Petaluma, CA

CONTRIBUTED TALKS

"RBS Investigation of Volatile Gases Produced in Solid Oxide Fuel Cell Systems", C.F. Key, W. Priyantha, J. Regar, H. Chen, J Eziashi, R. J. Smith, P. Gannon, N. Childs, P. Gentile, S. Sofie, 22nd International Conference on Applications of Accelerators in Research and Industry, August, 2012, Ft. Worth, TX.

"Electronic and Ionic conductivity Study of a Sr(2-x)VMoO(6-y) Solid Oxide Fuel Cell Anode (x=0.0, 0.1, 0.2)", N. Childs, A. Weisenstein, C. Key, R. Smith, S. Sofie, 22nd International Conference on Applications of Accelerators in Research and Industry, August, 2012, Ft. Worth, TX.

"Conceptual Demonstration of Hypervelocity Dust Particle Detection", N.B. Childs,A. Shu, A. Collette, K. Drake, M. Horanyi, 22nd International Conference on Applications of Accelerators in Research and Industry, August, 2012, Ft. Worth, TX.

POSTER PRESENTATIONS

"Electrical Conductivity of Sr(2-x)VMoO(6-y)(x=0.0, 0.1, 0.2) Double Perovskite Solid Oxide Fuel Cell Anode", N. Childs, A. Weisenstein, S. Sofie, D. Smith, C. Key, 14th annual Meeting of the APS Northwest Section, October 18-20, 2012, Vancouver, BC.