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# DEPARTMENT OF PHYSICS AND ASTRONOMY

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Vol. XXXII No 5 UNIVERSITY OF KANSAS March 13, 2012

Honors and Awards

Gregory Rudnick was the spring recipient of the 2012 ING Professor of Excellence in Teaching award in the amount of \$1000. The award is granted to one professor on the Lawrence campus and was presented to Gregory on the floor of Allen Fieldhouse during the KU-Oklahoma State Basketball game on Feb. 1st.

Graduate students **Brian Ruzicka**, **Lalani Werake** (now at Intel), and **Guowei Xu**, with Distinguished Professor **Judy Wu** and Assistant Professor **Hui Zhao**, have discovered a new method of using ultrafast laser pulses to detect electrical currents. The research, published in Physical Review Letters, was highlighted by an article in the March issue of Physics Today (Frequency-doubled photons can measure current density, by Steven Blau), and in a KU news release.

Out and About

Prof. **Steve Hawley** gave an invited keynote address entitled "The Challenges and Achievements in 50 Years of Human Spaceflight" at the 219th meeting of the American Astronomical Society in Austin. Prof. Hawley also gave an invited lecture in the 2012 Physics, Math and Engineering Lecture Series at Pittsburg St. University.

Prof. **Hawley** was interviewed about spaceflight programs in development by other nations as part of an article by Neil Degrasse Tyson on the future of spaceflight that appeared in the current edition of Discover magazine. Prof. Hawley also did interviews with KMBZ radio and the Lawrence Journal-World.

Doug McKay spent the month from November 15 to December 15 visiting the Department of Physics at COMSATS Institute of Information Technology, Islamabad Campus, in Pakistan. The trip was sponsored by the Pakistani Higher Education Commission. While working with Prof. Farida Tahir and grad student Amir Nawaz Khan on research into non-standard interactions and neutrino oscillations, giving a series of weekly colloquia on "Neutrino Physics: from energies eV to EeV at COMSATS I.I.T. in Islamabad, video linked to COMSATS Lahore and to Peshawar U., and talking with undergrad and grad students about particles, space, time and all that, he also visited a number of homes and villages in the region surrounding Islamabad. He was nicely sustained by daily Pakistani meals at the Campus Canteen at

lunchtime and at Farida and Tahir's home in the evenings. He's quickly relearned how to eat with knife and fork after a month of eating with fingers.

The *National Center for Supercomputing Applications* (Urbana, IL) has used a narrative of research by **Prof. Melott** in their report for Congress on science that NSF has helped support through their center.

Gregory Rudnick gave a contributed oral presentation at the January American Astronomical Society meeting titled "A Tale of Giants and Dwarfs: How the Red Sequence in Clusters Grew over the last 9.5 Gyr".

Gregory Rudnick gave an invited colloquium at the University of Indiana Astronomy Department on Nov. 29, 2012. The title of his talk was "The Rise of the Dead: How the Passive Galaxy Population Grew over the Last 10 Billion Years".

Prof. **Hui Zhao** spoke at the APS March Meeting 2012 in Boston, on ultrafast laser studies of some atomically-thin molybdenum disulfide samples made by Matt Bellus and Prof. Chiu.

Recent Publications

Abundances in "Green Pea" Star-forming Galaxies, **Steven A. Hawley**, Publications of the Astronomical Society of the Pacific, 124, #911, 21 (2012).

The Engineering, Scientific and Cultural Legacy of the Space Shuttle, **Steven A. Hawley**, in the Proceedings of the Conference: The Space Shuttle -- An Engineering Milestone, Jim Craig editor, Georgia Institute of Technology (2012) (<http://www.ae.gatech.edu/spaceshuttlesymp/>).

Adrian L. Melott, Richard K. Bambach, Kenni D. Petersen, and John M. McArthur, "A ~60 Myr periodicity is common to marine-⁸⁷Sr/⁸⁶Sr, fossil biodiversity, and large-scale sedimentation: what does the periodicity reflect?" *The Journal of Geology* 120, 217-226 (2012). A news release on this from University of Chicago Journals had some national/international coverage.

Adrian Melott, "The Earth Dies Screaming: Radiation Threats from Beyond" *Analog Science Fiction and Fact*, 132, 25-31 (2012).

"Intracluster light in clusters of galaxies at redshifts $0.4 < z < 0.8$ ", Guennou, L., Adami, C., Da Rocha, C., Durret, F., Ulmer, M.-P., Allam, S., Basa, S., Benoist, C., Biviano, A., Clowe, D., Gavazzi, R., Halliday, C., Ilbert, O., Johnston, D., Just, D., Kron, R., Kubo, J.-M., Le Brun, V., Marshall, P., Mazure, A., Murphy, K.-J., Pereira, D.-N.-E., Raba, C.-R., Rostagni, F., **Rudnick, G.**, Russeil, D., Schrabback, T., Slezak, E., Tucker, D., and Zaritsky, D., 2012, *Astronomy and Astrophysics*, 537, pp.A64

Brian A. Ruzicka, Lalani K. Werake, Guowei Xu, Jacob B. Khurgin, E. Ya. Sherman, **Judy Z. Wu**, and **Hui Zhao**, Second-harmonic generation induced by electric currents in GaAs, *Physical Review Letters* 108, 077403 (2012).

Alec Kirkemide, **Brian A. Ruzicka**, **Rui Wang**, Sarah Puna, **Hui Zhao**, and Shenqiang Ren, Synthesis and optoelectronic properties of two-dimensional FeS₂ nanoplates, ACS Applied Materials & Interfaces Article ASAP (2012).

Brian A. Ruzicka and **Hui Zhao**, Optical studies of ballistic currents in semiconductors [invited], Journal of the Optical Society of America B 29, A43 (2012).

Alumni News

Dimitra Atri (Ph.D. 2011) gave a talk “Terrestrial Effects of High Energy Cosmic Rays” at the 6th *Winter Workshop and School on Astroparticle Physics (WAPP 2011)*, Dec 17-19 in Darjeeling, India. Then, Dec 21-29 in the *WAPP 2011* school, he conducted CORSIKA training sessions, and gave lectures on “Extensive Air Shower Simulations with CORSIKA”. On February 11, the *New York Times* news analysis section carried a story including mention of Dimitra and his research—mistakenly calling him a KU professor.

DEPARTMENT NEWSLETTER--CALL FOR ITEMS: Please send your items to Danny Marfatia (marfatia@ku.edu). It's a lot easier to use them if you make them editor-ready: Group them according to the kind of item. Use plain text or Word. Don't number them. Don't say "I visited the Sheboygan Zoo." Use your name (third person). Etc....

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