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## DEPARTMENT OF PHYSICS AND ASTRONOMY

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Vol. XXXIII No 5 UNIVERSITY OF KANSAS November 21, 2014

OUT AND ABOUT

During the Annual Department Picnic (August 23, 2014), several students, staff, faculty and emeriti participated in the Ice Bucket Challenge to benefit the *ALS Association*. The hot temperatures during the afternoon plus the desire to help others drove participants to raise nearly \$300.

A KU press release based on work by the **Chiu** and **Zhao** groups entitled “Research yields material made of single-atom layers that snap together like Legos” made its way also onto the *NSF* research news on the front page of nsf.gov.

Prof. Steve Hawley gave several interviews to regional print and television outlets concerning details of the *ESA Rosetta* mission and the *Philae* landing on comet 67P. He was also part of an invited panel at the 15th anniversary *Chandra X-ray Observatory* science conference on November 18 in Boston.

Prof. Hawley led a successful effort to have KU accepted as a partner institution with the *Astronaut Scholarship Foundation*. The Astronaut Scholarship Foundation was established by the Mercury 7 astronauts as a way to identify and enable students who have the potential to be tomorrow's leaders in science and technology. As a partner institution, KU will be able to award 2 \$10,000 scholarships per year to juniors and seniors in science, engineering, and mathematics. The first two KU Astronaut Scholars will be selected by the ASF in April.

Prof. Kong gave a plenary talk "Looking for Resonances under the LHC Lamppost" at a workshop organized by *TRIUMF* and *Perimeter Institute*, Canada.

“Ionizing Radiation Threats to the Earth” was presented by **Adrian Melott** at the *Computational and Applied Mathematics Seminar*, KU Department of Mathematics, October 29, 2014. **Prof Melott** was interviewed for an *American Physical Society* Spotlight news item regarding “Possible Role of Gamma Ray Bursts on Life Extinction in

the Universe” <http://physics.aps.org/articles/v7/12>, based on a *Phys Rev Lett* paper by Piran and Jimenez.

Congratulations to **Gopolang Mohlabeng**, a high energy theory student, who successfully finished his comprehensive exam with honors.

"What is the actual size of the proton?" presented by **John P. Ralston**, in *Workshop on Forward Physics*, Lawrence and Kansas City, September 4, 2014

Gregory Rudnick gave a contributed talk at the conference *Evolving Galaxies in Evolving Environments* in Bologna Italy. He also gave *Science on Tap* presentations in Lawrence in September and in Topeka in October. The *Nature Communications* paper (see below) was covered on a variety of science news websites, including *National Geographic* as "Giant Blast Shuts Down Starburst Galaxy".

RECENT PUBLICATIONS

"Bounds on dark matter interpretation of Fermi-LAT GeV excess" **Kyoungchul Kong** and **Jong-Chul Park**, *Nucl.Phys.* B888 (2014) 154-168

"Optimizing the determination of the neutrino mixing angle θ_{13} from reactor data", Amir N. Khan, **Douglas W. McKay** and **John P. Ralston**, *International Journal of Modern Physics A*, 29, No. 20, 1450109 (2014).

"Short baseline reactor anti-electron-neutrino - electron scattering experiments and nonstandard neutrino interactions at source and detector", Amir N. Khan, **Douglas W. McKay** and F. Tahir, *Physical Review D* 90, 053008 (2014).

"Has the Earth been exposed to numerous supernovae within the last 300 kyr?" (**A.L. Melott**, I.G. Usoskin, G.A. Kovaltsov, and C.M. Laird) *International Journal of Astrobiology*, available on CJO2014. doi:10.1017/S1473550414000512 (2014).

Sumeet K. Dagaonkar, Pankaj Jain, and **John P. Ralston** "Uncovering the scaling laws of hard exclusive hadronic processes in a comprehensive endpoint model", *European Physical Journal C* 74, 3000 (2014).

"Stellar feedback as the origin of an extended molecular outflow in a starburst galaxy", *Nature* 516; issue 7529; pp 68-70. Geach, Hickox, Diamond-Stanic, Krips, **Rudnick**, Tremonti, Sell, Coil, & Moustakas (2014)

Jiaqi He, **Nardeep Kumar**, **Matthew Z. Bellus**, **Hsin-Ying Chiu**, Dawei He, Yongsheng Wang, and **Hui Zhao**, *Nature Communications* 5, 5622 (2014).

Frank Ceballos, Matthew Z. Bellus, Hsin-Ying Chiu, and Hui Zhao, Ultrafast Charge Separation and Indirect Exciton Formation in a MoS₂-MoSe₂ van der Waals Heterostructure, *ACS Nano* 10.1021/nn505736z (2014).

Nardeep Kumar, Jiaqi He, Dawei He, Yongsheng Wang, and **Hui Zhao**, Valley and Spin Dynamics in MoSe₂ Two-Dimensional Crystals, *Nanoscale* 6, 12690 (2014).

Keliang He, **Nardeep Kumar**, Liang Zhao, Zefang Wang, Kin Fai Mak , **Hui Zhao**, and Jie Shan, "Tightly Bound Excitons in Monolayer WSe₂", *Physical Review Letters* 113, 026803 (2014).

DEPARTMENT NEWSLETTER--CALL FOR ITEMS: Please send your items to Adrian Melott (melott@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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