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DEPARTMENT OF PHYSICS AND ASTRONOMY

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OUT AND ABOUT

A research result on quantum transport of electrons in van der Waals trilayers by **Frank Ceballos** and colleagues was featured on the front page of NSF.gov, Daily Mail (UK) and a KU news release.

Prof. Hume Feldman was on a three week visit to the Institute for Astronomy at the University of Hawaii in Honolulu in December-January. He gave a talk titled "Funny Thing Happened on the Way to Convergence: The Cosmic Velocity Field." He also visited the Mauna Kea Observatories on the Big Island of Hawaii.

Ian Lewis gave an invited talk "Higgs Physics in the Singlet Extended Standard Model" at Loopfest XV at the *University of Buffalo* in August and gave a talk "Fun With Singlets" at the workshop "Understanding the First Results from LHC Run II" at *the Mainz Institute for Theoretical Physics* in July, and a colloquium at the *Math Department* "The Higgs Boson as a Probe of New Physics" in December. Also, he gave seminars "New Physics in Double Higgs Production" at *Minnesota* in December and "Double Scalar Production at the LHC and Beyond" at *Fermilab* in March.

A.L. Melott, "A Supernova at 150 Light Years: What Happened to the Earth?" Public Lecture March 9, *Lawrence Public Library*.

Michael Murray gave a talk about CMS photon - nucleus results at *the Institute for Nuclear Theory* in Seattle. The workshop was focussed on using photons produced in very high energy nuclear collisions to study the high energy limit of the strong nuclear force. While in Seattle Professor Murray also visit the Physics Education Group at the *University of Washington* and got to observe their teaching and interact with their faculty. Professor Murray also attended several workshops preparing for a new Electron Ion Collider at Pacific Northwest National Lab, Argon National Lab and Stony Brook University.

Theory student **Gopolang Mohlabeng** has accepted a position as a research associate at the high energy theory group at *Brookhaven National Laboratory* this fall.

Jeong Han Kim, a postdoc in high energy theory group, gave a seminar at the *University of Florida* in January. His title was "Prospects for measuring the form of the Higgs potential at a future 100 TeV proton-proton collider".

Prof. Kong gave lectures on LHC physics at *Harish Chandra Institute* (Feb 4-17, 2017). He was invited to 6th grade science class at *Ingomar Middle School*, Pittsburgh, PA and gave three lectures on "What is the Universe Made of?" (December 22, 2016). He was also invited for a colloquium entitled by "Searches for New Physics at the LHC Run II" at the *University of Texas, Arlington*, (December 7, 2016).

On January 2 **John Ralston** presented a talk "How Fundamental are YOUR constants?" at the *APS* conference on hadronic physics, GHP2017 held in Washington DC. On February 15 he gave an invited talk on "Applied Quantum Tomography" at the workshop "Probing QCD in Photon-Nucleus Interactions at RHIC and LHC" held at the Institute of Nuclear Theory at the *University of Washington* in Seattle. KU theory graduate student **John Martens** also attended the meeting.

HONORS AND AWARDS

Graduate student **Matt Sullivan** received a DOE Office of Science Graduate Student Research Program award. This was a competitive award that provides funding to work with a DOE laboratory scientist. The competition was across all DOE lab disciplines and involved writing a proposal in conjunction with a lab scientist. Matt's proposal was entitled "Baryogenesis at the Large Hadron Collider" and he will be working with Sally Dawson at *Brookhaven National Laboratory* this August through December.

NEW FUNDING

RECENT PUBLICATIONS

T. Wang, T. R. Kafle, B. Kattel, & W. -L. Chan, "A Multidimensional View of Charge Transfer Excitons at Organic Donor-Acceptor Interfaces" *J. Am. Chem. Soc.* 139, 4098-4106 (2017).

Biancardi, **C. Caraiani, W. -L. Chan**, & M. Caricato, "How Number of Layers and Relative Position Modulate the Interlayer Electron Transfer in π -Staked 2D Materials" *J. Phys. Chem. Lett.* 8, 1365-1370 (2017)

"Identifying a new particle with jet substructures" Sung Hak Lim, Chengcheng Han, Doojin Kim, Minho Kim, **Kyoungchul Kong**, Myeonghun Park, *JHEP* 1701 (2017) 027

"A Possible Role for Stochastic Astrophysical Ionizing Radiation Events in the Systematic Disparity between Molecular and Fossil Dates" **A. L. Melott**, *Astrobiology*. January 2017, 17(1): 87-90. doi:10.1089/ast.2016.1527.

“Does the Planetary Dynamo Go Cycling On? Re-examining the Evidence for Cycles in Magnetic Reversal Rate” (**A.L. Melott**, A. Pivarunas, J.G. Meert, and B.S. Lieberman). *International Journal of Astrobiology*, 2017 <https://doi.org/10.1017/S1473550417000040>

“Multi-component Dark Matter through a Radiative Higgs Portal” Anthony DiFranzo, **Gopolang Mohlabeng**, *JHEP* 1701 (2017) 080

Matthew Z. Bellus, Zhibin Yang, Jianhua Hao, Shu Ping Lau, and **Hui Zhao**, Amorphous Two-Dimensional Black Phosphorus with Exceptional Photocarrier Transport Properties, *2D Materials* 4, 025063 (2017).

Frank Ceballos, Ming-Gang Ju, **Samuel D. Lane**, Xiao Cheng Zeng, and **Hui Zhao**, Highly Efficient and Anomalous Charge Transfer in van der Waals Trilayer Semiconductors, *Nano Letters* 17, 1623-1628 (2017).

Shudi Pan, **Frank Ceballos**, **Matthew Z. Bellus**, **Peymon Zereshki**, and **Hui Zhao**, Ultrafast Charge Transfer Between MoTe₂ and MoS₂ Monolayers, *2D Materials* 4, 015033 (2016).

Frank Ceballos and **Hui Zhao**, Ultrafast Laser Spectroscopy of Two-Dimensional Materials Beyond Graphene (**Feature Article**), *Advanced Functional Materials*, DOI: 10.1002/adfm.201604509 (2016).

Matthew Z. Bellus, Ming Li, **Samuel D. Lane**, **Frank Ceballos**, **Qiannan Cui**, Xiao Cheng Zeng, and **Hui Zhao**, Type-I van der Waals heterostructure Formed by MoS₂ and ReS₂ Monolayers, *Nanoscale Horizons (Cover Story)* 2, 31-36 (2017).

ALUMNI NEWS

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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