



PHYSICS & ASTRONOMY NEWS LETTER

UNIVERSITY OF KANSAS



OUT AND ABOUT

1. News from Department Banquet (May 4, 2018)

• **Congratulations to the following students who graduated in the Spring of 2018**

Physics BS: Mario Malcazar (with honor), Jamey Ballard, Cameron Buster, Carin Gavin, Eilish Gibson, Jazmine Jefferson, Alex Kolomaya, Grayson Langham, Marcus Pepperdine, Trevor Scheopner, Sierra Seacat, and Quade Woofter; **Astronomy BS or BA:** Carin Gavin, Hannah Gibson (with honors), and Ludwig Johanning; **Physics or Astronomy Minor:** Carrie Albers and Samantha Sosa; **Ph.D. Recipients:** Matt Bellus.

• **Congratulations to the following undergraduate students who received scholarships, fellowships and awards in the past year**

Astronaut Scholarship Foundation: Eilish Gibson; **Badgley Award:** Afnan Elhamshari and Carin Gavin; **Emerging Scholars:** Melissa King; **Feaster Award:** Jonathan Bush (for 2017), Zachary Olson (for 2017), and C.W. Robertson (for 2018); **Benjamin A. Gilman International Scholar:** Anastasiya Skvortsova; **Goldwater Fellowship:** Eilish Gibson; **Johnson Scholarship:** Hannah Gibson and C.W. Robertson; **Second Place Team in Kansas Collegiate Math Competition:** Trevor Scheopner (Physics and Math), Andrei Elliott (Computer Science), and Andrew Johnston (Aerospace Engineering); **First Place (Senior Level) in KU Math Prize Competition:** Trevor Scheopner; **KU Nominee for Marshall Scholarship:** Eilish Gibson; **Mathematical Association of America’s William Lowell Putnam Mathematical Competition:** Trevor Scheopner is highest scoring student from KU, ranking in the top 500 out of 4164 participants and also placed 54th out of 415 teams as a member of the KU Team; **Phi Beta Kappa, KU Alpha Chapter:** Mario Balcazar, Clara Bernauer, Eilish Gibson, Dalton Jorns, and Anneliese Reinert; **Phi Kappa Phi:** Thomas Gartman, Hannah Gibson, and C.W. Robertson; **Prosser Award:** Grant Daugherty, Collin Edwards, and Thomas Gartman; **KU Nominee for Rhodes Scholarship:** Eilish Gibson; **SELF Program:** Ashley Allen, Ryan Alvarez, and Austin Irvine; **Sigma Pi Sigma New Inductees:** Mario Balcazar, Pierce Giffin, Zachary Olson, Taylor Plattner, C.W. Robertson, Arthur Vollbrecht, and Thomas Woodruff; **Stranathan Award:** Mario Balcazar and Trevor Scheopner; **Talty Scholarship:** John Pace; **Undergraduate Research Awards:** Mario Balcazar (Spring 2018); **Research Experiences for REU Program Awards (2018):** Grayson Petter, Taylor Plattner, and C.W. Robertson.

- **Congratulations to the following graduate students who received scholarships, fellowships and awards in the past year**

Argonne National Laboratory Summer Fellowship: Nesar Ramachandra; **DOE Office of Science Graduate Student Research Program Fellowship:** Steven Prohira (for Spring 2018) and Matt Sullivan (for Fall 2017); **KU First-Year Graduate Fellowship:** Tommaso Isidori; **KU Graduate Research Competition Award:** Sinan Deger and Peymon Zereshki; **Kansas Academy of Sciences-Best Student Talk at Annual Meeting:** Cristian Baldenegro Barrera; **Madison and Lila Self Graduate Fellowship Award:** Jennifer Cooper (for 2017-2021), Samuel Lane (for 2015-2019), Justin Williams (for 2016-2020); **Nason/KU Field Station Student Research Award:** Steven Prohira; **Physics & Astronomy Department Scholarship:** Nesar Ramachandra; **Redeker Graduate Scholarship:** Brent Cook; **Graduate Student and Post-Doctoral Travel Award:** Shekhar Adhikari, Haider Alhazmi, Jeong Han Kim, and Matt Sullivan; **DOD Science, Mathematics, Research and Transformation Scholarship:** James Bowen; **KU Summer Research Fellowship:** Donald Lee-Brown (for 2017) and Bhupal Kattel (for 2018); **Department Summer Research Fellowship:** Jack King (for 2017), Mindy Townsend (for 2017) and Suman Dhamala (for 2018), Tommaso Isidori (for 2018); **KU Argersinger Dissertation Award:** Gopolang Mohlabeng (for 2018).

- **Department Teaching Award**

E.E. Slossen Award For Outstanding Graduate Teaching Assistants: Aaron Morgan, Tony Renzaglia, and Yuyu Wang; **Department Graduate Teacher of the Year:** Prof. Jack Shi; **Department Undergraduate Teacher of the Year:** Prof. Chris Rogan.

- **Faculty Honors**

APS Brazil-US Professorship/Lectureship Program Award: Christophe Royon; **John C. Wright/Byron A. Alexander Outstanding Graduate Mentor Award:** Hui Zhao; **Outstanding Referee of the Physical Review Journals:** Siyuan Han; **CLAS Research Excellence Initiative – Conference/Meeting/Exhibit Sponsorship Award:** Ian Lewis

2. Faculty in the News

- Prof. G. Wilson, as shown in the picture, attended a conference about the International Linear Collider (ILC) proposed to be built in Japan. As reported by Physics Today recently, there are renewed pushes from international scientific communities as well as politicians in Japan to make the ILC into a reality. The latest proposal is a phased approach of the ILC, starting as a Higgs factory at 250 GeV (instead of 500 GeV). This scaled-down ILC was approved by the Japan Association of High Energy Physicists last summer and endorsed by the International Committee for Future Accelerators (ICFA). Currently about a quarter of the Diet, Japan's parliament, supports building the ILC in Japan.



- The two Journal of Geology publications listed below for Prof. Melott were, within a week of their posting online the most viewed and the most reported online of any publications within the history of that University of Chicago journal (founded in 1895).
- On February 20, the Lawrence City Commission voted 5-0 in favor of lowering the color temperature of future street light installations in the city of Lawrence, completing a major objective of the lobbying campaign initiated last summer by Prof. Melott. It is remarkable that this was accomplished despite the continual opposition of Westar Energy and city staff.

3. Activities on Conferences, Workshops, Colloquia and Seminars

- In December 2017, Prof. C. Royon was the convener of the diffraction and low x session at the MultiParticle Interaction Conference in India and presented the CT-PPS physics results on behalf of CMS and TOTEM. He also gave a seminar at the Institute of Nuclear Physics, Cracow, Poland. In January 2018, he gave an invited talk about “anomalous coupling studies at the LHC” at the HEP 2017 conference in Vina del Mar, Chile. In March 2018, Prof Royon presented “Forward Physics with tagged protons at the LHC” at the LHC Forward Physics Workshop, in Madrid, Spain. In the Workshop, Justin Williams and Tim Raben also presented CT-PPS physics results and Jet gap jet BFKL NLL calculations, respectively.
- Prof. I. Lewis, Dr. J.H. Kim (postdoc), and Matt Sullivan (graduate student) attended the Brookhaven Forum (BF2017): In Search of New Paradigms in October, 2017 and gave talks “Double Gauge Boson Production in the SM EFT”, “Loop-induced Single Top Partner Production at the LHC”, and “Double Higgs Production in the Singlet Extended Standard Model”, respectively. In Feb. 2018, Prof. Lewis gave an invited talk “Introduction to EFT” at “Probing Physics Beyond the Standard Model With Precision” held in Mainz, Germany. He also participated in our dark matter day public talk “Spooky Dark Matter: The ghostly stuff that binds the Universe,” along with Profs. C. Rogan and G. Rudnick. Matt Sullivan also gave a talk “Di-Higgs in singlet extensions” at the HL/HE-LHC Meeting at Fermilab in April, 2018.

Prof. Lewis received a \$1000 Research Excellence Initiative award from CLAS. This is to hold a regional workshop “Particle Physics on the Plains 2018.” The workshop will be held Oct. 13-14, and is a continuation of a workshop we held Sept. 30, 2017. Last time we have around 40 participants from 8 regional institutions: University of South Dakota, University of Nebraska, Kansas State University, University of Kansas, Washington University in St. Louis, Wichita State University, University of Oklahoma, and Oklahoma State University.

RECENT PUBLICATIONS (names in **bold** font are of our dept.)

1. **A.L. Melott** and B.C. Thomas, “Terrestrial effects of moderately nearby supernovae”, Lethaia, online ahead of print (2018) DOI: 10.1111/let.12256
2. Wendy S. Wolbach, Joanne P. Ballard, Paul A. Mayewski, Victor Adedeji, Ted E. Bunch, Richard B. Firestone, Timothy A. French, George A. Howard, Isabel Israde-Alcantara, John R. Johnson, David Kimbel, Charles R. Kinzie, Andrei Kurbatov, Gunther K. Kletetschka, Malcolm A. LeCompte, William C. Mahaney, **Adrian L. Melott**, Abigail Maiorana-Boutillier,

- Siddhartha Mitra, Christopher R. Moore, William M. Napier, Jennifer Parlier, Kenneth B. Tankersley, Brian C. Thomas, James H. Wittke, Allen West, James P. Kennett, “Extraordinary biomass-burning episode and impact winter triggered by the Younger Dryas cosmic impact $\sim 12,800$ years ago; Part 1: Ice cores and glaciers”, *Journal of Geology*, (2018) <https://doi.org/10.1086/695703>
3. Wendy S. Wolbach, Joanne P. Ballard, Paul A. Mayewski, Andrew C. Parnell, Niamh Cahill, Victor Adedeji, Ted E. Bunch, Gabriela Domnguez-Vzquez, Jon M. Erlandson, Richard B. Firestone, Timothy A. French, George Howard, Isabel Israde-Alcantara, John R. Johnson, David Kimbel, Charles R. Kinzie, Andrei Kurbatov, Gnther K. Kletetschka, Malcolm A. LeCompte, William C. Mahaney, **Adrian L. Melott**, Siddhartha Mitra, Abigail Maiorana-Boutillier, Christopher R. Moore, William M. Napier, Jennifer Parlier, Kenneth B. Tankersley, Brian C. Thomas, James H. Wittke, Allen West, James P. Kennett, “Extraordinary biomass-burning episode and impact winter triggered by the Younger Dryas cosmic impact $\sim 12,800$ years ago; Part 2: Lake, marine, and terrestrial sediments”, *Journal of Geology*, (2018) <https://doi.org/10.1086/695704>
 4. **A.L. Melott**, “How supernovae have affected life”, *Astronomy* 46 (4), 44 (April, 2018).
 5. Dawson, S and **Sullivan, M**, ”Enhanced di-Higgs boson production in the complex Higgs singlet model,” *Phys. Rev.* **D97** (2018) no.1, 015022.
 6. **S. Prohira**, S. Kunwar, K. Ratzlaff, R. Young, **D. Besson**, “Implementation of a custom time-domain firmware trigger for RADAR-based cosmic ray detection”, *Nucl. Instrum. Meth.* **A890** 126 (2018).

Alumni News

Brian Thomas (PhD 2005) has been named Washburn University College of Arts and Sciences Distinguished Faculty Lecturer.

DEPARTMENT NEWSLETTER – CALL FOR ITEMS:

Please send your items to Jack Shi (jshi@ku.edu). It’s a lot easier to use them if you make them editor-ready: Group them according to the kind of item. Don’t say “I visited the Sheboygan Zoo.” Use your name (third person). For names in publications, please highlight the ones from our dept.

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