

WINTER 2015/16

DR. IAN LEWIS: NEW FACULTY ENHANCE THEORY GROUP



Department of Physics & Astronomy

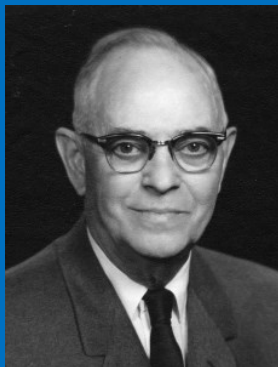


Inside this issue:

RESEARCH NEWS	2
AWARDS and HONORS	3
From the Chair	4



We are pleased to welcome **Dr. Ian Lewis**, who joined the Department of Physics and Astronomy as an Assistant Professor in January 2016. Dr. Lewis received his BS in Physics from KU in 2005 and his Ph.D. in 2011 from the University of Madison-Wisconsin, followed by three years as a postdoc at Brookhaven National Laboratory, then one and a half years at SLAC National Accelerator Laboratory. His main interests are in physics at high energy colliders. His previous research has been particularly focused on the Higgs boson and new physics at hadron colliders. Over the next few years he plans on continuing this vein of research; particularly on the Higgs boson and associated processes, and generally on signatures of new physics models at the Large Hadron Collider (LHC) and possible future colliders. While the Standard Model of particle physics has been a great triumph for high energy physics, it is hoped that new physics may yet be directly discovered. His goals are to help facilitate the discovery of new physics and understanding of LHC data. This involves precision predictions of Standard Model physics, to make sure we understand it and its implications, followed by searches for new physics and interpretation of any possible signal that may be found. Both precision calculations and new physics searches are need to make sure we fully understand the data of the LHC and that it is not misinterpreted. In particular, since the Higgs boson is the newest discovered particle and central to the Standard Model, understanding and measuring its properties are a high priority.

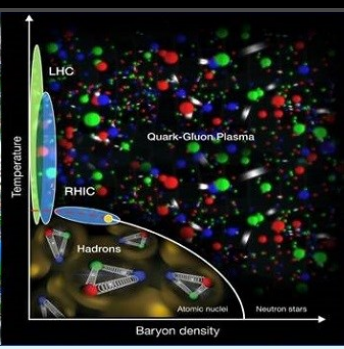
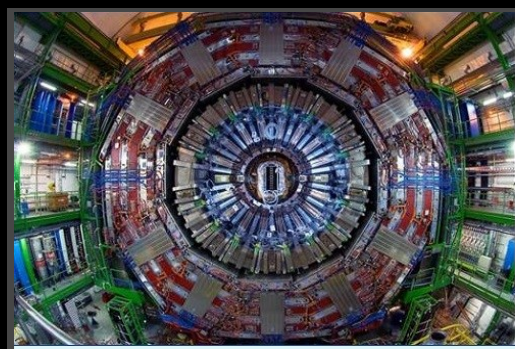


Gift Creates Professorship to Educate Physicists

Ernest D. Klema ventured into Ivy League halls and the labs of Los Alamos during his academic and professional career, but his roots were planted at the University of Kansas. Klema, who died in 2008, made a \$1.8 million estate gift to establish a professorship in physics at KU. The gift to KU Endowment, from the estate of Klema and his wife, Virginia Klema, who died in 2015, will create the **J.D. Stranathan Professorship of Experimental Physics** in the College of Liberal Arts & Sciences. Experimental physics plays an essential role in the development of scientific explanation of natural phenomena, specifically to test theories and provide the basis for scientific knowledge. Both Ernest and Virginia Klema had illustrious academic careers. Virginia Klema was a principal research scientist at Massachusetts Institute of Technology. Ernest Klema was born in Wilson. He earned a bachelor's degree from the College of Liberal Arts & Sciences in 1941. He then went on to receive a master's degree in physics from the university in 1942. During his academic career, he was a Summerfield Scholar and a member of Phi Beta Kappa Honor Society. The professorship carries the name of J.D. Stranathan, a KU professor and chair in the Department of Physics, who retired in 1969. Stranathan earned both his bachelor's and master's degrees at KU in 1921 and 1924 respectively, and his doctorate at the University of Chicago in 1928. He joined the faculty at KU in 1920, and Klema studied under him as a graduate student.

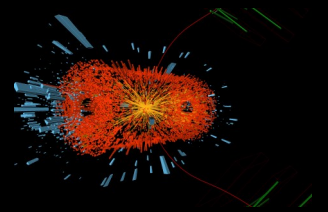


RESEARCH NEWS



‘Littlest’ Quark-Gluon Plasma Revealed by Physicists Using Large Hadron Collider

Researchers at KU working with an international team at the Large Hadron Collider have produced quark-gluon plasma—a state of matter thought to have existed right at the birth of the universe - with fewer particles than previously thought possible. The material was discovered by colliding protons with lead nuclei at high energy inside the supercollider’s Compact Muon Solenoid detector. Physicists have dubbed the resulting plasma the “littlest liquid.” For the full story, follow [this link](#).



Factoring for Cosmic Radiation Could Help Set a More Accurate Molecular Clock

Since the 1960s, scientists have theorized the number of molecular differences in DNA, RNA and proteins from related species could pinpoint the time of their genetic divergence. Accordingly, a higher number of molecular differences indicates a greater number of years since any two species’ split from a common ancestor. In a recent paper, **Prof. Adrian Melott** examined a major hiccup in the molecular clock theory. The problem is that fossil evidence doesn’t always sync with molecular dating for a variety of species.. Melott concludes that there may be an astrophysical explanation for conflict between the molecular clock and the fossil record. For the full story, follow [this link](#).



And Now for Something Totally Different! KU Prof Discusses the Impact of a Nearby Supernova

While most of us worry about the more mundane ways of leaving this world, like car accidents and disease, things we can at least attempt to control, others focus on the big picture, the events no one is immune to. As part of his ongoing research into extraterrestrial sources of planetary extinction, **Prof. Melott** recently discussed his work as part of an story for Atlantic magazine, particularly the impact of having a stellar supernova go off nearby. If you are looking for something else to keep you awake at night, follow [this link](#) to the full article.

the Atlantic

AWARDS and HONORS

Dark Matter Research Earns PhD Student Fermilab Fellowship

Gopolang Mohlabeng, a Fulbright Fellow from South Africa who came to KU to pursue a PhD in physics,

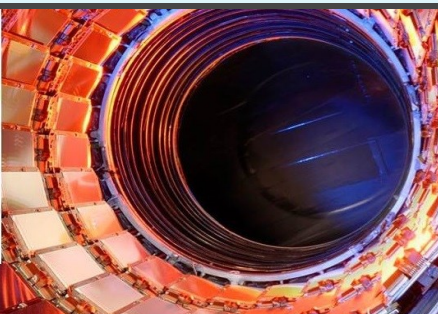
has earned the Fermilab Graduate Student Fellowship in Theoretical Physics. For U.S. students in the research phase of graduate study in theoretical particle physics or theoretical astrophysics, the program provides a stipend, travel allowance and tuition support. In August Mohlabeng will begin a year-long residence at Fermilab. For the full story, follow [this link](#).



SMART

SCIENCE, MATHEMATICS & RESEARCH FOR TRANSFORMATION

PART OF THE NATIONAL DEFENSE EDUCATION PROGRAM



DoD Awards Fellowship to Physics & Astronomy Grad Student

James Bowen, doctoral candidate in the Department of Physics & Astronomy, received a Science,

Mathematics, Research, and Transformation Scholarship. The award covers tuition and other education expenses and provides an annual stipend of \$38,000 from August 2015 to May 2017. After graduation, he will work for two years in the U.S. Naval Oceanographic Office at the John C. Stennis Space Center. Bowen is doing research in experimental high-energy nuclear physics under Michael Murray, professor of physics. He is currently in residence in Switzerland at CERN. For the full story, follow [this link](#).



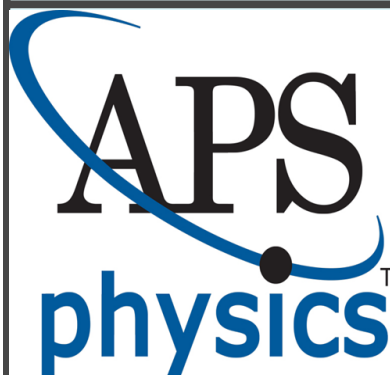
UKanTeach

THE UNIVERSITY OF KANSAS

Engineering Physics Senior Wins UKanTeach Scholarship

Apple co-founder Steve Wozniak and his wife, Janet,

awarded \$5,000 scholarships to six students from the schools of Business, Engineering and Education at a ceremony at the Lied Center. **Brandon Huddleston**, a senior engineering physics student earning a high school physics teaching licensure through KU's UKanTeach program, received the UKanTeach for School of Engineering Award. For the full story, follow [this link](#).

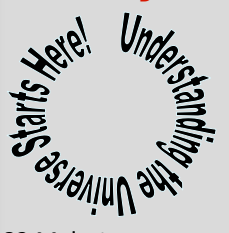


Department Alumnus Named Woman Physicist of the Month by the American Physical Society

Congratulations to **Connie Wells** (MS Physics 2000) August 2015 Selectee for the *Woman Physicist of the Month* by the Committee on the Status of Women in Physics of the American Physical Society. Connie Wells has a M.S. Degree in Physics from The University of Kansas and has been an AP Physics teacher since 1991 at Pembroke Hill School in Kansas City, Missouri. For the full story, follow [this link](#).



Department of Physics & Astronomy



1082 Malott
1251 Wescoe Hall Dr.
Lawrence, KS 66045-7582

Email: Physics@ku.edu
PH: 785-864-4626



From the Chair

Every new semester brings change and challenge, accompanied by the sincere hope that the Department will successfully embrace both and emerge stronger for it. Following on the heels of the largest, single donation ever made to the Department in Fall 2013 to establish the **Feaster Scholarship** for undergraduates, a new record was set in Fall 2015 by a bequest from the estate of Drs. Ernest and Virginia Klema. The \$1.8 million donation will create the **Stranathan Professorship in Experimental Physics** (see pg. 1 for details). The amount of the bequest aside, the value of contributions of this nature cannot be overestimated. The Department currently has two Distinguished Professors, Dr. Judy Wu and, most recently, Dr. Christophe Royon, University Foundation Professor, who joined the faculty in January 2016. Two named professorships in an exceptionally active Department of over two dozen faculty at a major research university is well below average. Moreover, the appointments are ephemeral; they are tied to the individual rather than the Department. As distinguished faculty move or retire, the benefits of the honor to the Department leave with them. With the Stranathan Professorship, the selection of the recipient and the resources that accompany it remain in-house, determined by the needs and wishes of the program rather than external pressures unrelated to Physics and Astronomy. We are extraordinarily grateful to the late Dr. Klema for his generosity in remembering his alma mater over 70 years after completing his education at KU. It should be emphasized that Dr. Klema's feelings toward KU were not all positive. His selection of Dr. Stranathan to honor with the named professorship came from the dominating influence this former

chair had on students and faculty during his tenure at KU, but also the frustration Dr. Klema and his classmates had with the University administration for their failure to support experimental physics at KU. As reported in my last column in Summer 2015, the Lawrence Journal-World published a [story](#) on the attempts by [Dr. H.H. Barschall](#) to get KU to allow him to join the Manhattan Project. Though eventually successful, Dr. Barschall was so disenchanted with his treatment by KU that he spurned the offer of a faculty position after the war, stating "my experiences at Kansas in the months before my departure had left an unpleasant memory. The lack of experimental facilities and the lack of a research tradition were other disincentives." Ironically, two students of Dr. Barschall who went on to distinguished careers were [Worth Seagondollar](#) and Ernest Klema.

Another illustration of the value of such internal resources is supplied by the ongoing budgetary woes of the state of Kansas. Despite regular cuts in the state budget and the reallocation of funds to cover growing deficits, state revenue for February fell \$54 million below already reduced projections. As of March 1, KU has been tagged with a requirement to cut \$7.2 million from its budget for the remainder of the fiscal year, over the next 4 months. This makes the somewhat improbable assumption that the state will meet revenue projections for the remainder of the fiscal year. How this impacts the program will emerge over the next six months and I will do my best to keep alumni informed. Bottom line: your support is needed and appreciated more than ever. Another active semester of talks and news media interactions is summarized in the collage of announcements and posters constructed below. If you'd like to see the **Gravitational Waves** talk, checkout our YouTube link [PUB-LIC LECTURES](#) on the Department web page!

