Cava Delivers 2018 Boussert Lecture

Robert J. Cava, the Russell Wellman Moore Professor of Chemistry at Princeton University, visited LSU on Friday, October 5th to meet with faculty and students and to deliver the 2018 Benjamin Pierre Boussert Lecture. The lecture series is sponsored by family and friends of the late Ben Boussert and seeks to make scientific and personal connections with Ben’s career that was cut short by a fiery automobile accident in 2005.

Professor Cava delivered his lecture titled, “Superconductors: where we are and where we are going,” with the perspective that only he could, given his seminal contributions over the past four decades. The talk commenced with Onne’s discovery of the superconductivity of mercury in 1911. Superconductors transmit electric current at cryogenic temperatures, with zero energy loss. Cava relayed the milestones and described the “players” and their discoveries. A consummate storyteller, he brought us up to the current day and the challenges that face materials scientists in the 21st century.

In addition to the regular crowd from Chemistry, the lecture was well attended by Physics and Chemical Engineering faculty and students. Special guests included Christian and Anne Boussert, Joel, Kelly, Margot, Eleanor and Josephine Boussert, Mary and Bob Harper, John and Jill Smitherman, CJ and Ben Dubois, Christine Mchiel and Steve Damo (and their children Ben and Rose) and Mary Ann Caffery. The lecture was followed by a reception in the Boussert Conference Room. The Bousserts hosted a dinner at Jubans in the evening. A native of New York, Cava had some trepidation about a swamp tour on Saturday morning, but reported after-the-fact that it was great, describing the tour guide as “a senior professor of the swamp.”

Left to right: Carol Taylor, Christian Boussert, Bob Cava, Anne Boussert, Mike Cherry. Photo credit: Vickie Thornton
James William Robinson was born in Kidderminster, England. He attended high school at the King Charles I Grammar School, endowed by Thomas Blount in 1566 “for the instruction of youth in good letters and manners.” Jim was proud to be the first alumnus of King Charles I to receive a PhD. He was an honorary life member of the Old Carolians Association for former pupils of King Charles I. He served in the British Royal Airforce as a pilot during World War II. He earned his degrees in Chemistry from the University of Birmingham, England: Bachelor of Science with Honours (1949), Doctor of Philosophy (1952) and Doctor of Science (1978). He began his career with the British Civil Service as a Senior Scientific Officer.

In 1955, he came to the USA to spend a year as a Research Associate at LSU, in association with Boyd Professor Phillip West. He was accompanied by Winnie, the love of his life and wife for more than 65 years, and their three children, “Little Jim,” Linda and Sandra. They were enamored by the land of opportunity and decided to immigrate, with “Big Jim” serving as a scientist at Esso and Ethyl Corporations during the 1956-64 period.

In 1964, Jim Robinson returned to LSU as an Associate Professor. He became a US citizen in 1965 and was promoted to Professor in 1966, formally retiring as Professor Emeritus in 1993. Jim was a huge fan of LSU Football, having been a season ticket-holder since 1956. Jim and Winnie were very active in their community, as members of the Cosmopolitan Dance Club and longtime supporters and benefactors of the Baton Rouge Symphony, the LSU Music School and the Theater Baton Rouge. Their house on the lake was the scene for many social gatherings of faculty in the 1960s and 70s. Klaus Fischer recalls, “He and his wife Winnie were great hosts. In old British tradition, Jim was also a great storyteller.”

Professor Jim Robinson literally wrote the book on instrumental analysis. “Undergraduate Instrumental Analysis” was translated into Japanese, Spanish and Chinese. The seventh edition was published in 2014, with former students George M. Frame II and Eileen M. Skelly Frame as co-authors. Other monographs included the “Practical Handbook of Spectroscopy” and “Atomic Absorption Spectroscopy.” He was also the editor of the multi-volume series “Handbook of Spectroscopy.” At various times, he served editorial roles with “Spectroscopy Letters,” the “International Journal of Environmental Science and Health,” “Spectroscopy Reviews,” the “Journal of Applied Spectroscopy,” “Analysis of Environmental Control,” and “Analytica Chimica Acta.”

Robinson brought perspective to these books and journals through his experience and expertise as a research scientist in industry and academia. He was a pioneer in analytical chemistry and atomic spectroscopy. He published 207 peer-reviewed manuscripts and mentored 45 graduate students. He was particularly proud of:

- the development of a remote detection method for nerve gas used by the military;
- the introduction of laser fluorescence in hospitals;
- the development of atomic absorption procedures to measure the concentration of lead in air pollution, leading to laws banning lead in gasoline;
- demonstrating the presence of cadmium atoms in solar wind using moon dust;
- data on acid rain that prompted the EPA to place further restrictions on SO2 and SO3 emissions; and
- the characterization of human atherosclerotic plaques that contribute to heart disease.

Professor Robinson was recognized in many ways over the years, including Fellowship of the Royal Society of Chemistry, the American Institute of Chemistry’s Honor Scroll, a Guggenheim Fellowship, the Gold Medal Award of the New York Section of the Society of Applied Spectroscopy and induction into the LSU College of Science Hall of Distinction in 2011.

Until late summer 2018, Jim continued to drive, keep the company of his friend Doreen, and maintain an office on the fourth floor of Choppin Hall. He came into the Department on an almost daily basis, visiting Attres and others. Jim swore by a daily regimen of vitamin pills and herbal supplements. He spent his final weeks in the home of “Little Jim” and Christine and passed away peacefully on Sunday, November 4th, at the age of 95. A service was held at the Rabenhorst Funeral Home in downtown Baton Rouge on Saturday, December 15th.
The James W. Robinson Graduate Student Scholarship in Analytical Chemistry was the last in a series of philanthropic initiatives of Professor Emeritus Jim Robinson. His goal was to ensure continuing excellence in the LSU Department of Chemistry by establishing endowments to support graduate students in analytical chemistry. The new scholarship was designed to help attract new students into our PhD program. The first recipient of the scholarship is Ms Elizabeth Thomas. Elizabeth obtained her BS degree at Western Carolina University in December 2017. Following an outstanding academic first semester at LSU, she recently joined Professor Robert Cook’s research group in analytical and environmental chemistry. The current earnings from the endowment provide an enrichment for one student for one year. Fittingly, following his passing, Professor Robinson’s family requested donations be made to the scholarship’s endowment in lieu of flowers. We encourage those who knew Jim, and would like to honor him and simultaneously help recruit strong graduate students in analytical chemistry, to make a donation via the LSU Foundation.

In June 2016, Attres assumed the role of Assistant to the Chair, a title that belies the depth and breadth of duties overseeing all things financial, research proposal preparation and grant management, plus coordination of the office and assorted services to faculty and students. In the past two and a half years, she has taken a fresh look at many procedures, with the goal of improving functionality and efficiency. There has been a move toward less paper in the office, with documents being shared electronically.

With the introduction of the Workday system on July 1st 2016, there were cries of despair across campus about getting research grant accounting information. Attres was able to extract this information, providing accurate balances to our faculty and peace of mind that our grants are being managed properly. Workday changed the way we do many things and provided the opportunity to review staff job descriptions. Recognizing the importance of helping faculty with grant preparation and accounting, we converted a former Accounting Supervisor position into a Grants Coordinator.

Attres is the goddess of the spreadsheet. With a few mouse clicks, everyone in the office can access account balances — everything from a faculty member's research grant to a Foundation account for a scholarship. This has been achieved by a sophisticated Excel workbook. Everyone in the office has the same information in real time for assorted purposes. With the implementation of these changes, our Department takes a more proactive approach to pre- and post-award management, which has been recognized by both the Office of Sponsored Programs and Sponsored Program Accounting.

Attres leads her staff by example, with her work ethic and can-do attitude. She is an ex officio member of the Department's Executive Committee and works closely with the Chair to ensure the smooth running of the Department.
Rendy Kartika Earns 5-Years of NIH Support

Associate Professor Rendy Kartika’s research interests lie in the field of synthetic organic chemistry, focusing on the development of new methods to effect challenging transformations. He began his independent career at LSU in the summer of 2011 and moved his lab to the Chemistry and Materials Building when it opened in Summer 2012. In 2015, his project “Global Chlorination: a General Synthetic Strategy Toward Chlorosulfolipid Natural Products,” received funding from NSF. In this area, he rapidly developed stereoselective methods, based on triphosgene/base as the chlorine source, to generate primary and secondary alkyl chlorides, 1,2-dichlorides, 1,3-dichlorides and vinyl chlorides. The Kartika Group has published five papers in this area so far.

Dr Kartika received a number of awards in 2017, in recognition of his early research accomplishments, including the LSU Rainmaker Emerging Scholar in STEM, Phi Kappa Phi’s Non-Tenured Faculty Award in Natural and Physical Sciences and an LSU Alumni Association Rising Faculty Award. To-date he has graduated three PhDs from his group, with seven current graduate students (see photo) and a steady stream of undergraduates. He was promoted to associate professor with tenure effective August 2017.

The next phase of Dr Kartika’s career is off to a strong start with the recent news of an R01 award for his project titled, “New Synthetic Chemistries Enabled by Oxyallyl and 2-Aminoallyl Cations.” The Report Project Grant (R01) is the original funding mechanism of the NIH, designed to support a discrete, specified, circumscribed project in health-related research. Kartika’s proposed research is based on the generation and regioselective trapping of unsymmetrical allylic cations, stabilized by resonance with a heteroatom, to produce an array of functionality, including 1,4-dicarbonyl compounds, 3-substituted indoles and carbazoles (see Scheme).

Some of these motifs are valuable intermediates in further synthesis and others are of biological or pharmaceutical interest. Kartika says, “The long-term goal of our research program is to investigate the synthetic applicability of unsymmetrical oxyallyl and 2-aminoallyl cation technology in generating a library of novel small molecules in the chemical space that are suitable for high throughput screening in drug discovery.”

In 2017, Kartika worked with LSU’s Office of Research and Economic Development (ORED) and Office of Innovation & Technology Commercialization (OITC) to set up membership for LSU in the Open Innovation Drug Discovery Program (OIDDP) with Eli Lilly. Already, several compounds from the project have been found to inhibit interleukin-17A and PCSK9 proteins; inhibitors of these proteins are used to treat psoriasis and to lower cholesterol respectively.

SPRING 2019 SABBATICAL LEAVE

In Spring 2019, Professor Donghui Zhang and Associate Professor Justin Ragains are on sabbatical in the Netherlands. Zhang will collaborate with Professor E. W. Meijer of the Institute for Complex Molecular Systems at the Eindhoven University of Technology. Ragains will be hosted by Professor Geert-Jan Boons of the Departments of Pharmaceutical Sciences and Chemistry at Utrecht University.
Rachel D'Arensbourg has served the Department of Chemistry as the Coordinator of the Undergraduate Office since late November 2015. In 2018, she was the recipient of the Department's Outstanding Staff Award. Her formal job description includes such tasks as copying exams, helping with student records, and running documents to and from the Office of Disabilities Services and Testing Evaluation Services. Her exceptional contributions to facilitate the undergraduate program in Chemistry were recognized by independent nominations from three faculty members, one of whom summarized that he was “very impressed with her productivity, her friendliness, and her professionalism.” Further, Rachel “gets the job done correctly AND on time.”

Prior to joining LSU, Rachel worked at an elementary school for more than 10 years, with a focus on teaching computer skills, mathematics, literacy and helping children with special needs.

Rachel is described as an “oasis of calm” in times of crisis. Her naturally caring nature and strong interpersonal skills, have made her a key player in managing and resolving some unfortunate situations, including medical emergencies.

In 2017, she started helping the Chemistry Majors Taskforce, a group of faculty charged with the recruitment and retention of chemistry majors. Rachel prepared and distributed flyers, ordered food, reserved rooms and generally helped with the organization of events. In 2018, she was appointed an ex officio member of the Taskforce.

Dr Linda Allen, Director of Undergraduate Laboratories, and Rachel’s immediate supervisor calls Rachel our “Little Miss Sunshine.” Recognizing her devotion to all things Disney and the fact that Rachel is “practically perfect in every way” the inscription on her award plaque calls her, “Our adorable Mary Poppins.” Rachel keeps candy handy for visitors, knowing well that “a spoonful of sugar makes the medicine for down.”

### 2019 HOMECOMING COLLOQUIA

This year we will feature two accomplished graduates of our Department, now formally retired from tremendously successful careers in industry. Colloquia are held in the Life Sciences Annex Auditorium (101A) at 3:30 pm on Fridays.

**MIKE GRIFFITH**  
(PhD ’68)  
MARCH 8th

**PAUL BURAS**  
(MS ’79)  
OCTOBER 11th

### NEW RESEARCH FUNDING

**Professor Donghui Zhang** has received funding from the NSF's Engineering Division for her project titled, “The Use of Amphiphilic Polypeptoids to Connect Nanoparticle Containing Lipid Rafts onto Liposomes and Erythrosomes Through Self-Assembly.” This is a collaborative project, with Zhang sharing the role of PI with Professor Vijay John of Tulane University.

**Professor Graça Vicente** and **Associate Professor Petia Bobadova-Parvanova** (Rockhurst University, Kansas City, LSU postdoc 2002-03, Hall Group) have received funding from the NSF’s Chemistry Division for their project titled, “Synthesis, Properties and Dynamics of BODIPY-based Fluorophores.”

**Professor George Stanley** has received funding from the ExxonMobil Chemical Company for his project titled, “High Activity Cationic Cobalt Hydroformylation Catalysts.”

- **Professor John Pojman** is the recipient of a LIFT2 grant titled, “Bipolymers for Marine Application Derived from Sugarcane Byproducts,” from the LSU Board of Supervisors.
Two Generations of LSU Chemistry PhDs

In the Spring 2018 issue we noted, with sadness, the passing of Joe Dean Sauer, a 1976 PhD graduate of our Department. Joe received his undergraduate degree from the Southwestern Oklahoma State University where he met Carolyn Haggard; the two married in 1969 and moved to Baton Rouge in 1971. Carolyn registered for an MA in Education and Joe entered the LSU Chemistry PhD program. He joined the embryonic research group of Professor George Newkome in Coates Hall. Of his former student, Newkome says, “he was part of so many things ... he contributed or helped write 12 published manuscripts as well as 11 abstracts at national ACS meetings while in my lab.” Sauer was involved in the first report of a 2,6-pyridinophane, a co-author on a substantial review on macrocycles possessing subheterocyclic rings (Chem. Rev. 1977, 77, 513-597), and contributed to the definitive structure of isosucrose (Carbohydr. Res. 1976, 48, 1-11). His dissertation was titled, “The Synthesis of Heteromacrocycles Containing the 2,6-Pyridine Moiety.”

Following graduation from LSU, Dr Joe Sauer joined Ethyl Corporation, the company that ultimately morphed into Albemarle. He became a recognized expert in using bromine chemistry to create new products with diverse applications, including fire retardants, biocides, surfactants and catalysts. Several biocides were patented and ranged from quaternary ammonium compounds to hydantoin derivatives. With everyday applications, including the control of Salmonella contamination of eggs, he contributed to products familiar to the layperson.

Over the years, Joe retained strong ties with LSU. In the early 1980s, he was an enthusiastic lecturer in Chem4160 (Industrial Organic Chemistry). He introduced the class to practical applications of industrial research. According to Alumni Professor Emeritus Bill Daly, “he stressed both the opportunities and the challenges of a career in industry and the importance of continuing to learn. His efforts were greatly appreciated by the students in the class.”

On the homefront, Joe and Carolyn had two children. Danny still lives in Baton Rouge and is a computer project manager. Anne Marie Sauer followed more closely in her father’s footsteps, but with some notable differences. She received a BS in Chemistry, with a minor in Psychology, from LSU in 2000. She entered the PhD program in Fall 2000 and ultimately completed a dissertation titled, “Enantioselective Syntheses and Chemical Investigations of Plant-Derived Bioactive Volatile Compounds.” Her graduate research involved the synthesis of nootkatone and derivatives, sesquiterpenes with repellent properties toward termites. Her primary advisor was Associate Professor Bill Crowe, but through the interdisciplinary nature of her project, she also collaborated with Professors Roger Laine (Biochemistry) and Gregg Henderson (Entomology). Following graduation in 2005, Anne joined “the Albemarle family” as a PhD Research Chemist. She simultaneously enrolled in LSU’s Flores’ Professional MBA program, receiving her degree in 2009. In 2016, she moved to Charlotte, NC, to become Global Director for R&D and Business Development for Lithium with Albemarle.

Through his years at Albemarle, Joe Sauer rose through the ranks to become R&D Advisor in the Research Funding Group. According to Anne, “Dad was an influencer, always sharing and teaching what he learned ... he overflowed with positive energy.” George Newkome notes that “his work ethic has been seeded in many LSU BS and PhD students.” For Joe, the “how” and the “why” were as important as the “what;” for him, any project was about the journey. Obviously Anne learned a lot of him. As a parent, Joe was protective and concerned that Anne’s step onto the business side would be a difficult transition. Despite the inherent challenges, Anne was able to stay true to her roots, proving that she could master environment with strength and grace. Her combination of R&D expertise, her training in psychology and her business acumen have already enabled her to champion business cases for emerging technology and lead teams through functional transformation and integration processes to launch products across diverse markets. She has recently joined Sealed Air’s Food Care Team as their Global Sector Lead of Adjacent Markets in Charlotte, North Carolina. Joe was incredibly proud of Anne and her accomplishments and “how” she approached life. Indeed, Joe’s legacy lives on through Anne.
Neutron scattering techniques are becoming increasingly powerful, broadening their application in many areas of science. The Louisiana Consortium for Neutron Scattering (LaCNS) is led by Professor John Ditusa (Department of Physics and Astronomy) who secured funding from the Department of Energy in 2014 and successfully renewed the grant in 2017. The LaCNS is a groundbreaking, innovative partnership centered at Louisiana State University, geared to investigate the properties of advanced materials through highly collaborative synthetic, experimental, computational, and theoretical research. The team makes use of the modern neutron scattering techniques available at Oak Ridge National Laboratory (ORNL) to explore the structural, magnetic, and dynamic properties of hard and soft materials systems. Faculty members in the Department of Chemistry lead the soft matter program, including Professor Donghui Zhang, Associate Professor Gerald Schneider, and Assistant Professor Revati Kumar. Professors Evgueni Nesterov and Jayne Garno were involved in the first phase of the program. Assistant Professor Weiwei Xie received seed funding for the study of hard materials last year. There are currently 11 graduate students in the Department that are associated with LaCNS. Dr Zhang’s Group focuses on the design, synthesis and characterization of biomimetic, bioinspired and bio-related functional polymers (b3p), in particular, peptidomimetic polymers. Dr Schneider joined the LSU faculty in 2015 (see Fall 2018 newsletter). His group utilizes small-angle neutron scattering, neutron spin echo spectroscopy, and quasielastic neutron scattering to unravel the fascinating morphology and dynamics of polymer melts and polymers in solution and in composites. In 2018, graduate student Garrett Sternhagen (Zhang Group) and postdoctoral associate Sudipta Gupta (Schneider Group), along with collaborators, published an article describing “Solution Self-Assemblies of the Sequence-Defined Ionic Peptoid Block Copolymers” (J. Am. Chem. Soc. 2018, 140, 1400-1409, see Figure). Dr Revati Kumar employs molecular dynamics simulations, in conjunction with neutron scattering data from her experimental collaborators, to study soft matter, including the synthetic process, stability, and dynamics.

To enhance the capabilities of the LSU-based expertise that has been fostered by the LaCNS, the Department of Chemistry currently has a faculty search underway for a scientist with experience and expertise in the biological applications of neutron scattering. Schneider is chairing the search committee; we look forward to introducing a new faculty member soon. For more information about the LaCNS, visit their website (https://www.lsu.edu/physics/lacns/).

### NEWS IN BRIEF

- **Dr Rolanda Wilkerson** (LSU PhD ’04) has been named one of the 2019 TEDxLSU speakers. The event is scheduled for Saturday, March 23rd.

- **Autumn Webb** (Graduate Student, Elgrishi Group) has been selected as an ACS Science Coach, partnering with Elizabeth Kimball (LSU Chemistry MS ’17) at Plaquemine High School.

- **Associate Professor Rendy Kartika** has received further funding from the LSU Student Technology Fee to complete the modernization of equipment in the Organic Teaching Laboratory.

- **Associate Professor Joseph “Kip” Rugutt** (Missouri State University – West Plains, LSU Chemistry postdoc, Warner Group) recently received grants from the Carnegie African Diaspora Fellowship (CADF) program to develop collaborative drug discovery research projects with colleges and universities in Kenya.
A significant measure of a great university is the support it receives from its alumni. Join us as we work on the leading edge of discovery and innovation to educate the next generation of scientists. If you would like to support LSU Chemistry, regardless of the amount, we would be most appreciative. All donations are tax deductible and qualify for Tiger Athletic Foundation (TAF) points.

To make your gift online, go to www.lsufoundation.org/givetoscience. Click ‘Designations’ and choose ‘Chemistry Development Fund’. To send your gift by mail, make your check payable to “LSU Foundation,” note “Chemistry Development Fund” on the memo line and mail your check to: LSU Foundation, 3796 Nicholson Drive, Baton Rouge, LA 70802

Super Science Saturday was held at the LSU Pete Maravich Assembly Center on October 27th, 2018.

Photo credits: Alumni Professor George Stanley (Event Organizer)

Friends and members of NOBCChE, Milcah Jackson, Christina Baptiste, Shaniqua Hayes and Julia Nauman produce “Instant Worms,” using calcium chloride and sodium alginate, with a young scientist and his mother.

An eager young scientist wears an important message - “stay curious!”

Graduate students Amanda Owen, Callie Stern, Anthony Mai, Peter Piers and Alex Cleveland demonstrate the wonders of liquid nitrogen to a crowd on the PMAC concourse.