



LSU

Department of  
Chemistry

Spring 2018

# NEWSLETTER

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## Searching for the Next Patrick F. Taylor Chair

### ENVIRONMENTAL IMPACT OF HAZARDOUS WASTE - POSITION #18430



Patrick F. Taylor



H. Barry Dellinger

The faculty search is underway to appoint a distinguished scientist to the Patrick F. Taylor Chair for the Environmental Impact of Hazardous Waste. The Chair was endowed by a generous gift from the late Patrick F. Taylor and matching funds from the State of Louisiana. Patrick Taylor was born in Beaumont, TX. In 1955 he came to LSU on a scholarship and graduated with a degree in petroleum engineering in the late 1950s. According to the Patrick F. Taylor Foundation website, he also had “an eye for oil, and a desire to ensure all young people have an opportunity for a college education.” He went onto a career in the oil industry, founding the Taylor Energy Company that he served as Chairman, CEO and President until his untimely death in 2004.

From 1998 to 2015, the Patrick F. Taylor Chair was held by Professor Barry Dellinger whose research focused on thermal degradation kinetics and degradation profiles of organic compounds with a special focus on hazardous organic pollutants. In 2008, Barry received the Astellas USA Foundation Award for having significantly contributed to scientific research that improved public health and he was the 2014 recipient of the ACS Award for Creative Advances in Environmental Science and Technology. Professor Dellinger retired in 2015 and passed away early in 2016. Professor Dellinger represents the caliber of person we seek to fill the Taylor Chair.

These are big shoes to fill, with the job advertisement calling for “an innovative research program in the development of technologies to monitor, treat, and reduce or eliminate hazardous environmental contamination, with the goal of sustainable chemistry and a scientific basis for alleviating state, national and international environmental contaminant problems.” If you know of anyone who might measure up and be interested, direct them to our homepage or contact Les Butler (Chair, Search Committee, [lbutler@lsu.edu](mailto:lbutler@lsu.edu)) or Carol Taylor (Department Chair, [cmtaylor@lsu.edu](mailto:cmtaylor@lsu.edu)).

# Southern Sisters



Jasmine Drake  
Assistant Professor,  
Texas Southern University, TX



Kandace Hurst  
Instructor of Chemistry  
LSU

Drs Jasmine Drake and Kandace Hurst both have BS degrees from Southern University and PhD degrees in Chemistry from LSU. “Kandace thinks I’m so corny when I say we’re the Venus and Serena of Chemistry,” says Jasmine. However, like the superstars of the tennis world, these sisters have excelled, embracing their degrees in chemistry to become faculty members and sharing their passion with the next generation. Kandace says, “I get a little dopamine release when students have a ‘lightbulb’ moment.”

The sisters grew up in Baton Rouge, where they lived in a household of avid readers and were encouraged to participate in STEM activities. Their mother, Shermaine Thomas, has over 30 years of experience working in the Department of Children, Youth, and Family Services (DCYFS) in the State of Louisiana. Their father, Kemp Thomas, III, has over 25 years of industry experience

and is a military veteran who was awarded with a Purple Heart. They have a younger sister, Angela Thomas, who is a LSU graduate with a BS degree in Sociology, and has followed in her mother’s footsteps, currently working with Social Services for the State of Louisiana. Mrs Thomas taught her daughters many things, including organizational skills, multi-tasking and to go after what they believe in.

Jasmine and Kandace attended Scotlandville Magnet High School where they say several LSU Chemistry graduates got turned onto science. At Southern University, as undergraduate students, they cite several mentors and key educational influences. Jasmine recalls Southern’s Chair of Chemistry, the late Dr Ella Kelley “always had the right amount of understanding and tough love to challenge me to stretch myself academically.”

Jasmine, the eldest of the three girls, was the first to join LSU Chemistry as a graduate student in 2002. She was a member of the research group of Professor Julia Chan and worked on the synthesis and characterization of lanthanide intermetallic materials using single crystal X-ray diffraction, powder X-ray diffraction and scanning electron microscopy. In 2002, Kandace was still an undergraduate across town at Southern University. She had a number of research experiences as an undergraduate, including a summer at Iowa State University and two summers at Albemarle R&D. Graduate school was the obvious next step and she didn’t have to think too hard about where to go. Ultimately, she followed in the footsteps of her big sister, joining the Chan Group. Jasmine graduated in 2007 and Kandace in 2010. Conceding that siblings in the same research group are probably not so common, Jasmine says, “We’re already sisters, so being double-related in our chemistry family didn’t bother us.” Kandace appreciated having someone close who had already successfully navigated the milestones of the program, saying, “I have always valued her advice and opinions, which were always sound.”

Following graduation, Jasmine was awarded a National Research Council Postdoctoral Fellowship at NIST. She later accepted a position at the Drug Enforcement Administration (DEA) in Dallas. Her role involved talking to those in the field, analyzing evidence and seeing things play out in the courtroom. During her time with the DEA, Jasmine also began to teach crime scene investigation classes to middle and high school students. She traces her early interest in forensic science back to the fiction of Patricia Cornwell and James Patterson. While most kids were playing video games, she was rounding up her sisters and “playing school.” She ultimately left the DEA to pursue teaching chemistry and forensic science full time at Nimitz High School and Cedar Valley Community College. For 3.5 years, she was a faculty member at Sam Houston State University in Huntsville, TX. Today she is an Assistant Professor in the Barbara Jordan – Mickey Leland School of Public Affairs at Texas Southern University in Houston. She serves as the Laboratory Coordinator of their state-of-the-art Forensic Science Learning Laboratory. Combining her passions for chemistry and government, she teaches courses in forensic science and the administration of justice. Dr Jasmine Drake was recently appointed by the Governor as a Member of the Texas Forensic Science Commission.

Inspired by her experience as a teaching assistant, the ChemDemo outreach program and the GK-12 program (geared toward implementing new scientific subject areas in local middle schools), Kandace went on to earn Secondary Teacher Certification through the Louisiana Department of Education. She taught at East Ascension High School in Gonzales for a couple of years. In Fall 2014, she returned to LSU as a full time instructor where she teaches both lecture and laboratory classes for General Chemistry. In the words of her big sister, “Kandace is way smarter than me!! ... You can explain a complex scientific theory to her, and she can process it, understand the applications, and then teach it someone else.” Her students feel the same way, with a Spring 2017 Chem1212 student stating, “Professor Hurst is an outstanding teacher and explains everything well. She has taught me how to have a

# Southern Sisters (continued)

better work ethic and how to work smart.” Kandace is responsible for teaching the students in the Science Residential College and in Spring 2017, she received a University College Tiger Athletic Foundation Teaching Award. She enjoys the classroom but sees that she can contribute more broadly to the areas of curriculum development and assessment. She currently serves on an *ad hoc* College of Science committee geared toward retention of science majors and, in 2018, is becoming involved in a bridge program to better prepare incoming science majors for their university experience.

Of their time at LSU, both Jasmine and Kandace are grateful for a supportive environment and the opportunities to get engaged in seminars, conferences, events and organizations. Despite their different paths, they are both ambitious and dedicated to their faculty positions and their families. When asked if they share trials and tribulations of the profession with each other, Kandace responded, “Always! It is such a privilege to be able to regularly share stories with someone close to me that ‘gets it.’ I often call Jasmine on my way home.”



Kandace, the late Dr Ella Kelley and Jasmine

## Deck the Halls

On Thursday, December 14th, the Department hosted its annual holiday party on the unfinished fifth floor of the Chemistry and Materials Building.



Chemistry Graduate Student Council sponsored commemorative t-shirts: Huy Nguyen, Chris Sumner, Peter Piers, MP Hayes, Ryan “RJ” Johnson and Nichole Kaufman



Professor Emerita Sandra McGuire and Associate Professor Doug Gilman join in the festive game of bingo.



Kelly Pitre (former Assistant to the Chair) and Vickie Tate Thornton (Operations Manager)



Professors Emeriti Gresdna Doty (Theater) and Jim Traynham (Chemistry)

# Emory Chan Delivers 2017 Benjamin P. Boussett Lecture



Drs Emory and Hai-Lim Chan in the Benjamin P. Boussett Conference Room

On Friday, October 6th, Dr Emory Chan delivered an elegant lecture titled, "High-Throughput Design of Doped Colloidal Nanocrystals." He explained the energy transfer pathways of lanthanide-doped upconverting nanoparticles and we learned about the combinatorial synthesis of these carefully designed nanoparticles, using robots called WANDA and HERMAN. We observed "the pork chop experiment," *i.e.*, you don't want to cook the tissue that you are imaging. In more sophisticated experiments, an undergraduate researcher used nanoparticles to image cross-sections of rat brains. The nanoparticles were optimized for excitation at wavelengths ideally suited to the task. A serendipitous finding in the student's work has enabled the fabrication of microscale, upconverted lasers for biological sensing and simulation.

Dr Chan received his BS with Honors and Distinction from Stanford University and his PhD from the University of California at Berkeley with Professors Paul Alivisatos and Richard Matthes. Over the past decade, he has served in various capacities at The Molecular Foundry, at the Lawrence Berkeley National Laboratory, where he is now a Staff

Scientist in Inorganic Nanostructures. Dr Chan grew up in Baton Rouge and is no stranger to LSU, with both his parents being faculty members. Professor Emeritus Hai-Lim Chan (Physics) was in attendance at his son's homecoming lecture.

The annual lecture is named for the late Benjamin P. Boussett, an LSU University Medalist who became a graduate student in the Alivisatos Group at the University of California at Berkeley. He was tragically killed in a car accident a few months before defending his dissertation. In introductory remarks, Professor Robin L. McCarley and Dr CJ Dubois (Dupont) remembered Ben and his days as an undergraduate at LSU. In early slides, Emory Chan shared his reminiscences of his "glovebox mate" and showed a photo of their "gear." Ben's box was labeled the "Lair of Boussett." Boussett family members in attendance were Anne and Christian, Joel, Kelly and Margot. In addition to Emory, other friends of Benjamin Boussett able to attend the lecture this year were CJ Dubois (and his son Benjamin) and Steve Damo and Christine Micheel (and their son Benjamin).



Anne Power - Best Costume

## Haunted Halls

Our students got into the spirit of Halloween. Student Affiliates of the American Chemical Society (SAACS) iced and gave away cupcakes in the Choppin Lobby on October 26th. There was a cupcake for each element of the periodic table.

The Chemistry Graduate Student Council (CGSC) organized a halloween party on the fifth floor of the Chemistry & Materials building, including an EHS-approved haunted house.



Autumn Webb and Lea Gustin - Pumpkin Carving Contest winners



Heidi Nowakowski and Nghi Tran with their sweet treats

# McCarley Research Group Looking at Cancer Cells in New Ways

Professor Robin L. McCarley joined the faculty at LSU in 1992 as an assistant professor. Since 2007, he has been the Barbara Womack LSU Alumni Association Endowed Professor. A former LSU Distinguished Research Master in STEM (2011), he broadly describes his research as the “development of new materials for measurement science applications and the methodologies needed to evaluate such materials.”

A current major project, titled “Enzyme Activatable Substrate Probes for Fluorescence Imaging and Quantification in Cells” was funded by the Chemical Measurement and Imaging Program of the Chemistry Division of NSF in 2015. The program involves the design and synthesis of smart dye molecules that are “turned on” in the presence of enzymes that are expressed at higher levels in cancer cells relative to healthy cells. High sensitivity and reliability of the real-time assays are being tested by microscopy and cell-counting methods.



Robin McCarley

In Fall 2016, Professor McCarley spent a sabbatical at the National Cancer Institute in Bethesda, MD, forging a collaboration with Dr Hisataka Kobayashi, an MD/PhD surgeon working at the forefront of ovarian cancer imaging. Using mouse xenograph models for ovarian cancer, they were able to obtain quantitative measures of target-to-background imaging for tissues that overexpress NQO1 [NAD(P)H quinone dehydrogenase 1]. The ratios were better than anything seen before, and they were able to detect tumors as small as 1 mm. Downstream, surgery using these imaging techniques will be able to remove tumors with clear margins more effectively, decreasing the likelihood of recurrence.

In September 2017, NSF awarded McCarley a “special creativity extension” in the form of two additional years of funding for related research. Such creativity extension awards are rare, with roughly 30 faculty in the US receiving them each year out of a total 43,000 active NSF grants. According to the NSF Grant Proposal Guide, “The objective of such extensions is to offer the most creative investigators an extended opportunity to attack adventurous, ‘high-risk’ opportunities in the same general research area, but not necessarily covered by the original/current proposal.” Indeed, during the first two years of the project, upon which these prestigious awards are based, the McCarley Group published 10 papers, some in high impact chemistry journals like *Chemical Communications* and *Analytical Chemistry*. According to McCarley, one of the greatest challenges is writing to new audiences, with papers being published in *Cancer Research* and *ACS Chemical Biology*.

Further recognition of the merit of research in the McCarley Group is the award of three NSF Graduate Fellowships to current members: Ansonia Badgett (2015), Milcah Jackson (2016), and Chris Sumner (2017). Professor McCarley works closely with his talented students to provide them with training in interdisciplinary science, preparing them in a more general sense, to solve complex scientific problems.

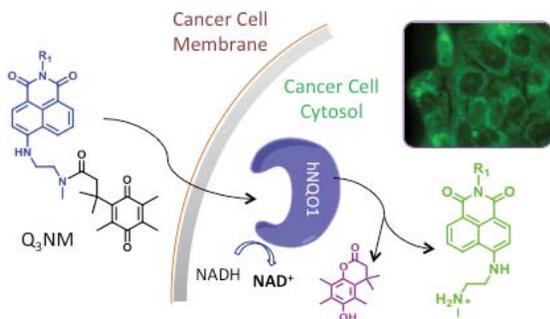


Figure. As disclosed by Prasai, Silvers and McCarley (*Anal. Chem.* **2015**, *87*, 6411-6418), a naphthalimide probe (Q3NM) enters a cancer cell. In the presence of elevated levels of the redox-reactive hNQO1 enzyme, the probe is cleaved to release a highly fluorescent green-energy-range reporter. Thus, the cancer cells appear green.

## SPRING ACS MEETING

New Orleans, LA

LSU Chemistry Reception

Tuesday, March 20th, 5:00-7:00 pm

Hampton Inn, Convention Center

Stop by to meet current faculty and peruse research posters.

# Alumni Return to Share Experiences with Current Students



Rolanda Wilkerson

Over the past few years, we have been gathering profiles of alumni on our website. We showcase one or two of these in each issue of the newsletter. In the next phase of putting current and former students in touch, alumni are visiting LSU to give a seminar about their science, professional experiences and share words of wisdom with current students. The first of these took place on November 17th, 2017. Dr Rolanda Johnson Wilkerson received her BS from Southern University in 1999 and her PhD from LSU in 2003, conducting her research with Rob Strongin. She is currently a Principal Scientist and Senior Manager of Scientific Communications in Beauty Care at Procter & Gamble in Cincinnati, OH. In her talk, titled *From the Chemistry Lab to Developing Consumer Products: The Journey of a PhD Chemist*, Rolanda described how one experience builds on another. She explained how chemistry is vital to the design of haircare (and other) products and that her willingness to take chances, her scientific expertise and her communication skills are what has brought her to her current position. We welcomed Drs Ed Doomes (LSU PhD '02, Poliakoff), his colleagues Kinesha Harris and Conrad Jones and several of their students from Southern University to the event. We all look forward to hearing about Rolanda's endeavors into the future.

## UPCOMING ALUMNI SEMINARS:

These talks are held in the Life Sciences Annex Auditorium, A-101, at 3:30 pm on Fridays, followed by a reception in the Choppin Lobby. Consider yourself invited!

January 19th, 2018: Ms Sharon Vercellotti (BS '63, undergraduate research with Jim Traynham), President, V-LABS, and her husband and partner Dr John R. Vercellotti.

*From LSU Chemistry in 1963 Through Forty Years as an Entrepreneur at V-LABS in Covington, LA, Serving the Glycosciences*

February 9th: Dr Emmanuel Waddell (PhD '00, Soper), Associate Dean, University of Alabama at Huntsville, 2017-19 National President of NOBCChE  
*Kinetically Speaking: Move at Your Rate*

April 6th, 2018: Dr Pernendu (Sandy) Dasgupta (PhD '77, West), Hamish Small Chair in Ion Analysis and Jenkins Garrett Professor of Chemistry and Biochemistry, University of Texas at Arlington

*An Ion Chromatograph for Extraterrestrial Explorations. A Mission to Mars?*

April 20th, 2018: Dr Curt Holmes (BS '65), Greatbatch, Inc.

*Lithium Batteries for Implantable Biomedical Devices – Chemistry and Applications*

## News in Brief

Daniel Kuroda (Assistant Professor) and Fedra Leonik (Instructor) welcomed a little brother for Dylan. Rory Kuroda was born on October 2nd, 2017.

Treva Brown (BS '11) successfully defended her PhD dissertation in inorganic materials chemistry at the University of New Orleans on November 13th, 2017. She has accepted a position as a Physical Scientist at NASA in Stennis, MS.

Dewey Carpenter (Emeritus Professor) passed away on October 9th, 2017.

Joe Sauer (PhD '76) passed away on October 1st, 2017. Joe was a senior R&D Advisor in the Research Funding Group at Albemarle. He was affiliated with both Chemistry and Chemical Engineering at LSU and contributed to teaching industrial organic chemistry.

Tyrslai Williams (PhD '17) served the Department as a temporary instructor in the Organic Teaching Laboratory in Fall 2017. In the new year she will commence as the Assistant Director of Programs in the LSU Office for Strategic Initiatives.

Lavrent Khachatryan, Research Assistant Professor, was part of the Lignin "Beads" Team that won the AgCenter / College of Agriculture's 2017 Tipton Team Research Award. Other team members were Dorin Boldor, Carlos Astete, Pranjali Muley, Christina Sabliov, Dorel Moldovan, Elizabeth Martin, Phillip Jung, Joey Blackburn and Yongchan Kwon.

Megan Macnaughtan (Associate Professor), and her husband, Associate Professor Aaron Smith (Biological Sciences) are on sabbatical at the University of Western Australia in Spring 2018.

John Pojman (Professor) is temporarily resuming his role as Director of Graduate Studies in Spring 2018.

# 20th Anniversary of ChemDemo

In the Fall of 1997, Professors George Stanley and Pat Limbach began sending LSU students out into the community to teach lessons that featured exciting, hands-on demonstrations ... and so was born ChemDemo. Limbach, now VP for Research at the University of Cincinnati, said, "Honestly, this program was really George's baby. I just served as a young assistant professor guinea pig to help him make his dream a reality."

At noon on Saturday, September 16th, the Baton Rouge Local Section of the ACS hosted a jambalaya lunch on the Choppin/Williams concourse. At 1 pm in the Williams 103 auditorium, Department Chair, Carol Taylor, gave a welcome and background on the ChemDemo Program. Eight demonstrations ensued by assorted student groups and faculty:

Silly Putty (RJ Johnson, NOBCCHE)

Liquid Nitrogen (Carson Szot, James Morvant and Patrick Dicken, SAACS)

Acids & Bases (Chris Sumner, Nichole Kaufman and Peter Piers, CGSC)

Styrofoam & Starch (Assistant Professor Daniel Kuroda)

Quantum Fireballs (Assistant Professors Noémie Elgrishi and Matt Chambers)

LSU Clock Reaction (Assistant Professor Semin Lee)

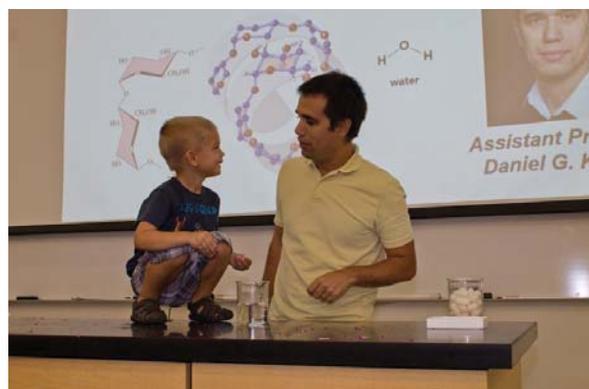
Energy – When 50,000 Volts Won't Kill You (Associate Dean Andy Maverick)

Stoichiometry - aka Exploding Balloons - (Cyril & Tuttle Vetter Alumni Professor George Stanley)

The event concluded with the synthesis of liquid nitrogen icecream by Heidi Nowakowski and her SAACS team in the Choppin Lobby. The event was sponsored by the ACS Baton Rouge Local Section and the LSU Department of Chemistry. Ongoing contributions to the ChemDemo program are gratefully acknowledged from Albemarle, Dow Chemical Company, the ExxonMobil Foundation and Mrs Margaret Vail Roussel.



Professor George Stanley demonstrated stoichiometry by exploding balloons



Assistant Professor Daniel Kuroda and his assistant, Dylan Kuroda, explain the different properties of Styrofoam and starch packing materials (you can only eat one)

Photo credits: Vickie Tate Thornton

## ChemDemo for All Ages

On Tuesday, November 7th, four members of the Student Affiliates of the American Chemical Society (SAACS) visited St James Place. The event was coordinated by Ms Margaret Vail Roussel (resident and friend of LSU Chemistry), Ms Tarilyn McBride (St James' Life Enrichment Manager) and Carol Taylor (LSU Chemistry Chair). The LSU undergraduate students performed demonstrations that featured liquid nitrogen. They described the physical principles involved as balloons filled with gas, shriveled on cooling and expanded again on warming to room temperature. Frozen flowers were passed around, giving folks the chance to see how brittle they become. Attendees included Neil and Arlene Kestner (also good friends of LSU Chemistry) who moved into a garden home at St James in late 2016. On the in between, the students fielded questions about what attracted them to Chemistry and the nature of their career aspirations.

Participating students were Heidi Nowakowski (Chemistry Senior), Hayden Tageant (Chemistry Sophomore), Kristin Sobie (Chemistry Sophomore) and Catalina Murillo (Chemical Engineering Senior).



Catalina Murillo and Kristin Sobie share frozen flowers with residents of St James Place

# Learning Labs: Who Kidnapped Mike the Tiger?



MSMSC students in the Choppin Learning Lab

*Mike the Tiger has been investigating a pollution scandal on campus. Someone has been dumping toxic waste into the LSU lakes, and Mike decided to try to find out who. He was getting close to the truth when, earlier today, someone broke into the lab and kidnapped Mike. Can you look at the clues and figure out who kidnapped Mike?*

In Spring 2017, two students, Hana Malkawi and Spencer Duet, both majoring in Chemistry with a concentration in Secondary Education, took on a unique research opportunity in CHEM 4005, under the tutelage of Dr Linda Allen, Director of Undergraduate Laboratories. Hana and Spencer developed experiments to use in the Learning Lab, a laboratory room set up for visiting middle school and high school students to come and do experiments at LSU. Their mandate was to find experiments that would appeal to students whilst simultaneously addressing various grade level expectations and learning targets that meet common core standards in science. They decided to

focus on environmental experiments with a tie into forensic science. The level of the experiments is customizable to the grade of the students. Hana and Spencer also created TA (teaching assistant) notes for other future leaders of the experiments.

The storyline, with Mike the Tiger investigating lake pollution, shows the application of chemistry to solve problems in the real world. Students perform a series of experiments to test the water and soil samples from the LSU lakes, to make a polymer “worm” and compare it to waste products found in the LSU lakes, and finally to develop a fingerprint left behind by the kidnappers. An additional experiment for high school students involves paper chromatography, enabling them to identify the ink used in the ransom note.

The first group of students to visit the lab were upcoming 8th graders who were attending the LSU Middle School Math & Science Circle (MSMSC) this past summer. Sam Bynum and Chase Chambers, graduate student TAs, guided the students’ activities. Their visit concluded with Dr Linda Allen demonstrating the synthesis of liquid nitrogen ice-cream. The students pronounced the Chemistry half-day as THE BEST DAY of the week! Geaux Chemistry!

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](http://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, 3838 West Lakeshore Drive, Baton Rouge, LA 70808