

A student in an orange shirt and safety glasses is working on a complex industrial machine in a laboratory setting. The machine is green and has various pipes, valves, and electrical components. A laptop and a monitor are on a table in the foreground, displaying data. The background shows a window and other laboratory equipment.

LSU

College of
Engineering

Cain Department of
Chemical Engineering

ALUMNI NEWSLETTER

VOLUME 30 · FALL 2015

A NOTE FROM THE CHAIR



John C. Flake
Jay Affolter Endowed Professor
Interim Department Chair

Dear Alumni and Friends:

Winston Churchill once said, "To improve is to change; to be perfect is to change often." As many of you know, the university has a special way of recognizing the talent in our department and college. In July of this year, Provost Stuart Bell accepted a new role as President of the University of Alabama. At the same time, Rick Koubek agreed to serve as Interim Provost and Judy Wornat agreed to serve as Interim Dean of the College of Engineering. In these changes, Dean Wornat asked me to serve our department as the interim chair. I was humbled by the opportunity and I am proud to represent such a strong department.

Our department has grown by a factor of 2.5 since I joined the faculty just 10 years ago. We currently have over 900 undergraduates in chemical engineering and our college is the 18th largest in the United States. Fortunately, construction of our new building is on schedule and we plan to start using some classrooms and labs as early as September 2016. Thanks again to everyone who had a hand in the new building. Also, we are fortunate to have hired three terrific new faculty members: Chris Arges, James Dorman, and Kevin McPeak. The new building and new faculty may change the face of our department, but the values and quality of our program will always be preserved.

Best Wishes,

BREAKING NEW GROUND



Construction continues on the new ChE building, as seen from Ceba Lane on November 11, 2015.

Work is moving full steam ahead on the new Chemical Engineering Building and the renovation of Patrick F. Taylor Hall. Interior demolition for Phase I is complete and the final beam of the ChE addition was put in place during the Topping Out Ceremony, held by the CoE on November 11, 2015.



Professors Valsaraj, Thompson, and Flake standing in the Cambre Atrium.

Scheduled for completion in fall 2017, the new and renovated engineering complex will include expanded, modern laboratory space for teaching and transitional research, a 250 seat auditorium, approximately 110,000 square feet of classrooms, a new student commons area, updated graduate student space, an academic support center, a dedicated capstone project space, and new labs, including an interactive "classlab" and sustainable living laboratory. The renovated facility will be connected to the chemical engineering addition by a continuous atrium, allowing students and visitors to observe teaching and research projects in action.

A WORD OF THANKS

We would like to thank the following individuals and corporations for their generous support of the Cain Department of Chemical Engineering over the last two years:

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On the Cover



LSU chemical engineering undergraduate students Samuel Eastman and Paul Arthur conduct experiments in CHE 3104 - Engineering Measurements Laboratory (Junior Lab/J-Lab, as it is affectionately called). This particular experiment studies the compression-refrigeration cycle (a practical study of the concepts of thermodynamics).

LSU

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Leading the Way

Dr. Mary Julia (Judy) Wornat began her tenure as Interim Dean of the College of Engineering in July 2015 after more than 20 years in academia and 13 years at LSU. She holds both the Robert Hughes Harvey Professorship and the William E. Reymond Professorship in Chemical Engineering.

Wornat has held various leadership roles since joining the college, first serving as the Director of Graduate Studies in the Cain Department of Chemical Engineering (2005-11), and most recently, as the Chair of the Cain Department of Chemical Engineering (2011-15).

Prior to coming to LSU, Wornat served on the faculty of Princeton University, in the Department of Mechanical and Aerospace Engineering. Prior to that, she worked as a research scientist for two years each at Sandia National Laboratories in Livermore, CA, and at the Commonwealth Scientific and Industrial Research Organization in Sydney, Australia.

Wornat received her BS in Chemical Engineering summa cum laude from Rensselaer Polytechnic Institute in Troy, NY, in 1981. She continued her studies at the Massachusetts Institute of Technology in Cambridge, MA, where she earned her SM in 1983 and her ScD in 1988, both in Chemical Engineering.

Wornat has received several teaching and research awards, including the National Science Foundation CAREER Award (1996); a Distinguished Paper Award from the Combustion Institute (2009); and LSU's Rainmaker Award, which honors the university's top 100 research and creative faculty (2009).

Wornat's research focuses on the pyrolysis and combustion of solid, liquid, and gaseous fuels—with particular emphasis on the chemical and physical mechanisms governing the formation of environmental pollutants, especially polycyclic aromatic hydrocarbons. Additional areas of interest are gas-phase and heterogeneous reactions; analytical techniques for

the compositional determination of complex organic mixtures; supercritical fuel reactions; and the health effects of combustion by-products. This research has led to the publication of more than 80 refereed journal articles.

Wornat is also very active in the chemical engineering field outside of her professional duties as interim dean of the college. She has served on multiple editorial boards including *Fuel* (1995-2010) and *Energy & Fuels* (2000-02). She currently serves on the editorial board of *Polycyclic Aromatic Compounds* (2004-present). She has also served as the President of the International Society for Polycyclic Aromatic Compounds (2005-07). Her memberships in professional societies include the American Chemical Society, the American Institute of Chemical Engineers, the Combustion Institute, and the International Society for Polycyclic Aromatic Compounds.

When asked what she would like students to know about her and her plans to lead the College of Engineering, Wornat replied:

“My advisor when I was in grad school used to say frequently, ‘I’m all the time learning from the students.’ And I have seen how true that statement is. I really love working with students. I love mentoring graduate students, undergraduate students. I love to see them learning and love to see them find opportunities because they’ve put in the work to earn that engineering degree.”

“There are so many things you have to do when you’re a professor or dean—meetings, decisions to make—but the whole reason we’re here is to educate students and prepare students for the world. The world has many problems to solve, and engineers are going to be the ones who solve them.”

“So, it’s important for me to stay focused on that mission. In the end, all of this is for the students.”

FACULTY AWARDS & NEWS

We are happy to introduce our three newest professors to the department, **Christopher Arges**, **James Dorman**, and **Kevin McPeak**.

Fall 2015



James Dorman comes to us from Germany, where he was an Alexander von Humboldt Fellow at the University of Konstanz. He received his PhD from the University of California, Los Angeles and his BS from the University of California, San Diego. When asked about his research interests, he said:

“Inorganic systems have largely been incorporated into our modern lives in the form of modern electronics.

As we continue to integrate these technologies into our daily lives, researchers must meet standards to increase the speed and power of these devices. This is exemplified in computer processors where the number of transistors within an integrated circuit must double every two years. Additionally, with increasing economic and environmental pressures, high cost, environmentally hazardous materials must be replaced with those that are readily available. One such direction is to use hybrid inorganic/organic systems to tune and amplify specific physical properties required in high efficiency devices. My lab focuses on understanding the role of each specific atom within the nanostructure to find suitable low cost replacements that are superior to those currently used. A specific example is in the investigation of luminescence in rare earth ions that are responsible for colors in displays and LEDs and replacing them with common transition metals. The luminescence of these transition metal elements is dependent on the crystal in which they are incorporated, e.g., Cr in both rubies and emeralds. The core areas of my research are divided into the following four sections: material synthesis, LEDs and lighting, energy generation, and energy storage.”



Kevin McPeak also comes to us from Europe, as he was a Group Leader at the Swiss Federal Institute of Technology. He received his PhD from Drexel University and his BS from Northwestern University. His research interests are focused on photocatalysis, plasmonic materials, and nanoscale chirality. When asked about his research, he stated:

“The McPeak Lab will utilize scalable nanomanufacturing techniques and high-quality metamaterials to solve critical problems in photocatalysis and environmental remediation. In situ characterization using synchrotron light sources and optofluidic microreactors will be used to study photochemical reactions. The fabrication and utilization of chiral (e.g., structures which are not superimposable on their

mirror image) metal nanostructures will be a specific focus of the McPeak Lab. Experiments and finite element simulations will work synergistically to enable a better understanding of metamaterials, fabricated from low-cost metals, and their ability to manipulate photochemical reactions.”

Spring 2016



Christopher Arges comes to us from Chicago, IL, where he was working as a postdoctoral scholar and research associate at the University of Chicago and the Argonne National Laboratory. He received his PhD from the Illinois Institute of Technology, his MS from North Carolina State University, and his BS from the University of Illinois.



Elizabeth Melvin has been at LSU for two years, serving as a part-time assistant professor. This fall, she accepted a new position in the department, a Professional-in-Residence, which is a full time post. Liz received her PhD and MS from North Carolina State University and her BS from The Ohio State University. She has worked numerous years in industry and academia and brings a wealth of knowledge to her new role.

Melvin is also working closely with Dr. Wetzel, as she will take over his undergraduate responsibilities (that is, whenever Dr. Wetzel decides to retire). If the Melvin name sounds familiar, that’s probably because Liz is married to assistant professor Adam Melvin.

FACULTY AWARDS & NEWS



Francisco Hung Receives 2014 LSU Rainmaker Award as an Emerging Scholar

As a top-tier research institution, LSU research faculty are proven leaders in their fields. The LSU Office of Research & Economic Development, with the support of Campus Federal Credit Union, takes the opportunity each year to acknowledge a few of the outstanding faculty with the Rainmaker Awards for Research and Creative Activity.

“Recognizing and celebrating our community’s outstanding faculty is important to Campus Federal, which is why we continue to invest in the future of the University through the LSU Rainmakers,” said Ron Moreau, Chief Development Officer at Campus Federal Credit Union.

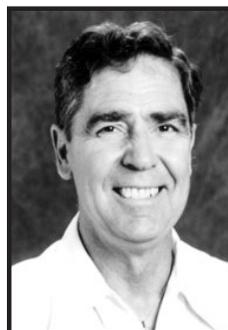
Faculty members chosen as Rainmakers are those who balance their responsibilities—which extend far beyond the classroom—with external expectations such as securing funding for their research and establishing the impact of their findings to the scholarly community and society as a whole. They garner both national and international recognition for their innovative research and creative scholarship, while also competing for external funding at the highest levels and attracting and mentoring exceptional graduate students.

“The LSU Rainmakers are exceptional leaders in their fields who bring national and international prominence to LSU. It is our pleasure to highlight these scholars with the support of Campus Federal Credit Union each year,” said Kalliat T. Valsaraj, Vice President of Research and Economic Development at LSU.

The 2014 Rainmakers are as follows:

- Megan Papesh: Department of Psychology, College of Humanities and Social Sciences; Arts, Humanities, and Social Sciences Emerging Scholar
- **Francisco Hung**: Cain Department of Chemical Engineering and Center for Computation and Technology; Science, Technology, Engineering, and Math Emerging Scholar
- James Matthew Fannin: Department of Agricultural Economics, LSU AgCenter; Arts, Humanities, and Social Sciences Mid-Career Scholar
- Parampreet Singh: Department of Physics and Astronomy, College of Science; Science, Technology, Engineering, and Math Mid-Career Scholar
- Ed Shihadeh: Department of Sociology, College of Humanities and Social Sciences; Arts, Humanities, and Social Sciences Senior Scholar
- James Moroney: Department of Biological Sciences, College of Science; Science, Technology, Engineering, and Math Senior Scholar

Hung, a Paul M. Horton associate professor in the Cain Department of Chemical Engineering, earned the CAREER Award from the National Science Foundation and the Ralph E. Powe Junior Faculty Enhancement Award. His research is focused on investigating different interfacial systems using computer simulations at the atomic and molecular level of detail.



Professor Emeritus Armando Corripio Inducted Into Process Automation Hall of Fame

Corripio, who was inducted into the Process Automation Hall of Fame this year, credits his involvement in process control to Paul Murrill (HOF 2014) and Cecil Smith (HOF 2009), with a nod to Fidel Castro. “I was near the end of my junior year in chemical engineering at the University of Villanueva in Cuba when

Castro decided to intervene [temporarily close] the university at the time of the Bay of Pigs invasion, in April 1961,” Corripio says. “One year later I was able to continue my education at LSU and got my bachelor’s degree in chemical engineering in 1963.”

On graduation, Corripio joined Dow Chemical Company’s Plaquemine facility. “They put me to work in automation and computer process simulation,” he says. “I was the first chemical engineer to work in automation at Dow, at least at the Louisiana Division.

Original article featured on the website “Control: Promoting Excellence in Process Automation,” www.controlglobal.com/articles/2015/.



Harry Toups Receives 2015 Tiger Athletic Foundation Michael R. Mangham College of Engineering Memorial Undergraduate Teaching Award

This \$1,000 cash award recognizes faculty who have been selected by their colleges or schools as outstanding teachers. Toups was recognized at this year’s annual LSU Distinguished Faculty Awards Ceremony, which was held on

Tuesday, May 5, at the Lod Cook Alumni Center.

“It’s nice to be recognized for doing something you love,” Toups said of receiving the award.

After a 30-year career in process development research and research support for a major energy company, Toups came to LSU with a burning vocation to teach. Having learned the ropes in his first few years here, he was asked to direct the Unit Operations Laboratory program and he hasn’t looked back since. In recent years, he’s emphasized the open-ended problem-based learning approach.



Sustaining Educational Excellence

Five faculty members from LSU's College of Engineering were awarded for their efforts to enhance the quality of entry-level courses in engineering, computer science, and construction management disciplines.

The **Award for Instructor Excellence**, which includes a \$5,500 one-time cash prize, is given to full-time college faculty members at the assistant professor rank or higher who have demonstrated teaching excellence in undergraduate courses. This is the first year the award has been presented. Recipients include:

- W. Todd Monroe, associate professor, Department of Biological and Agricultural Engineering
- Jin-Woo Choi, associate professor, Division of Electrical and Computer Engineering
- Nathan E. Brener, instructor, Division of Computer Science and Engineering
- Laura Ikuma, associate professor, Department of Mechanical and Industrial Engineering
- **Mike Benton**, associate professor, Cain Department of Chemical Engineering (Student Choice Award)

"Early year courses play a critical role in undergraduate retention and set the tone for our students' future success," said Richard Koubek, Interim Executive Vice President and Provost. "This award gives us the opportunity to recognize the unique contribution of our faculty who participate in the early years of a student's journey in the college."

A dean-appointed faculty committee selected the first four recipients based on candidates' peer recommendations, student success rates, student evaluations, and other metrics. Students

selected Benton through an online voting process.

In addition to the Dean's Award for Instructor Excellence, Benton was announced as the recipient of the **2015 Dow Chemical Excellence in Teaching Award**, which marks the third year in a row that he has received this award!

Balloting was conducted earlier in the semester, and all seniors who expected to graduate during 2014-15 were eligible to vote. Voters were instructed to identify their top three choices from the list of full, associate, and assistant professors. The ballots were then tabulated anonymously and the top three selections in order of overall preference were determined.

At the Senior Awards Dinner, hosted by Dow on May 1, 2015, each finalist was introduced by a student who recounted several of their experiences with the faculty member. The final results were then announced and every finalist was given a plaque to commemorate the event. In addition, Benton received a monetary award and his name was emblazoned on the plaque memorializing past recipients in the main hallway of the Chemical Engineering Building.

The Award for Instructor Excellence is part of the Dean's Fund for Instructor Excellence, established this year by 1963 petroleum engineering alumnus Harry Longwell. Longwell served as the first chairman of the LSU Petroleum Engineering Industry Advisory Committee and was inducted into the College's Hall of Distinction in 1990.

The Excellence in Teaching Award was started in 1988 with financial support from Dow Chemical USA, and is intended to recognize the chemical engineering professor that graduating seniors consider to be the most outstanding teacher in courses they have taken from the department during their time at LSU.

RESEARCH NEWS

Jerry Spivey & Team's Paper Takes Home Top Prize



An academic paper coauthored by researchers at LSU's College of Engineering and the U.S. Department of Energy's National Energy Technology Laboratory (NETL) has been named "Best Paper" by the editorial board of the *Journal of Applied Petrochemical Research*.

The award-winning paper discusses the characterization and activity of Rh-substituted pyrochlores for dry reforming, a process that converts natural gas and CO₂ to syngas, a mixture of carbon monoxide and hydrogen that's widely used in chemical industries. NETL and LSU are together studying the Department of Energy's patented pyrochlore catalyst technology for dry reforming reaction.

The paper is co-authored by current and former LSU students and professors, including Devendra Pakhare, a 2014 PhD graduate of the Cain Department of Chemical Engineering; Jerry Spivey, Pakhare's advisor; Savinay Narendra, a graduate student; and Daniel Haynes, a former master's student who now works at the U.S. Department of Energy.

"This paper exemplifies our joint research with NETL," Spivey said. "The catalysts we are working on are ones that require extremely demanding conditions."

In addition to the title recognition, the team received a certificate, a medal, and a \$5,000 cash prize. The award has also helped realize the commercial potential of the technology highlighted in the paper.

"[We] are finding commercial applications, such as fuel cells and other clean energy processes," Spivey explained.

NETL has executed an exclusive licensing agreement with Pyrochem Catalyst Corporation, a small business licensed by the U.S. Department of Energy, where Pakhare now works. NETL will collaborate with Pyrochem to further develop pyrochlore catalysts for use in fuel cell-based auxiliary power units and other commercial and military power applications.



SCIENTIFIC REPORTS

William Shelton Co-authored Paper Published in the Prestigious Journal "Scientific Reports," January 12, 2015 Improved All-Carbon Spintronic Device Design

The discovery of magnetism in carbon structures containing zigzag edges has stimulated new directions in the development and design of spintronic devices. However, many of the proposed structures are designed without incorporating a key phenomenon known as topological frustration, which leads to localized non-bonding states (free radicals), increasing chemical reactivity and instability. By applying graph theory, we demonstrate that topological frustrations can be avoided while simultaneously preserving spin ordering, thus providing alternative spintronic designs. Using tight-binding calculations, we show that all original functionality is not only maintained but also enhanced, resulting in the theoretically highest performing devices in the literature today. Furthermore, it is shown that eliminating armchair regions between zigzag edges significantly improves spintronic properties such as magnetic coupling.

Zachary Bullard¹, Eduardo Costa Girão², Jonathan R. Owens³, **William A. Shelton⁴**, Vincent Meunier^{1,3}

¹Materials Science and Engineering Department, Rensselaer Polytechnic Institute, Troy, NY 12180, USA

²Departamento de Física, Universidade Federal do Piauí, CEP 64049-550, Teresina, Piauí, Brazil

³Department of Physics, Applied Physics, and Astronomy, Rensselaer Polytechnic Institute, Troy, NY 12180, USA

⁴Cain Department of Chemical Engineering, Louisiana State University, Baton Rouge, LA 70803, USA

Bullard, Z., Girão, E.C., Owens, J.R., Shelton, W.A. & Meunier, V. *Sci. Rep.* 5, 7634; DOI:10.1038/Sr.ep07634 (2015).

Scientific Reports is an online, open access journal from the publishers of Nature. The 2014 Impact Factor for *Scientific Reports* is 5.578.



Ye Xu Co-authored Paper Published in the Prestigious Journal "Science," December 19, 2014

Catalytically active Au-O(OH)_x- species stabilized by alkali ions on zeolites and mesoporous oxides

We report that the addition of alkali ions (sodium or potassium) to gold on KLTL-zeolite and mesoporous MCM-41 silica stabilizes mononuclear gold in Au-O(OH)_x-(Na or K) ensembles. This single-site gold species is active for the low-temperature (<200°C) water-gas shift (WGS) reaction. Unexpectedly, gold is thus similar to platinum in creating –O linkages with more than eight alkali ions and establishing an active site on various supports. The intrinsic activity of the single-site gold species is the same on irreducible supports as on reducible ceria, iron oxide, and titania supports, apparently all sharing a common, similarly structured gold active site. This finding paves the way for using earth-abundant supports to disperse and stabilize precious metal atoms with alkali additives for the WGS and potentially other fuel-processing reactions.

Ming Yang¹, Sha Li², Yuan Wang¹, Jeffrey A. Herron², **Ye Xu**³, Lawrence F. Allard⁴, Sungsik Lee⁵, Jun Huang⁶, Manos Mavrikakis², Maria Flytzani-Stephanopoulos¹

¹Department of Chemical and Biological Engineering, Tufts University, Medford, MA

²Department of Chemical and Biological Engineering, University of Wisconsin–Madison, WI

³Cain Department of Chemical Engineering, Louisiana State University, Baton Rouge, LA

⁴Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN

⁵X-ray Science Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL

⁶School of Chemical and Biomolecular Engineering, University of Sydney, NSW 2006, Australia

Founded in 1880 on \$10,000 of seed money from the American inventor Thomas Edison, Science has grown to become the world's leading outlet for scientific news, commentary, and cutting-edge research, with the largest paid circulation of any peer-reviewed general-science journal. Through its print and online incarnations, Science reaches an estimated worldwide readership of more than one million. In content, too, the journal is truly international in scope; some 35 to 40 percent of the corresponding authors on its papers are based outside the United States. Its articles consistently rank among world's most cited research.

ChE Faculty & Graduate Students Publish Environmental Research Results



Louis Thibodeaux, although retired, continues to work and publish articles. He co-authored this paper with fellow ChE professors **K. Nandakumar** and **K.T. Valsaraj** (Vice President of Research and Economic Development), alum **Christopher Stevens** (MS 2014), and ChE PhD candidate **Abhijit Rao**.

This article is published in the journal "Environmental Engineering Science."

Sea Surface Oil Slick Light Component Vaporization and Heavy Residue Sinking: Binary Mixture Theory and Experimental Proof of Concept



Nandakumar

Valsaraj

Stevens

Rao

Christopher Clayton Stevens¹, **Louis J. Thibodeaux**¹, Edward B. Overton², **Kalliat T. Valsaraj**¹, **Krishnaswamy Nandakumar**¹, **Abhijit Rao**¹, Nan D. Walker³

¹Cain Department of Chemical Engineering, Departments of ²Environmental Sciences, ³Oceanography and Coastal Studies, Louisiana State University, Baton Rouge, LA

Abstract: This is a first of its kind study demonstrating that oil weathering can result in its sinking. Although a controversial proposition, oil's appearance on the sea floor following the 2010 Macondo 252 spill in the Gulf of Mexico and its large unaccountable volume has raised awareness of possible alternative explanations. Dragdown by settling particles is one known process. Another possible cause is heavy residue sinking due to density increase that follows the evaporation of the light constituents from the mixture. The study outcome impacts the field of oil spill modeling because confirmed mechanism-based process algorithms are required in the oil fate models. Theoretical and experimental studies on the proof of concept for the evaporation/sinking [EVAPOSINK] process were undertaken using binary chemical mixtures representing "model oils." Laboratory macrocosm-scale experiments with surface spills were performed and a theoretical, binary-component mathematical model was developed. Direct visual observations and physical/chemical measurements during both evaporation to air and heavy droplet sinking in the water column confirmed the process. Data obtained on oil component and bulk density concentrations tracked the time-series oil constituent chemodynamics within the slick and droplets. At the critical density the slick exceeded neutral buoyancy in water, after which a droplet formed underneath, broke away from the slick, and settled to the bottom. The drop was collected and physical/chemical measurements performed. Independent of the initial slick composition, the measured critical densities were 1.04 g/mL (–0.006) for fresh water and 1.07 for seawater. Dependent on initial composition, evaporation time to droplet formation varied from 200 to 2400 s. Data yielded evaporation rate kinetics required in the theoretical model. This light component mass transport coefficient ranged from 120 to 300 cm/h. The model correctly mimicked slick and droplet composition chemodynamic behavior patterns and density and drop-time measurements. Based on these positive outcomes the proof of concept was achieved.



Freeburgh

McCarroll

Rousseau

Westmoreland

Hulgan

Our Industrial Advisory Committee (IAC) is a driving force behind the success of our department. We would like to express our appreciation for their passion, commitment, and steadfast leadership.

2014-15 LSU Cain Department of Chemical Engineering Industrial Advisory Committee

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Baton Rouge Community College

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School of Chemical & Biomolecular Engineering
Georgia Institute of Technology

Dr. Phillip Westmoreland

Professor, Department of Chemical & Biomolecular Engineering
Executive Director, NCSU Institute for Computational Science & Engineering
North Carolina State University

2015 Graduate Recruitment Weekend



On Thursday, February 19, 2015, the graduate recruits arrived at the Baton Rouge Airport, where our current graduate students picked them up and brought them to their hotel. They ate lunch at Walk-Ons, a local restaurant, after which Aaron Harrington—LSU ChE Graduate Student Association President—took them on a guided tour of the LSU campus, as well as our CAMD facilities. The next morning, they enjoyed a meal in the Lawton Trophy Room and toured Tiger Stadium. Following the morning activities, the recruits took part in a Round Robin of faculty poster presentations and lab tours. Friday evening, they were treated to a Louisiana specialty, a good old-fashioned crawfish boil. After eating—and getting to know the faculty and current grad students—they traveled to Alex Box Stadium, where they watched LSU beat Boston College 7-4. Saturday, the recruits parted our company and returned to the airport, excited about their visit to our beautiful campus.



Promoting LSU ChE Abroad: Guatemala



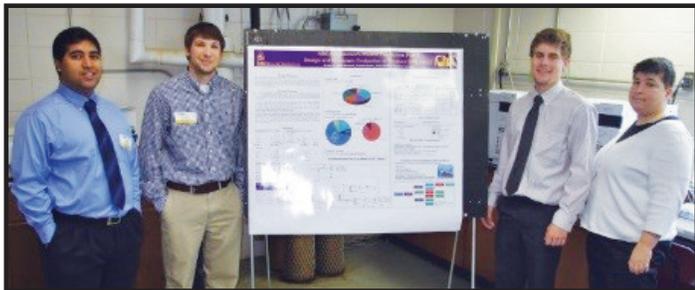
Santiago Salas (LSU ChE MS student & Fulbright scholar) and **Francisco Hung** (LSU ChE Associate Professor & Director of Graduate Studies) attended the XXI COLAEIQ (Congreso Latinoamericano de Estudiantes de Ingeniería Química, or Latin American Chemical Engineering Student Conference) in Antigua, Guatemala, July 27-31, 2015.

Salas and Hung promoted the ChE graduate program to undergraduate students from a number of Latin American countries and networked with faculty and students from several Central and South American chemical engineering schools. In addition, Salas taught a technical course and gave a research talk as part of this conference.



STUDENT AWARDS & NEWS

Junior/Senior Poster Presentations – April 2015



Kirtikar, Burns, Lorentz, Bertrand

The department would like to thank the 60 industry professionals (our biggest turn out yet)—and the companies they represent—who gave their time, energy, and thoughtfulness in judging this year's student participants. Without their efforts, the event would not have been such a success. In addition, the students enjoyed the chance to meet and greet some of Louisiana's best and brightest industry leaders.

Each year, juniors in CHE 3171 and seniors in CHE 4172 are placed in small groups and assigned a problem for which they must find a solution. During the semester, they work together to research the problem, prepare a solution to the problem, produce a poster demonstrating their solution, and present that poster to industry leaders and members of the ChE faculty.

This year, 24 groups of four or five juniors worked to determine the optimal temperature to carry out a C_4 alkylation process. Distillation of crude oil makes only 10-20% of the oil fit for use as gasoline motor fuel. Fluidized catalytic cracking breaks down higher molecular weight compounds in crude oil to more usable molecular weights. However, it produces compounds in the C_3/C_4 range that are not useful in the US markets. C_4 alkylation converts C_4 olefins to the desirable C_8 iso-paraffins for use in motor fuel. In a simplified scheme, the kinetics of the reaction is such that the selectivity to the higher value iso-octanes C_8 product (vs. C_{12} side products) is higher at lower temperatures, but to meet a specified production rate for the iso-octanes, a larger reactor and recycle column would be required at lower temperatures, incurring higher installation costs and changing utility requirements. An optimal solution was sought to maximize the net profit of this process. Overall, the industry judges were impressed.

Twenty-one groups of three or four seniors were asked to design a process for the production of phenol by oxidation of cumene followed by cleavage of the cumene hydroperoxide. Acetone and alpha-methyl styrene (AMS) are produced as by-products in the base case and the students have the option to either sell the AMS or hydrogenate it back to cumene depending on the economics. To work out this problem, seniors had to pull together and use all of the knowledge and skills they had learned during their chemical engineering education. As with the juniors, the judges were impressed with the seniors, scoring their posters with high marks and outstanding comments. However, there was one group that stood out and earned the Best Design Award for 2015: Laura Lyn Bertrand, Brandon Michael Burns, Amiel R. Kirtikar, and

Brandon Xavier Lorentz. Congratulations to them all for their outstanding work and dedication.

The Best Design Award is given each year to the team that scores the highest grade on the final design report. The report grade is based on the team's knowledge of the process, the justification of their design decisions, and their discussion of the process economics, environmental impact, and safety considerations.

Devendra Pakhare - LSU Alumni Association Distinguished Dissertation Award in Science, Technology, Engineering & Mathematics



“Catalytic Active Site, Mechanistic and Kinetic Studies of Dry (CO_2) Reforming of Methane over Lanthanum Zirconate ($La_2Zr_2O_7$) Pyrochlores” – Pakhare's dissertation studies the fundamental steps of the dry reforming of catalysts known as pyrochlores. The key to his work is understanding the inevitable deactivation of the catalyst due to carbon deposition and sintering due to the high temperatures required to reach equilibrium natural gas conversion. Thus there is a need to design and understand the catalyst with high thermal stability and resistance to carbon deposition. Pakhare studied transition metal substituted lanthanum zirconate ($La_2Zr_2O_7$) based pyrochlore catalysts for natural gas reforming.

The ability to selectively substitute specific atoms in the structure of the catalyst, while maintaining its thermal stability, is unusual. Pakhare performed fundamental studies on these materials to understand the active sites and determine why these materials show unparalleled performance towards natural gas reforming. His work was done in LSU laboratories and at two national labs (NETL and ORNL). This work has resulted in a licensed agreement to commercialize the process, and in eight publications in major scientific journals.

Pakhare received his BS in Chemical Technology in Mumbai, India. At LSU, he studied under the supervision of Professor James Spivey, receiving his PhD in Chemical Engineering in 2014. He is currently a staff scientist with Pyrochem Catalyst Company.

The LSU Alumni Association and the Graduate School sponsor the Distinguished Dissertation Awards, presented annually since 1983. The awards, also representing two categories, are given to doctoral students whose research and writing demonstrate superior scholarship. Graduates at any of the three commencements in a calendar year are eligible for nomination for the Distinguished Dissertation Awards. A committee of the graduate faculty selects the winning dissertations. Award recipients receive a monetary gift and a certificate of commendation.



By simulating the breaking waves in the lab and testing different dispersants used in the oil industry, Avij was able to present which dispersants work to reduce the amount of organic material released that harm the environment and which ones enhance the environmental effects of the spill.

Chemical engineering professor and Vice President of Research and Economic Development Kalliat Valsaraj said Avij's success comes from her innovative thinking and her dedication to tackling a complicated research area.

"Avij is investigating a certain relief mechanism from the surface of the ocean that has not been explored at all, and it's actually not even been considered in trying to find out how this oil matter gets released into the atmosphere," Valsaraj said. "What she has shown is that breaking waves are an important transport vector—I don't think anyone has really reported this in the past."

Avij, who came to the university from Iran specifically to work under Valsaraj, said her husband motivated her to enter the competition because, even though she's focused on chemical engineering, her research extends to the environmental and petroleum engineering fields.

Chemical engineering PhD student Aaron Harrington said Avij's ability to succeed in a competition outside the bounds of her primary discipline speaks on her work ethic.

"I think Avij is a wonderful example of women in engineering, which there aren't enough," Harrington said. "I know this is just the beginning—she's going to go on to do some really awesome stuff."

Avij said she's preparing for the regional competition by adding new information to complement her research. She said she is grateful for the resources and opportunities the university gives engineering students to further their research.

"I devoted most of my time to studying and doing literature review and have spent so much time doing experiments in the lab, and I'm so thankful for my adviser and our postdocs who help me a lot," Avij said. "The best thing a PhD student can have in her or his life is to see that her research is beneficial for the community and for people who are in charge to use it in the real world—hopefully people can benefit from what I've done for the past four years."

Making a Difference

Graduate students dream of their work being celebrated by industry leaders and academics alike. For chemical engineering PhD student **Paria Avij**, her research on the Deepwater Horizon oil spill is her reality.

Avij, ChE PhD candidate and research assistant, placed 2nd in this year's Society of Petroleum Engineers (SPE) student presentation contest here at LSU. The judges based their scores on a wide range of topics, including subject matter, delivery, and clarity of communication, and they found her research highly interesting and very useful for the oil industry. She qualified to move on to the regional competition that was held at Penn State on April 26, 2015.

"It will be a really great honor for me to be a representative of LSU in this region," Avij said. "Hopefully, I can show that LSU is doing very dynamic research that contributes to oil response operations among other things."

Avij's research looks at how breaking waves, the white caps of thousands of bubbles that come toward the beach, is transporting oil and dispersant materials into the atmosphere.

STUDENT AWARDS & NEWS



LSU Chemical Engineering Junior Kurt Ristroph & Associate Professor Carlos Astete Use Soy Bean Leaves for Their Research

The university encourages undergraduates to seek experience in their fields before graduation, and for

chemical engineering junior Kurt Ristroph, his big opportunity came in the tiniest of packages.

Ristroph joined a research team, led by biological and agricultural engineering associate professor Cristina Sabliov and assistant professor Carlos Astete, specializing in developing more efficient ways to improve people's health using nanotechnology.

"Nanoscale is defined, in terms of size, as anything less than 100 nanometers," Sabliov said. "We're working to develop biodegradable delivery systems at the nanoscale to be applied in the areas of food, health, and agriculture." Ristroph joined the research team in January 2014, while Sabliov was on sabbatical in Romania. At first, he helped out by editing Astete's research papers and grant applications.

"It wasn't really science work at first, but it was good research exposure," Ristroph said. "I learned there was a specific format a researcher has to follow if they want to get their research published."

When Sabliov returned fall 2014, Ristroph was given more opportunities, putting aside paperwork to help create nanoparticles for the team's research.

The research team's work looks at creating nanoparticles to entrap vitamins and other drugs to increase the efficacy in which the chemical works.

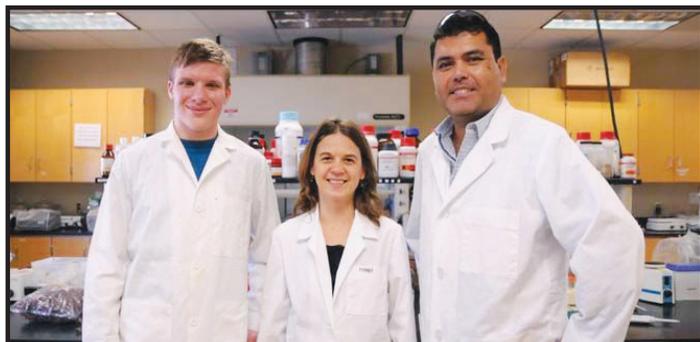
With food, Sabliov is looking at entrapping vitamins, and other nutrients, in order to make it easier for these nutrients to withstand degradation in the stomach.

In health research, these nanodelivery systems can open doors for certain medicines to be ingested orally rather than through an IV or a shot.

"If we can trap medicine, like insulin, in these particles, you can protect it so it can reach the parts of the body it's meant to reach, making the drug more effective," Astete said. "Right now, you have to do insulin shots because insulin is degraded in the stomach if ingested. But with this type of nanotechnology, you could make oral ingestion possible."

Sabliov is also looking to entrap pesticides into a nanoparticle that withstands harsh weather conditions in order to reduce spraying in the farming industry.

"What I like about what we do is that you can take all of this research and apply it to many fields," Sabliov said. "What makes this exciting work is that we see endless opportunities for our research to help society."



Ristroph, Sabliov, Astete

Ristroph is grateful for the opportunity to receive hands-on experience, doing cutting-edge research on campus alongside the professors who teach him.

"[Sabliov] consistently gives me opportunities to say yes to things," Ristroph said. "She gives me chances to do projects, whether it's working on soybeans, which is a big research area, or other things. She had me make a website for the lab group which was a lot of fun."

Ristroph, who hopes to become a professor, encourages students to not be afraid to approach their professors and ask them about getting involved in their research.

This year, Ristroph was selected as a university choice to apply for the Barry Goldwater Scholarship and Excellence in Education Program, a \$7,500 scholarship for juniors and seniors. Only four students per university are allowed to apply.

"If you're the kind of person that can go out there and offer your help to professors, they will see your initiative," Ristroph said. "Never be afraid to take that first step, because that's the type of person professors want in their labs."



Women in Engineering: Eva C. Caspary

Before her six-month internship at BASF in Geismar, LA, Eva C. Caspary had never been to the United States, let alone a small industry town in Louisiana.

"It was a culture shock," said Caspary, a graduate student in the Cain Department of Chemical Engineering who is originally from Germany. "But Louisiana was a great place to come for my first time. Everybody took great care of me, and everybody at BASF wanted me to learn something from my experience and not just let me sit there."

STUDENT AWARDS & NEWS

Caspary worked at the chemical production company from August 2008 to March 2009 to fulfill her undergraduate internship requirement, which she opted to do abroad. During that time, she worked with wastewater treatment using a Fenton's reagent, a solution of hydrogen peroxide and an iron catalyst used to oxidize contaminants.

"The project I worked on, after two or three years, was actually realized in real life and is now part of the plant," she said. "It was really exciting."

So exciting, in fact, the experience motivated Caspary to continue her education at Louisiana State University. She always knew she wanted a higher degree, she said, noting she "just wasn't satisfied after my bachelor's degree," but the internship was the "little nudge" she needed to apply.

"The only program I applied to was the PhD program at LSU," she recalled. "I didn't even have a Plan B because if that hadn't happened, I probably would have just gotten my master's in Germany. I was able to get my PhD right away at LSU, and that was quite big for me."

After the internship, she returned to Germany to complete her degree in process engineering at Hochschule Mannheim, known in English as the Mannheim University of Applied Sciences. Immediately after graduation, she returned to the Bayou State.

Now, Caspary is in the final stretch of her doctoral research, examining the formation of polycyclic aromatic hydrocarbons, or PAHs, by pyrolyzing a known model fuel and analyzing the products of this fuel.

"It's like solving a little riddle," she says. "We know what we put in, we see what comes out, and we're trying to retrace the steps it took to get there. PAH can be formed from pyrolytic reactions in combustion processes, and they are known pollutants, and they're also carcinogenic or mutagenic, or some of them are, and we want to understand how they're formed, so that other people can understand how to not make them form anymore."

She estimates she has about two more years until her work is complete, and her passion for engineering is every bit as strong as it was when she started.

"It's been really rewarding," she said. "Not only does [graduate school] teach you a lot about how to scientifically address problems, it teaches you a lot about yourself: how far you can go, what your borders are. That's something I'm happy to learn in this environment so I can apply that later on in my job."

But it's not a field for anyone who isn't committed to the science, she advises.

"If you're doing a PhD, it's important for people to know the interest has to be there," she said. "This becomes your life. This is a job you take home. You think about it day and night. This is your baby."



Evan Andrews Receives Clayton Engineering Excellence Award for Outstanding PhD Graduate Students

Andrews is working towards a PhD in Chemical Engineering. Under the direction of Dr. John Flake, his research focus is the electrochemical reduction of CO₂, particularly focusing on nanoparticle catalysts. Andrews was born in the US, but completed high school in New Zealand. Before coming to LSU, he received his BS in Chemical Engineering from Case Western.

The Clayton Engineering Excellence Award for Outstanding Graduate Students is granted each year to an outstanding graduate student(s) who exhibits extraordinary character, scholastic achievement and evident leadership in the College of Engineering. This award entails a stipend of \$10,000 to the recipient and a \$2,000 stipend to the graduate student's principal advisor/faculty member.

Donald W. Clayton (BS PETE 1959) was inducted into the College of Engineering Hall of Distinction in 1993. He and Gloria Pichon Clayton founded the awards in 2004 with a generous donation.



Aubrey Heath Earns Student Presenter Award

Heath, ChE PhD candidate and research assistant, earned a Student Presenter Award at the 249th American Chemical Society's (ACS) National Meeting and Exposition held in Denver, CO. She was recognized for her tireless research efforts by the sponsors of the Chemical Processes at Environmental Interfaces Symposium. (Heath has since received her PhD, graduating in August 2015.)



Alexander Nadler Recognized with 2015 Student Award from the American Institute of Chemists

Nadler's professors selected him on behalf of LSU for demonstrating leadership, character, scholastic achievement, and advancement potential in the chemical professions.

The Student Award from the American Institute of Chemists honors outstanding graduating students majoring in the field of chemistry, chemical engineering, and/or biochemistry.

From its earliest days in 1923 to the present, The American Institute of Chemists has fostered the advancement of the chemical profession in the United States.

STUDENT AWARDS & NEWS



The Future of Communication

Motivated by a shared desire to refine their communication skills and learn discipline-specific approaches to communication that would enable them to excel in their chosen professions, chemical engineering undergraduate students **Kelly O'Quinn** and **Amiel R. Kirtikar** completed the LSU Distinguished Communicator Certification program and were honored as LSU graduates and Distinguished Communicators at LSU's spring 2015 commencement ceremony.

The LSU Distinguished Communicator Certification program, the first of its kind in the nation, is a unique academic excellence program that recognizes students who demonstrate exemplary levels of communication skills during their undergraduate years. Candidates undergo a variety of training experiences and are required to build a digital portfolio, demonstrating proficiency in written, spoken, visual, and technological communication. They must also show successful use of their communication skills in leadership roles and community service.

Upon completion of the program, these students possess the competitive skills and knowledge needed for 21st century leadership. This coveted designation becomes part of official transcripts and gives the certified graduate significant leverage in today's job market. LSU is one of the only universities in the country recognizing students who excel in communicating within their discipline.

In addition to the Distinguished Communicator Certification, Kirtikar also received the **2015 Warren N. Waggenspack Jr. Leadership Legacy Award**.

The Warren N. Waggenspack Jr. Leadership Legacy Award is the highest award achievable for the Peer Mentor Program of the LSU College of Engineering. It is given to graduating seniors who, through their activities and interactions, not only visibly demonstrate the values of respect, integrity, and accountability of the Society of Peer Mentors, but have also made a lasting impact on the program and the College of Engineering.

BASF Awards \$10,000 in Scholarships to Four LSU ChE Students 2014-15



Stephen Hurdle

Garrett Lambert

Rachel Nguyen

Matthew Skapura

Each year, BASF awards scholarships in the spring and fall as part of the BASF Team Chemistry Scholarship Fund. This year they awarded \$10,000 in scholarships to four LSU chemical engineering students. Each student received a \$2,500 scholarship from BASF. Recipients have maintained 4.0 GPAs and are active in campus and community organizations.

“BASF considers LSU and the School of Engineering to be our partners in preparing the next generation of engineers, scientists, and industry leaders,” said Tom Yura, Senior Vice President and Manager of the BASF site in Geismar, LA. “BASF’s scholarship program is a way to reward students who excel in their studies, and it encourages them to learn more about careers in our industry.”

Stephen Hurdle of Baton Rouge is a junior chemical engineering major and a Catalysis Lab assistant at LSU. He volunteers with the Society of St. Vincent de Paul at the Bishop Ott Shelter for Men and is a member of the American Institute of Chemical Engineers.

Garrett Lambert of Luling is a junior chemical engineering major. His work experience includes interning at Valero and Monsanto for the past two summers.

Rachel Nguyen is a junior chemical engineering major and an undergraduate research assistant. She is involved in the American Institute of Chemical Engineers and volunteers in the community through Volunteer LSU and the Honors College. She is from Lake Jackson, TX.

Matthew Skapura is a junior majoring in chemical engineering. He participates in Phi Gamma Delta fraternity and works as a College of Engineering research assistant under the direction of professor Judy Wornat and Dr. Nimesh Poddar. Through his significant contributions to the LSU Chemical Engineering Department research team, Skapura earned the honor of presenting his work at the recent International Symposium on Combustion in San Francisco, CA. His hobbies include intramural soccer and volunteer work.

“We appreciate BASF’s continued support of LSU’s College of Engineering and its students,” said Rick Koubek, Interim Executive Vice President and Provost. “In addition to scholarships, the company’s donation of \$1 million to establish the BASF Sustainable Living Lab as part of the new LSU College of Engineering building will provide opportunities for students to gain real-world experience through design projects and other programs that help prepare them for careers.”

BASF Corporation, headquartered in Florham Park, NJ, is the North American affiliate of BASF SE, Ludwigshafen, Germany. BASF has more than 17,000 employees in North America, and had sales of \$20.6 billion in 2014. BASF’s manufacturing presence near LSU includes operations in Geismar, the corporation’s largest site in North America, Zachary, and Vidalia. BASF employs a workforce of around 2,000 people in Louisiana and invests nearly \$300 million in the state through annual payroll, purchases, taxes, and charitable contributions.

Departmental Awards



Victoria A. Bourgeois Receives 2015 Jesse Coates Award

Bourgeois was presented with both the Jesse Coates Award and an engraved watch at the department’s 2015 Undergraduate Awards Banquet. The Coates Award is voted on by all ChE faculty and is given to a student who exemplifies both academic integrity and leadership in extracurricular endeavors.

In addition to the Jesse Coates Award, Bourgeois also received the **2015 Chemical Engineering Junior Award** for holding the highest GPA at the end of the semester in which 90 hours are completed.

Fourteen ChE Students Receive 2015 Senior Awards

The Senior Award is given to graduating seniors that complete the program in four years with no dropped courses. This year’s recipients were Victoria A. Bourgeois, Scott R. Curtis, Samuel J. Eastman, Michael P. Firman, William W. Fruge, Chris L. Galli, Jason Katz, Michael F. Kelley Jr., Anias R. Lowe, Ryan E. Monk, Ramzy A. Muhsen, Kelly R. O’Quinn, Jonathan R. Sellers, and Xin Shu.

SCHOLARSHIPS

2014-15 Undergraduate Scholarship Recipients

AICHe Best Junior Scholarship

Robert Quiring

Alan M. Raymond Endowed Scholarship

Frank Fincher, Morgan Broussard, Natalie Burges

American Society of Sugar Cane Technologists

Seleipiri Charles, Nicholas Graves, Daniel Hulgán, Delaney Sheehan, Kevin Whitaker, Matthew Blanchard, Victoria Bourgeois, Giuliano Campesi, Chase Ellefson, Matthew Faucheux, Nathan Grotte, Matthew Skapura

Baker Hughes Endowed Scholarship

Shannon Matzke

Baker Hughes Scholarship in Chemical Engineering

Thomas O'Brien, Tori Sechrist, Adex Cantu, Dillon Hooter, Samuel Eastman, Ryan Monk, Thomas Rockwell, Frank Turk, Chelsea Bourdon, Mingwei He, Tre' Daze', Adam Marchand, Ryan Pfefferle, Jonathan Sellers, Andrew Williamson, Sulaiman Al Rawahi, Seleipiri Charles, Michael Kelley, Trey Faucheux, Ramzy Muhsen, Taylor Sanford, Lauren Westholz, Brandon Boyett, Luke Holloway, Victoria Dugas, David Melancon, Emily Rinaldi, Jacob Templet, Jeremy Alcanzare, Anna Goebel, Chance Daigle, Paige Mallalieu

BASF Team Chemistry Scholarship

Matthew Skapura, Stephen Hurdle, Garrett Lambert, Rachel Nguyen

Bettie Conley Helis Scholarship

Breanna Lee

BP Minority Engineering Scholarship

Alexandra Gulino, Sami Marchand, Amanda Ourso, Caroline Pearson, Jacqueline Samson, Lauren Westholz, Abigail Burcham

BP Scholarship for Energy in Engineering #2

Abigail Erwin, Abbey Hotard, Allen Huang

Celanese Chemistry

Sam Boyer

Chemical Engineering General Scholarship

Joshua Baldassarò, Cole Billeaud, John Boyce, Sam Boyer, Lexie Breaux, Seleipiri Charles, Anne Cooper, Ashley Curran, Joseph Devereux, Chinedum Emelobe, David Englehardt, Gage Fos, Ragan Gauthier, David Gauthreaux, Mark Graham, Nicholas Graves, Sean Guillory, Eva Hidalgo, Andrew Issa, Jeremy Laiche, I-Ting Liu, Jeff Mauras, Leandre Millet, Ryan Monk, Thomas O'Brien, Karisha Olson, Sabrina Ordoyne, Precious Orji, Garrett Osborne, Amanda Ourso, Ana Perez, Ryan Pfefferle, Joshua Saltz, Mary Schoolfield, Zachary Webb, Brennan West

Chevron Texaco Scholarship in Chemical Engineering

Lauren MacKenzie, Daniel Hulgán, Rebecca Andries, Quinn Dotson, Nathan Grotte, Kaitlyn Nixon

CITGO Petroleum Scholarship in Chemical Engineering

Kurt Ristorph, Brooke Pendergast

Clara and Frank R. Groves Sr. Engineering Scholarship

Robert Quiring, Ragan Gauthier

Clayton Engineering Excellence Award for Outstanding Undergraduate Student

Matthew Skapura

College of Engineering Alumni Scholarship

Rebecca Andries, Mark Bandy, Lindsay Blouin, John Fleming, Kevin Kirchner, Garrett Lambert, Rebecca Taylor

College of Engineering General Scholarship

Victoria Croft

Donald F. Othmer Sophomore Academic Excellence Award

Kurt Ristorph

Donald W. Clayton Engineering Excellence Scholarship

Matthew Skapura

Eugene R. Cox Scholarship

Timothy Montet, Ryan Jesina, Jacob Ieyoub, David Rau, Kaitlyn Nixon

ExxonMobil Diversity Scholarship

Aleshia Hector, Amiel Kirtikar, Breanna Lee, Hannah Pittman, Jeremy Wade, Cameron Williams

Floyd S. Edmiston Jr. Endowed Memorial Scholarship

Stefan Wojkowski, Brandon Lorentz, Anais Lowe

Gene Perdue Lowe Scholarship

Jeff Mauras, Rebecca Andries, Nathan Grotte, Shelby Rochelle, Beau Plaisance, Eva Hidalgo, Anne Cooper, Quinn Dotson, Caroline Limbaugh, Lexie Breaux, Laura Guillory, Kaitlyn Nixon, Gabriel Alarcon-Caine, Rachel Devall, Mary Schoolfield, Jacob Hingle, Kristopher Clavin, Jonathan Gardner, Matthew Blanchard, Giuliano Campesi, Travis Dugas, Chase Ellefson, Matthew Faucheux, Cara Leger, Timothy McMahan, Christopher Reed, Ellis Sartain, Zachary Sirera, Jon Wilson

Gerard Family Undergraduate Scholarship

Allen Huang, Victoria Bourgeois, Justin Katz

Hermann Schluter Family Scholarship

Timothy McMahan

Honors College Service Award

Kurt Ristorph

Houston-LSU Engineering Scholarship

Natalie Burges

Jesse Coates Memorial Scholarship

Tanner Martin

Leo Broering Memorial Scholarship

Chaning Simmons, Robert Quiring

Leonel E. Tustison and Helen L. Tustison Scholarship

Ashten Landry, Kendall Gaudin

SCHOLARSHIPS

Mable and Boykin W. Pegues Scholarship

Jeremy Alcanzare, Victoria Dugas, Jonathan Gardner, Aleshia Hector, Daniel Hulgán, Caroline Limbaugh, Ellis Sartain, Edward Thistlethwaite, Abigail Burcham, Michael Denham, Grant Landwehr, Kurt Ristroph

Marathon Oil Minority Scholarship

Gabriel Alarcon-Caine, Bethany Sarabia

NACME Scholarship

Amiel Kirtikar, Andrew Peterson, Bethany Sarabia, Jade Sorrell, Daniel Vilchez

O. Dewitt Duncan Jr. Endowed Scholarship

Matthew Aguilar, Taylor Cavalier, Cody Martin, Allison Simms, Abigail Burcham, Breanna Lee, Sarah Mills, Michelle Bayona, Michael Fertitta, Tanner Martin, Edward Thistlethwaite, Megan Bush, Sami Marchand, Alexander Nadler, Dillian Beechler, William Fruge, Zachary McDaniel, Kevin Whittaker

Outstanding Honors College Sophomore

Kurt Ristroph

Patrick F. Taylor Scholarship in Engineering

Rebecca Austin, Abigail Burcham, Natalie Burges, Caroline Limbaugh, Devin Manning, Malhory Mire

Paul M. Horton Memorial Undergraduate Scholarship

Anna Hoying, Jon Wilson, Ricardo Aguilar, Andrew Issa, Brian Stumpe, Stacey Wieseneck, Wayne Wortmann

Paul N. Howell Endowed Memorial Scholarship

Jessica Gilbert, Xin Shu, Mary-Claire Kanyha, Blair Rispone

Penelope W. and E. Roe Stamps IV Leadership Scholars Award

Faiz Alam

Ram N. Bhatia

Aamani Kura

Roger Hadfield Ogden Leaders Fellowship

Kurt Ristroph

R. L. Hartman Memorial Scholarship

Brandon Burns, Kelly O'Quinn

S & B Engineers Brookshire Scholarship in Engineering

Channing Simmons, Zachary Webb, Jade Bates, Dylan Bernard, Breanna Lee

Shell Engineering Ambassador Scholarship

Kristin Ellis

Shell Honors Student Leaders Scholarship

Catherine Albano, Katie Como

Sophomore Honors Distinction

Jeremy Baldassarro, Lexie Breaux, Kurt Ristroph, Joshua Saltz

Thomas H. Hopkins Scholarship

Michael Denham, Natalia Kotwani, August Vidacovich

Walter C. Middleton Jr. Endowed Scholarship

Scott Curtis, Jade Bates, Max Garcia

William E. McFatter Endowed Scholarship

Mindy Duong, Jonathan Gardner

2014-15 Graduate Scholarship & Award Recipients

W. Barrett Ainsworth – William A. Brookshire Distinguished Fellowship in Chemical Engineering

Evan Andrews – Clayton Engineering Excellence Award for Outstanding PhD Graduate Student

Paria Avij – Coates Travel Award – 2nd place Society of Petroleum Engineers student presentation contest

Eva Caspary – Gordon A. and Mary Cain Graduate Assistantship

Jorge Chebeir – Fulbright Fellowship

Yuwu Chen – Coates Travel Award

Xun Cheng – Materials Science and Engineering Graduate Assistantship

Daniel de Oliveira – Science Without Borders Fellowship – George A. Daniels Graduate Fellowship

Aryan Geraili Nejadfomeshi – Coates Travel Award

Aaron Harrington – Flagship Graduate Assistantship – Clayton Engineering Excellence Award for Outstanding Graduate Students

Aubrey Heath – William A. Brookshire Distinguished Fellowship in Chemical Engineering – Graduate School Scholars Program – Coates Travel Award – Student Presenter Award 2015 American Chemical Society National Meeting

S. “Venky” Kalpathy – Gordon A. and Mary Cain Graduate Assistantship – Coates Travel Award

C. “Eddie” Lane – Dissertation Year Fellowship

Devendra Pakhare – 2014 LSU Distinguished Dissertation Award in Science and Engineering

Abhijit Rao – Coates Travel Award

Santiago Salas – Fulbright Fellowship

E. “Allie” Southerland – LA Board of Regents Fellowship – George A. Daniels Graduate Fellowship

Michael Thomas – Clayton Engineering Excellence Award for Outstanding Graduate Students – Flagship Graduate Assistantship – Coates Travel Award

Zenghui Zhang – Dissertation Year Fellowship – Coates Travel Award

COMMENCEMENT

Summer 2014 Commencement

Doctor of Philosophy in Chemical Engineering

Rui Li

Fall 2014 Commencement

Doctor of Philosophy in Chemical Engineering

Joel Niño Galvez Bugayong

Yuehao Li

Yijie Shen

Master of Science in Chemical Engineering

Khiet Le Thanh Mai

Harsha Satyanarayana Vempati

Bachelor of Science in Chemical Engineering

Alexis Marie Ackerman

Hannah Claire Bergeron

Chelsea Anne Bourdon

Brandon Mintz Boyett

Aubyn Maryee Chavez

Jen-Peng Chiao

Marcel Thomas Delaune

Kelsey Lynn Duracher

Trey Matthew Faucheux

George William Gruber IV

Mingwei He

Luke Everett Holloway

Dillon Scott Hooter

Jeff Zhefu Lieu

David Joseph Melancon Jr.

Ryan Matthew Ormerod

Emily Maria Rinaldi

Thomas Mark Rockwell

Taylor George Sanford

Tori Alexandra Sechrist

Frank Joseph Turk

Spring 2015 Commencement

Doctor of Philosophy in Chemical Engineering

Aryan Geraili Nejadfomeshi

Master of Science in Chemical Engineering

Jorge Asis Charbel Chebeir

Garrett Wilson Dupre

Navid Ghadipasha

Gongqiang He

Bachelor of Science in Chemical Engineering

Matthew Joseph Aguilar

Solomon Anye Angwafo

Paul Arthur

Shelbi Nicole Baham

Michelle Bernadette Bayona

Alexa Rae Booth

Victoria Alice Bourgeois

Corey Jace Broussard

Morgan Lynn Broussard

Brandon Michael Burns

Megan Elyse Bush

Charles Richard Caballero

Adex Mario Cantú

Lisa Angela Congiundi

Eric Paul Cunningham

Scott Ross Curtis

Chance Paul Daigle

Cooper E. Daigle

Cole Hutson Daughdrill

Tre' James Daze'

Victoria Grace Dugas

Samuel John Eastman

Michael Gerard Fertitta

Michael Patrick Firmin

William Watkins Fruge

Max Daniel Garcia

Ragan Alexander Gauthier

Rogelio Javier Gomez-Pineiro

Robert William Helou

Derek Manning James

Mary-Claire Suzanne Kanyha

Justin Parker Katz

James Scott Keck

Michael Francis Kelley Jr.

Amiel R. Kirtikar

Brandon Xavier Lorentz

Anaïs Renée Lowe

Paige Lindsay Mallalieu

Paul Thomas Maloney

Adam Paul Marchand

Cody Alexander Martin

Ryan Edmund Monk

Ramzy Abdel Muhsen

Alexander John Nadler

Kelly Robin O'Quinn

Ryan Charles Pfefferle

Nicole Lynn Poteet

Katherine Credeur Ramsey

Julie Ann Robbins

Walter Adam Scott

Jonathan Robert Sellers

Xin Shu

Miranda Taylor Smith

Jacob Paul Templett

Andrew Dixon Williamson

Stefan Andrew Wojkowski





David M. Mongrue Inducted into CoE Hall of Distinction

Mongrue (BS ChE 1978) is Vice President of Operations at the Dow Chemical Company for Acrylics and Coatings, Discrete Manufacturing, and EO Envelopes. He is also a member of the company's Operations Leadership Team. His responsibilities include operations at more than 150 sites in 37 countries.

Mongrue began his career in 1979 in manufacturing at the St. Charles Operations site in Louisiana. He climbed the ranks, holding a series of manufacturing engineer and technical lead positions at the St. Charles and Texas City operations sites, before becoming the business manufacturing leader for the ethyleneamines, ethanolamines, alkylalkanolamines, gas treating, and heat transfer fluids business units. He later served in various other leadership roles in Connecticut, Michigan, Texas, and Pennsylvania—even Saudi Arabia.

He serves as the Dow executive for LSU, a member of the LSU College of Engineering Advisory Council, and a board member for the LSU College of Engineering Building campaign, among other community leadership roles.

“My passion for engineering and learning have enabled me to contribute to my company and society in general beyond my imagination,” he wrote in his reflection. “I hope the legacy I leave is that I enabled the people I worked with to be better than they would have been otherwise.”

Mongrue lives in Baton Rouge with his wife, Susan, and their three children.

In 1979, the College of Engineering established the Hall of Distinction to recognize individuals who have made significant contributions to the engineering profession. Seven charter members were elected in 1979, and generally, two achievers in engineering have been added each year since.

Criteria for election include distinguished professional achievement, dedicated service to engineering, and outstanding humanitarian activities. Eligibility is not limited to LSU alumni, although it is expected that nominees will have had some connection with and show interest in LSU. Nominations may be made by anyone, and are solicited each year from alumni, faculty, and friends of the college. Election to the Hall of Distinction is by a broadly constituted ten-member Board of Election, which reviews and acts on nominations.

In the past, the engineers elected to the Hall of Distinction have come from widely varied backgrounds from the highest levels of engineering research to the top management of multinational corporations.

In honoring these people, the College of Engineering feels that it is, at the same time, honoring all those engineers whose contributions, although not all visible to the public, are nonetheless significant and collectively exemplify engineering as a profession unparalleled in its contributions to society.

Oscar “Dub” Andras Inducted into LSU’s Society for Engineering Excellence



On October 23, 2014, the LSU College of Engineering inducted new alumni and friends into the Society for Engineering Excellence. Each member helps ensure the college is positioned to educate the best future engineers through their philanthropic commitment to support students, faculty, and research.

“The generosity of LSU’s Society for Engineering Excellence members is integral in providing state-of-the-art resources to educate the next generation of computer scientists, construction managers, and engineers,” said Rick Koubek, Interim Executive Vice President and Provost. “As champions of our program, the members’ association also helps propel the college’s research initiatives and recruit top faculty.”

2014 LSU College of Engineering’s Society for Engineering Excellence inductees:

- **Oscar “Dub” Andras**—a 1957 chemical engineering alumnus—and his wife, Mary, of the Andras Foundation, have been strong supporters of the Cain Department of Chemical Engineering.
- BASF Corporation, a strategic partner that has supported scholarships, professorships, and student organization initiatives, recently announced a contribution to establish a sustainable living laboratory, the first of its kind at LSU and the southeast region.
- Rene R. Joyce, a 1970 mechanical engineering alumnus and the executive chairman of Targa Resources, and his wife, Kay, have endorsed the engineering campus expansion.
- The Guidry Foundation was established by Mark and the late Carolyn Guidry, and their children and spouses: Gayle and John Dilley, Mike and Barbara Guidry, and David and Jennifer Guidry. The Guidry Foundation presented transformative contributions for the Division of Electrical and Computer Engineering and the College of Engineering.
- MMR Group, Inc. provided a philanthropic gift to establish two new laboratories: a building simulation and information modeling studio and an advanced materials

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and methods laboratory. The labs will help prepare LSU construction management students for career advancement.

- James “Pepper” Rutland, president, MMR Group, Inc. and 1972 LSU construction technology alumnus remarked about joining the society. “MMR is proud to join this esteemed group who support LSU’s College of Engineering and its mission to deliver a world class education in an environment that promotes innovation and leadership.”

Founded in 2008, LSU’s Society for Engineering Excellence is comprised of members who have made lifetime commitments of \$1 million or more to LSU’s College of Engineering.

Oil Spill Inspires Chemical Engineering Alumna Mollie Burke to Focus on Safety



Prompted by the immense affect that the oil spill had on her home state, 2013 chemical engineering alumna and Louisiana native, Mollie Burke, decided to take a career path guaranteed to make a difference.

Burke is currently employed as a Process Safety Engineer for Chevron Global Upstream and Gas in Houston, TX.

“Process safety is a cross-functional responsibility involving designing quality, consistent, and safe operating facilities with the collaboration of engineering, operations, and safety,” she said. “I have always wanted a rewarding and challenging career where I have an opportunity to make a difference.”

Burke’s main responsibilities include supporting Chevron’s Global Upstream and Gas business units in managing change and risk in facilities and operations. She coordinates a forum that allows Upstream advisors to share best practices and develop risk-based solutions.

“At work, I am involved in developing tools and resources to help my company better execute safety processes and assess risk,” she explained. “For example, when assessing risk, there are tools that can estimate the potential severity of consequences from process safety spills and releases, as well as how much could be released. This helps people better evaluate risks and what safeguards are in place or needed for risk reduction. I also provide process support to help business units effectively execute these safety processes. This can include providing training and analyzing metrics that measure the process’s health.”

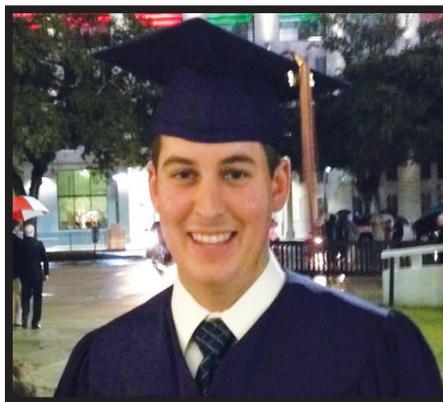
Burke credits LSU’s College of Engineering professors for ensuring engineering students know “safety first.” “Professors at LSU reinforced safety through stories of their own experiences and reinforced safety during our engineering labs as well,” Burke said.

As a student, Burke interned at Chevron and conducted a data study to help identify improvement opportunities in the personal and process safety space.

Burke initially chose LSU chemical engineering because it has a wide range of opportunity spanning various industries, she said. The idea of working at the field level or at a home base intrigued her.

“A degree in chemical engineering isn’t limiting,” she said. “The opportunities available upon graduation are endless.”

Frank Turk - 4th Generation LSU ChE Graduate



Frank Joseph Turk received his BS in Chemical Engineering in fall 2014. Turk is part of four generations to receive a chemical engineering degree from LSU.

Frank Paul Turk, June 1934
Frank Paul Turk Jr., June 1957
Fredrick Joseph Turk, May 1983
Frank Joseph Turk, December 2014

Honoring the Tradition He Began

When Leo Comeaux received his BS in Chemical Engineering from LSU in 1955, he was a first-generation college student unknowingly beginning a legacy. His father's education had ended in third grade, but would be followed by the educational success of the elder Comeaux son and grandchildren.

Of Leo Comeaux's four children, his three daughters continued in his footsteps to receive their chemical engineering degrees. This past spring, Comeaux's granddaughter followed suit.

"He's been a big inspiration for us," Comeaux's youngest daughter, Tricia Delaney, shared. "All of us felt our parents were very instrumental in keeping academics in front of us."

As Comeaux's 80th birthday approached, Delaney, her sisters, and their brother, Michael, who graduated from the Air Force Academy, decided to honor their father with a chemical engineering scholarship in his name. "We wanted to give back to the school in a meaningful way," Delaney said, explaining that all three sisters attended LSU on scholarships. "LSU was obviously very good to the three of us. It's a tradition, and it's family. LSU, in a very big way, is part of our family."

Delaney and her sisters, Lori Annestrand and Lisa Vander Laan, were able to use ExxonMobil's 3-to-1 charitable matching program to maximize their dollars. Delaney and Vander Laan, plus all three sisters' husbands, are ExxonMobil employees, and Annestrand is a former employee. "They make it very easy to give," Delaney said.

The scholarship will be awarded to a chemical engineering student from Louisiana, a requirement that Delaney said reflects their father's past.

"We're all hoping to continue a young person's education and help them achieve their goals in what we think is a very honorable and valuable profession."

Comeaux shared that LSU provided him with the opportunity for an affordable education and the foundation for his career. To have a scholarship named after him provides a meaningful way to ensure his family's legacy at LSU continues for generations. "I was really touched by what they did," he said. "I feel privileged to have children like that."



ALUMNI INTERVIEWS



Erika Capone received her BS in Chemical Engineering fall 2011 and is currently an environmental engineer at Chicago Bridge and Iron in Houston, TX.

Were you a declared engineering major when you were first enrolled at LSU? I was an engineering major from start to finish! With my love for math and science, I knew it was what I wanted to do, especially chemical engineering.

Did you feel you were at a disadvantage being a female engineering student? I honestly did not feel I was treated any differently as a female engineering student. Fortunately, my class of chemical engineers had a good amount of female students. I never felt like I was in a male dominated field of study. We were all treated the same and graded fairly. It made no difference whether we were male or female, which said a lot about the LSU chemical engineering program. It was also refreshing to know that the amazing women I graduated with were all paving the way for young girls to study engineering and not feel like a minority.

Why do you think there is such a difference in enrollment numbers for male and females in engineering? I wish the enrollment numbers of females in engineering were higher. Girls lose interest in math and science at such a young age. It isn't "cool" to study those things and be smart. It is so important that girls know this is something they can do and keep them interested.

When did you realize your interest in math and science? I've always had an interest in math. It has always come very easy to me so I enjoy doing it. My first chemistry class in high school was when I learned to love science. A lot of it had to do with how hands-on science can be—something about watching chemical reactions happen in front of you is so much more interesting than reading about it in a book.

Once you graduated, how did the job market treat you? I'd say that the job market is definitely one of the things female engineers have on our side. Because engineering is such a male-dominated industry, a lot of companies are looking to hire females. Having a job lined up by graduation was not an issue.

What is your current role at Chicago Bridge and Iron? I'm an environmental engineer. I do consulting work for oil and gas companies mainly. I deal with developing air permits and handling environmental compliance tasks for our clients.

Do you have a personal plan to expand the workforce of younger female engineers? Recently, I was able to volunteer my time at a CB&I event where we got to do fun projects related to math and science with elementary age girls along with other female coworkers. We talked with them about what we do and, hopefully, were able to get them more interested in becoming an engineer one day.

What advice would you give to female engineering students who are just starting school, applying for internships, or applying for jobs? Advice I would give to female engineering students would be just to study hard and do your best. Keep at it and don't give up. It is really tough, and you'll see other girls in different majors with a lot more free time on their hands, but it will be worth it.



Dr. Thomas Scherr received his PhD in Chemical Engineering in spring 2014 and is currently a postdoctoral research scholar in the Department of Biomedical Engineering in Vanderbilt University.

Where are you from? Originally I am from Baltimore, MD. I did my undergrad in the University of Delaware.

What brought you to do this research? What is it about this that interested you?

It's really a long story how I ended up down at LSU. I really liked the faculty in the ChE department. And biological applications weren't even potential projects when I first got here. It was really my advisor that I started working for, I really wanted to work for him. And I was really interested in biology and biological applications of chemical engineering and he reached out and created this kind of collaboration with Dr. Todd Monroe, who was my co-advisor. So it was kind of a joint project that really was developed out of a need from the biology side and kind of a desire from the chemical engineering side.

How was your experience at LSU? It was great! It was really fantastic. What led me down here was when I came to visit, it's a funny story. I was scheduled to come visit and they had this entire day planned out for me on Friday and there was a tropical storm that came through, and I was delayed in Atlanta for seven hours. And so they asked me, "Is there anyone you wanted to meet with? Professors? We'll see if they can come in on Saturday." They emailed a few of the professors and four professors that I asked to meet with came out on Saturday. And I found out that some of them drove thirty to forty minutes just to come and meet with a kid that they had never met before. I thought that was such a welcoming gesture. And then, talking to the professors, I really liked what they were doing, the environment around there is very conducive, very collaborative, to doing good work. I really enjoyed it there.

Moving forward what kind of research would you like to do? I definitely want to stay on biological applications. There are a lot of medical needs that devices like these can handle. Even though our project has been on cryopreservation and the analysis of cells, I still learn a lot of fundamental things about how microchips and microchannels operate—you get a sense of how good they are after working with them. I really want to go into portable diagnostics. Being able to take a channel like this—because these are cheap and inexpensive to make—we can go into remote locations and start detecting diseases or poor health conditions. That is something that's kind of a critical need, not just in developing countries, but even here. Commercial medical products, like point-of-care diagnostics, may be a far ways away but, 20 years from now, what can you learn? Imagine, being able to go to the store—instead of a doctor's office—and have your finger pricked and the blood analyzed. There's a lot you can learn from a drop of blood going through those channels.

I think another really interesting thing is cell phone programming. The computer chips on your cell phones are more powerful than what flew the first spaceship to the moon. They have more computing power than that. So, is there a way that you can harness that computational power?

IN MEMORIAM

We were saddened to learn of the passing of the following alumni. We extend our belated condolences to their families and friends.



Jeremiah William "Jerry" Affolter Jr. passed away on December 18, 2014. Born March 4, 1920, in Parkersburg, WV, Jerry was a long-time resident of Baton Rouge, having graduated from LSU in the class of 1942 and worked for 40 years at Exxon Baton Rouge. After his retirement, he did consulting work worldwide. Jerry was preceded in death by his parents Mr.

and Mrs. Jerry W. Affolter Sr., his son, Jay Affolter, his wife, Betty Meade, and his sister and brother-in-law, Mr. and Mrs. Ralph W. Netser (Louise Affolter). He is survived by his daughter Anne Affolter Morse and her husband, James; daughter Jane Affolter Simmons and Randolph Hunter; son David Affolter and his wife, Janet; grandchildren: David Morse and his wife, Jennifer, Elizabeth Morse, and Sylvain Nuz; Mellie Preis Bailey and her husband, Trevor; and Wolfe Washauer and his wife, Kate; and eight great grandchildren: Andrew, Matthew, and Brandon Morse; Rafe and Wade Bailey; and Caroline and Eleanor Washauer; Annabelle Morse Nuz; and a cousin, Cathy Collett Kelley and her husband, Tom. From the time he arrived in Baton Rouge to attend LSU, Jerry was and remained an avid Tiger fan and devoted alum. His dedication to LSU included endowment of the Department of Chemical Engineering Jay Affolter Endowed Professorship, and the establishment of a scholarship in memory of his wife. He also was a member of the LSU Foundation Laureate Society and the George M. Graham Laureate Society, and he was a recipient of the LSU Alumni Association Purple & Gold Award for outstanding philanthropy and service to the Association and Louisiana State University; He also worked on behalf of the College of Engineering, helping to procure special equipment and supporting connections between Exxon and engineering students. In 1970, he received the A.B. Patterson Award for Outstanding Management in Engineering in Louisiana. His accomplishments and volunteer efforts were not limited to LSU and Engineering; however, he began work in the early 1950s with Kiwanis, the Boy Scouts, and United Way. As a member of First United Methodist Church, he was a dedicated usher, board member, and participant in Kairos Prison Ministry. His work elsewhere in the community included serving on the charter Board of Directors of Woman's Hospital, where he also served two terms as Chairman. Throughout his years at Exxon and after retirement, he volunteered in East Baton Rouge Parish Schools, especially with VIPs, where he was a reader/mentor well into his 80s. An avid hunter and fisherman in his earlier years, Jerry saw these as the only real competitors with LSU football.

Published in TheAdvocate.com from December 30, 2014, to January 3, 2015. For more information visit www.obits.theadvocate.com/obituaries/theadvocate/.



Albert Troy "A.T." Furr, a resident of Baker and a native of Port Arthur, TX, passed away on Tuesday, December 23, 2014, at Lane Regional Medical Center. He was 92, and proudly served as a First Lieutenant in the United States Army Ordnance in the Persian Gulf during World War II. A.T. was a great patriot who loved the Lord. He was a member of the Gideons, and faithfully served as a Deacon of First Baptist Church for many years. He served on the EBR Parish School Board, the Baker City Council, and was formerly on the Board of Directors of Hancock Bank. A.T. obtained a BS in Chemical Engineering from LSU in 1947, and retired from Exxon Plastics. A.T. is survived by his wife, Martha Bishop Furr; daughter, Lana Lucille Furr Griffin and her husband, Cary; two step-daughters, Martie Kwasny and her husband, John, and Myra Penn and her husband, Mike; three sons, Troy Douglas Furr and his wife, Betty, Thomas Lee Furr and his wife, Susan, and Roger Dale Furr; four step-sons, Andy Bishop and his wife, Robbie, Ricky Bishop and his wife, Karen, Tim Bishop and his wife, Debbie, and Spencer Bishop and his wife, LuAnn; a sister, Edith Nell Furr Achee; a brother, Donovan Crews Furr and his wife, Lois; 31 grandchildren; and 25 great-grandchildren. A.T. was preceded in death by his first wife, Norma Watson Furr; brother-in-law, Charles A. Achee; and his parents, Albert T. Furr Sr. and Jessie Maie Crews Furr. Pallbearers will be Troy Douglas Furr, Tommy Furr, Roger Furr, Andy Bishop, Ricky Bishop, Spencer Bishop, and Cary Griffin.

Published in TheAdvocate.com from December 23-25, 2014. For more information visit www.obits.theadvocate.com/obituaries/theadvocate/.



Nicholas R. Kubiak, age 24, passed away on Saturday, February 21, 2015, in Illinois, formerly of Louisiana and Pittsburgh. Loving son of Mary Catherine (Amrhein) and Raymond Louis Kubiak Jr.; best friend and brother of Joshua Moses Kubiak; he will be missed by numerous aunts, uncles, cousins, and friends. Nick received his BS in Chemical Engineering from LSU in 2014 and was beginning a successful career as a chemical engineer for Marathon Oil in Robinson, IL.

Published in Pittsburgh Post-Gazette from February 26-27, 2015. For more information visit www.legacy.com/obituaries/postgazette/obituary.aspx?pid=174257731.

John Mark Stafford was called home by his Savior on Sunday, November 16, 2014, at the age of 55. Mark was an avid outdoorsman and a loving husband and father. He is survived by his wife of 31 years, Diane Gamble Stafford, and children Rachel Stafford and Joshua Stafford. He was a lifetime resident of Baton Rouge, a graduate of Woodlawn High School and LSU (BS ChE 1982). He retired from Total Petrochemicals. He will be greatly missed by his sister, Siobhan Brooks, and brothers, Andrew Stafford and Timothy Stafford, and also his brothers-in-law; Michael Gamble and David Gamble; along with his nieces and nephews.

Published in TheAdvocate.com from November 16-19, 2014. For more information visit www.obits.theadvocate.com/obituaries/theadvocate/.

ALUMNI SPOTLIGHT



Claire Cagnolatti—More than an Alumna

For many, Christmas is a time for giving to those you hold most dear. But when you have eight siblings to shop for, it can be a bit much.

Nearly a decade ago, the Cagnolatti children replaced giving to each other with giving back. They take turns choosing a charity to receive their pooled monetary gifts. When it was Claire's turn, she chose purple and gold.

Having previously established a scholarship with her brothers to honor their father, the two-time LSU alumna (BS ChE 1978, MBA 1982) decided to begin an elementary education scholarship in their mother's name. Last Christmas, the siblings were able to put \$12,000 toward the Clara Sevin Cagnolatti Scholarship fund, and several have pledged to give annually.

Cagnolatti has faithfully supported LSU for 26 years, including a planned gift, but it wasn't until she served as the Dallas area chairperson for the Forever LSU Campaign that she fully understood the options for larger gifts. "It may be difficult for someone to come up with a \$25,000 check," she explained, touting the benefits of corporate matching gift programs. "A small pledge of a couple of hundred dollars a month could make you a \$25,000 donor."

A gift to the new Tiger Band Hall was Cagnolatti's first pledge. "We needed a new band hall in the 70s when I was there," she said, explaining the urgency.

Next, she made a five-year, \$25,000 commitment to the College of Engineering's Breaking New Ground campaign—specifically, to support construction of the chemical engineering annex, the department from which she, her father, one of her brothers, and her nephew all graduated. The new building will provide better facilities that she says will "maintain the standard" of quality education she received at LSU.

"I never lose sight of the fact that my LSU education is what prepared me for this career," said Cagnolatti, Vice President of Chemical Studies at Solomon Associates. "And I feel very blessed to have been successful at it."

Cagnolatti shared that she receives a letter from a recipient of her father's scholarship every year.

"When you read a note that says, 'I may have never even been able to attempt to afford school had it not been for this scholarship,' that is a feeling money cannot buy," she said. "This is an investment in the future. It changes lives."

Cagnolatti's passion for the university is deeply rooted in her family's ties to LSU. "It's a feeling. It's an integrated part of our lives," she shared. "I give because it's more than just my alma mater. It's a family tradition."

Featured Alumni



Dr. Robert Forest (BS 2010) completed his PhD in Chemical Engineering at the University of Delaware spring 2015. His dissertation was entitled “Diffusion of Sodium in Copper Indium Gallium Diselenide Related Materials.” He joined Bristol-Myers Squibb summer 2015.

Forest is the son of Jerry (BS 1984) and Sharron (BS 1983) Forest of Lake Charles.



Dr. Stephen M. Griffies (BS 1986) is currently working as a research physical scientist for the NOAA Geophysical Fluid Dynamics Lab, in Princeton, NJ. After graduating from LSU, he enrolled in Northwestern University, where he received an MS in Engineering Sciences and Applied Mathematics. He then enrolled in the University of Washington to study physics as an undergraduate student. With that education, he enrolled in the University of Pennsylvania, where—in 1993—he earned a PhD in Theoretical Physics, specifically high energy theory. From there, he served as a post-doctoral research scientist at Princeton University from 1993-96. Griffies’ research activities include: research into the ocean’s role in climate and climate change; sea level; interactions between ocean and hurricanes; Southern Ocean dynamics; fundamental physical ocean processes related to mixing and turbulence; and numerical models of the global ocean.

If you want to learn more about Dr. Griffies, visit <http://www.gfdl.noaa.gov/stephen-griffies-homepage>.

In our last Newsletter, Dr. Louis Thibodeaux shared his article “Etienne de Boré’s Sugar Kettle: A sweet chemical engineering story.” Many people enjoyed it, and several alumni and friends sent their thanks for his time and effort in producing the historical retelling. Here are two of the thank you messages that he received:

I want to say thank you for a very nice article in December 11’s CHE News. I grew up on a sugar cane farm and currently work at Audubon Sugar under Dr. Harold Birkett. I also walked by the kettle many times when we were still located on campus and didn’t think too much about it. It just so happens that I am now reading Creole Families of New Orleans (1921) by Grace Elizabeth King and so, of course, am interested in the Creoles of Louisiana book that you referenced. I’ve forwarded the link to your article to a few people that I know will enjoy it as much as I did. Again, thank you for taking the time to write it.

Regards,
Jeanie Stein

I just finished your article on this history of the kettle and wanted to drop a note letting you know how much I enjoyed it. It brought back memories of my wife and me supersaturating molasses solutions in 1982, then watching under a microscope for crystallization so that we could develop saturation curves in sugar lab! Running that old sugar factory was a lot of fun and we learned so much. Thanks again for the article, and Merry Christmas/Happy New Year.

Best Regards,
Jerry Forest
Global Process Safety Manager



ALUMNI FEEDBACK

In a few cases, Thibodeaux's story conjured up so many memories from the past that alumni felt a desire to put pen to paper and write their own stories about Louisiana, its sugary past, and—of course—LSU! Here are two of the stories that he received after his story was published:

Sugar Lab

by Jerry Forest (BS 1984)

Reading Dr. Thibodeaux's article on Etienne de Boré and the famous sugar kettle that rests outside of the Chemical Engineering Building brought back memories of my undergraduate career at LSU. In 1982, chemical engineering students had a choice of taking unit operations lab or sugar lab. At the time, I was dating my future wife, Sherry Woodall, and we both decided to take sugar lab thinking that it would give us "real world" experience by operating a full scale sugar refinery.

As expected, we did indeed gain that "real world" experience. The factory was complete with equipment to chop and squeeze the cane, heat exchangers, pumps, crystallizers, evaporators, and jets. It was in this lab that I had my first real lessons in both occupational and process safety and developed my love for production.

In addition to actually running the factory and making sugar, a major part of this course was to complete some type of lab work. After consulting with our professor, Dr. Robinson, Sherry and I decided to attempt to make saturation curves for molasses. You see, in the 1980s, the science of crystallization had not advanced beyond the "pinch test." That is, before a batch of sugar could progress beyond the evaporators to the crystallizer, an operator would "pinch" the solution. If the sugar/molasses mixture created a string about an inch long, it was ready.

As we soon learned, it is no easy task to make saturation curves for molasses. It involves taking molasses and heating to various temperatures. When at the desired temperature, we would then supersaturate the solution with sugar. As you might well imagine, this process took forever, as molasses already contains a good deal of sugar. When our mixture was ready, we then placed a sample under a microscope. As the mixture cooled we would record the temperature at which the first crystal of sugar became visible.

It took the entire semester to get a dozen data points! The fact that Sherry and I were dating at the time made this arduous task bearable.

Another interesting fact about this time frame is that there was a huge industry crash in 1983 and 1984. Very few of us

had interviews—much less jobs. I was fortunate enough to have been given two offers in December of 1983, which were rescinded by May 1984, my graduation date. After teaching high school physics for a semester, one of the companies came back with the original offer.

Shortly after accepting, I received a call from the Robinson Sugar Company. Our sugar lab professor, Dr. Robinson, had forwarded a copy of our saturation of sucrose in molasses report. They were so impressed by it that they offered me a plant trip to Hawaii! To get a feel for just how bad things were in 1984, I turned down the plant trip so as to avoid any complications with my newly accepted job. Boy, was I young and naive!

To complete this story, at the end of the semester of sugar lab, we each received about two cups of raw sugar that we produced. Sherry and I made oatmeal cookies with our sugar. They were the worst cookies I've ever had!

Jerry is a 1984 graduate of LSU with a BS in Chemical Engineering. He also has an MPS from Loyola and an MBA from LSU. After working in isocyanates, hydrazine propellants, and refining for the last 30 years, he is now the Global Process Safety Manger for Celanese. His wife, Sherry (BS ChE 1983), is a professor at UTMB (after several degrees in a different field) and son Bobby (BS ChE 2010) completed his PhD in Chemical Engineering at the University of Delaware spring 2015 and joined Bristol-Myers Squibb summer 2015.

Reflections

by Joe Landry (MS 1963, PhD 1966)

Louis - I had drafted this a couple of months back, but it's really a personal story and doesn't add much to Mr. Boré's story, but thought you'd be interested.

There was a sugar mill not more than 100 yards from our little shotgun house in the Louisiana countryside in the St. Martin sugar cane region. The fall was a magical moment and, like one of my longtime friends, I always looked forward to it. For 1) it meant going back to school and out of the cotton fields and 2) the end of the back-breaking summer heat.

Seems that the Catholic holiday All Saints Day was the key time when all sugar cane processing began. Once harvesting started it was a race to harvest all your crops before the first freeze came to Louisiana. With sugar cane left in the fields, the freeze would stop all growth and the sugar content of the cane would start to drop.

I remember one fall evening (when I was still small enough that Dad could carry me on his shoulders) we walked to the sugar mill—probably to settle up for cane he had hauled that day. Guess he had it together that evening, as he took the time to tell me how it all worked, where the cane came in, how it was crushed, and where the juice went in the sugar pans.

Of course it was all steam and the motive power behind the crusher was a steam engine. As he walked me around so I could see the engine, I saw these two metal balls spinning in the air on the engine and I was led to understand what the principle was, the extent of the balls path was inversely proportioned to the steam valve opening, it was ‘a governor,’ ah my first introduction to control and feedback.

My dad and I walked up two levels and were able to see the cane juice boiling in one of the sugar pans. If you’re living in South Louisiana everyone has one of these pans—although many are faux pans in his yard now a days. Oh, the aroma of boiling syrup was delicious.

On the lower level, three or four women were working that evening packaging the syrup in a short assembly line. The syrup was packaged in one quart cans, similar to what Steen’s sells its cane syrup in the stores. There was no need for automation in those days. Each was filled by estimate.

I’m told the real treat was to have fresh French bread, a baguette, to eat with fresh syrup. The nose of the French baguette, now called the heel in our dialect, made a perfect cone holder for syrup and homemade heavy cream. Not a lot of heart attacks since, in my theory, the farmers burned off all the cholesterol with the hard physical work they did.

Many of my relatives worked the sugar mills, with the biggest one being still in operation near St. John. It was called Levert St. John, with the president of the coop being one of my sugar cane farmer cousins. This is more than a syrup mill in that it makes the best raw cane sugar. My father, two uncles, and my grandfather all worked there at one time or the other.

Some jobs were very stressful like the one my uncle Steve had. At the time he was called the “floor walker” and walk he did. It was great to take the tour of the mill with him. Once all

the moving parts were going ok and he could take me around and show different things. His temperament was such that if things were in the ditch and parts were all in synch you didn’t approach him.

One particular piece of equipment requiring the most horsepower was the crushers. A series of opposing grooved cylinders driven by the large horizontal Corliss steam engine. Some people use the 10- or 15-foot gear wheels as yard art—see Burden LLL Museum. The huge fly wheel was so large in diameter it had its very own pit so that all the heavy machinery was at ground level. The fly wheel was driven by a steam piston that moved back and forth with what seemed to be a 15-foot stroke. I remember lots of parts of the sugar mill were made in gleaming brass or bronze and the oiler going around like they did for steam locomotive, adding a shot of oil to the moving parts. This engine had a Corliss governor like the first engine I saw only much larger. It turns out Mr. Corliss invented the valve but became famous for the engine and made many of the engines.

There it all was some of the first chemical engineering in the U—so I was told by professors at LSU—and it had four of the five categories of Chemical Engineering Unit Operations.

- Fluid Flow...transportation and filtration
- Heat Transfer...evaporation, condensation, and heat exchange
- Mass Transfer...extraction, absorption, and drying
- Thermodynamic processes...none of these
- Mechanical processing...transportation, crushing, screening, and sieving

Open Call for Stories

With the new Chemical Engineering Building on the way, the faculty and staff of the Cain Department of Chemical Engineering would like to invite our alumni to submit stories about their time here at LSU, particularly stories that involve the two buildings that have served the department for over thirty years. Yes, we’re moving, but we will always have fond memories and nostalgic feelings for these buildings that were a second home to so many of our alumni. So please, submit your stories to Rachel Landry (relandry@lsu.edu) or Frank Blystad (fblyst13@lsu.edu), and then look for them in our next edition of the Alumni Newsletter.

OPPORTUNITY TO GIVE

SUPPORTING LSU CHEMICAL ENGINEERING

The Cain Department of Chemical Engineering is committed to delivering the highest possible educational experience to its students. To further that end, we invite all who would like to share in this commitment to contribute to the Chemical Engineering Development Fund. These funds are used to support instructors with industrial experience for labs; new faculty start-up costs; equipment, computers, and supplies for undergraduate labs; and numerous other endeavors.

Our alumni, friends, and other supporters are critical to the success of our department and we are grateful for the generous gifts that we continue to receive in support of our academic programs.

You can make a gift online through the LSU Foundation's secure online giving site via www.che.lsu.edu/support. Pledge your support by selecting "Make a Gift Now."

If you prefer to mail your gift, please make checks payable to "LSU Foundation" and note in the memo line the area you would like to support (e.g., Chemical Engineering Development Fund, Chemical Engineering Faculty Development Fund, Chemical Engineering Undergraduate Lab Support Fund, Chemical Engineering Equipment Fund, Chemical Engineering Scholarship Fund, Graduate Assistant Fellowship). Mail to:

Dr. John C. Flake, Interim Chair
Cain Department of Chemical Engineering
Louisiana State University
Baton Rouge, LA 70803

STAY CONNECTED

The Cain Department of Chemical Engineering values our esteemed alumni and would like to connect with you! We would enjoy hearing about your first job, new job, promotions, accomplishments, and/or other significant events in your life. If you would like to share your achievements with us, or if you'd simply like to update your contact information, please complete our online update form at www.che.lsu.edu/alumni/connect. Thank you for your continued support and best of luck in your future endeavors!







College of
Engineering
Cain Department of
Chemical Engineering
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Baton Rouge, LA 70803

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Comments and suggestions should be directed to:
Rachel Landry, *Editor* Frank Blystad, *Co-Editor*
relandry@lsu.edu fblyst13@lsu.edu