CHEMICAL ENGINEERING

Alumni Newsletter • Volume 29 • Fall 2014

LSU College of Engineering
Cain Department of Chemical Engineering

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Letter from the Chair

Mary Julia (Judy) Wornat
Robert Hughes Harvey Professor
William G. Reymond Professor
Department Chair

Dear Alumni and Friends:

November 17, 2014, was a milestone day for the LSU Cain Department of Chemical Engineering!

Thanks to the generous support, tireless work, and immense dedication of many Department of Chemical Engineering alumni and friends—as well as their counterparts across LSU's College of Engineering—the Breaking New Ground campaign exceeded its $50 million goal, permitting access to the state's dollar-for-dollar matching funds. The result: on November 17, LSU broke ground on the new chemical engineering building, to be part of LSU's expanded and renovated engineering complex! New state-of-the-art laboratories and classrooms are on the way!

To all of you who had a part in making this happen, THANK YOU! The future for Chemical Engineering at LSU is looking very bright!

Best Wishes,

BREAKING NEW GROUND

LSU leadership, major supporters of the College, and key stakeholders "turn the dirt" at the ground breaking ceremony

Monday, November 17, 2014, Governor Bobby Jindal, LSU President and Chancellor F. King Alexander, and LSU College of Engineering Dean Rick Koubek joined honored guests to officially break ground on the $110 million renovation of Patrick F. Taylor Hall and construction of a chemical engineering addition. Once finished, the expanded facility will be one of the largest free-standing engineering buildings in the US.

Scheduled for completion in fall 2017, the total amount of academic space for the LSU College of Engineering impacted by this project will be 462,150 square feet. The new and renovated engineering complex will include expanded, modern laboratory space for teaching and translational 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 a 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.

"On this historic day for the LSU College of Engineering, we break ground on the future of education and research," said Rick Koubek, Dean, College of Engineering. "This new facility will not only provide a contemporary environment for computer scientists, construction managers, and engineers to learn, it will inspire a culture of innovation among students and researchers working to solve the world's toughest engineering challenges. We thank the Jindal Administration, the state legislature, and the more than 500 alumni, donors, and companies who helped to make this project a reality."

Initiated by a public-private partnership, Governor Bobby Jindal announced his administration's support of the College's expansion with $50 million in capital outlay funding for the project on October 12, 2012, provided the College raised the remaining funds through private donations.

In response, the Breaking New Ground capital campaign was launched publicly on April 20, 2013, with a $15 million gift commitment from Phyllis M. Taylor to honor the legacy of Patrick F. Taylor.

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

The cover image is of the laboratory and residence of the LSU sugar experiment station at Audubon Park in 1899. This image is part of the LSU Photograph Collection, Audubon Sugar School, Louisiana and Lower Mississippi Valley Collections.

LSU

LSU IS AN EQUAL OPPORTUNITY/ACCESS UNIVERSITY

Faculty Awards & News

Mike Benton was announced as the recipient of the 2014 DOW Chemical Excellence in Teaching Award for the second year in a row at this year's Senior Awards dinner hosted by Dow May 1.

Associate professors **Francisco Hung** and **David Wetzel** were also recognized as finalists for the award (for the second year in a row as well).

Balloting was conducted earlier in the semester, and all seniors who expected to graduate in 2014 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.

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 emblazened on the plaque memorilizing past recipients in the main hallway of the Chemical Engineering Building.

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. In 2010, the selection process was modified to include recognition of three finalists for the award.

David Wetzel was awarded the 2013 Tiger Athletic Foundation (TAF) Undergraduate Teaching Award.

Ten College of Engineering faculty received the award, which annually recognizes full-time faculty members for extraordinary classroom teaching. In choosing award recipients, TAF considers nominees' impact on—and involvement with—students, contributions to the profession of teaching, and a focus on scholarship in teaching and learning.

Jose Romagnoli, along with two colleagues (P. Sharma and B.R. Sarker), was awarded the Computers & Chemical Engineering Most Cited Articles, 2010-12 Articles, 2010-12 Award for the paper "A decision support tool for strategic planning of sustainable biorefineries."

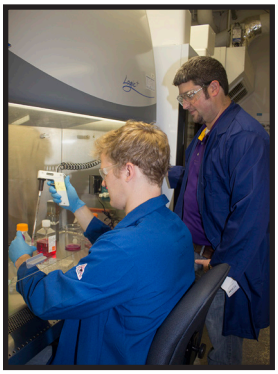
Abstract: In this paper we formulate, implement, and test a model for technology and product portfolio design for a multi-product multi-platform biorefining enterprise. The model considered is a mixed-integer linear program (MILP) financial planning model with the objective of maximizing the stakeholder value. Integer variables are used to select appropriate feedstocks, technologies, and products; material and capacity balances are used to design capacity and set production targets; while cash balances are used to describe investment and operations financing. Stakeholder value is described as the shareholder value with monetized environmental implications in terms of emissions mitigation costs and credits. Process integration schemes utilizing emissions are considered to reduce the emissions load and add to the bottom-line. A preliminary process design and product portfolio is provided as a result. Advantages of process integration are quantified using a central utilities facility and effluent recycles. Sensitivity analysis is conducted to determine important parameters that shape the objective function.

Martin Hjortsø and **Louis Thibodeaux** will be retiring in December 2014.

With over six decades of teaching service at LSU between them, Martin A. Hjortsø and Louis J. Thibodeaux will retire on December 19, 2014. Both men touched the lives of thousands of students over the years and helped mold the minds of many great men and women. And so, it is with great pride that we can say we were able to work side-by-side with such esteemed men. It is with joy that we wish them happiness in the next chapter of their lives. Finally, it is with a touch of sadness that we bid adieu to Martin and Louis. We thank each of them for their years of dedicated service, but most of all we thank them for being a part of—and enhancing—our lives for so many years.

"At LSU we are pioneering a new model of research and development. Leveraging our intellectual network, the College of Engineering is embracing purpose driven, translational research."

-Rick Koubek, Dean, College of Engineering



Adam Melvin was recognized by the College of Engineering for his outstanding research efforts.

After observing a physician specializing in the treatment of multiple myeloma, one of the things that struck Melvin was the delta between treatment success and failure. The other problem he noticed was patients' increasing resistance to single drug treatments.

One of the limitations in contemporary cancer diagnosis today is doctors' broad approach to treatment. Physicians have only limited information to make decisions about individual patients. "Biopsies capture a fairly small amount of cell tissue inadequate to get a clear picture of the true dynamics of each individual cancer cell," says Melvin. "Cancer lives in a very heterogeneous environment. There are healthy cells, benign cells and cancerous cells to varying degrees." People undergo the treatment regime with their fingers crossed, not knowing if they will be helped or harmed. He likens it to eliminating the grading curve in a class of 150 students–no matter how well or poor a student's performance, everyone earns the same grade. We treat cancer much in the same way. It's a one size fits all approach.

However, according to Melvin, no two cancers are exactly alike because no two people share the same genetic profile. Today, common medical practice calls for a biopsy of the tumor. In much more sophisticated diagnostics, doctors may opt to map the genome of the cancer to understand the minute differences in the DNA of the cancer cells compared to a patient's healthy cells. The results lead to a tailored treatment that targets the tumor's mutations. This method of diagnosis and treatment is often very effective, but also costly and time consuming.

While still a long way off from commercialization, Melvin's research holds great promise in providing personalized cancer treatment tailored to the particular characteristics of each patient's cancer.

In addition to personalized cancer care, his research is applicable in early stage drug testing. Melvin says, "By testing drugs at the cellular level, we can determine how cells will respond to the new drug, if at all." This technology could allow pharmaceutical companies to rapidly advance to Stage III drug testing by quickly eliminating treatments that will not perform in clinical trials.

K. Nandakumar was announced as one of five principal investigators on an Intel grant for open-source software development.

Through the grant from Intel, LSU Center for Computation & Technology (CCT) will work to develop open-source software focusing on simulation of flows through micropores, such as those found in rocks involved in oil and gas extraction, by extending OpenFOAM, a popular open-source simulation software.

"LSU is proud to be recognized as an Intel Parallel Computing Center [IPCC]," said Honggao Liu, Deputy Director, CCT. "At CCT, we use high-performance computing to unite experts in numerous fields of study. This grant and multi-disciplinary project will allow us to better understand and solve issues within this critical software. Working with Intel not only benefits LSU by giving us access to Intel's vast expertise, but it also benefits each of the departments involved in the project as well as those who will be able to use the enhancements we work to develop."

In becoming an IPCC, LSU joins other universities in the country including Georgia Institute of Technology, Purdue University, University of Tennessee, and University of Texas at Austin's Texas Advanced Computing Center, among others.

The LSU IPCC will work to scale, optimize, and profile the performance of OpenFOAM software, which is used on Intel Xeon Phi coprocessors such as those installed in SuperMIC, LSU's newest 1-PF class Intel Xeon Phi coprocessor-equipped high-performance computing, or HPC, cluster.

The work will help in developing algorithms suited to fundamental physics problems that use HPC resources

efficiently. Since open-source community codes will be used, the enhancements will become generally available to the user community.

The broader computational sciences community will benefit greatly from the distribution of accelerated modules of OpenFOAM, which may lead to improvements in other computational fluid dynamics-related projects.

"Modernizing the underlying codes used in scientific and industrial research is critical to advancing the pace of discovery and innovation," said Bob Burroughs, Director of Technical Computing Ecosystem Enabling, Intel. "We're thrilled to have LSU join us in this effort. The work they'll accomplish on modernizing OpenFOAM codes for Intel architecture will have a broad and lasting impact on the community for years to come."

Along with Liu, principal investigators on the project include James A. Lupo, Assistant Director for Computational Enablement, CCT; Mayank Tyagi, joint associate professor of petroleum engineering and CCT faculty member; **Krishnaswamy Nandakumar,** Gordon A. & Mary Cain Endowed Chair Professor, Cain Department of Chemical Engineering; and Karsten Thompson, Chair, Craft & Hawkins Department of Petroleum Engineering.

"OpenFOAM development on the latest accelerator technology from Intel is of great value to scientists and engineers. CCT and LSU greatly value this partnership with Intel," said J. "Ram" Ramanujam, Director, CCT.

About the LSU Center for Computation & Technology
*The LSU Center for Computation & Technology is an interdisciplinary research center at LSU. By uniting experts from diverse fields, ideas are disseminated to foster invention. The center concentrates on the use of advanced computing infrastructure to conduct research in many different fields which touch disciplines related to science, mathematics, engineering, business, digital media, mass communication, art, music, humanities and more.More information is available **here**.*

About Intel Parallel Computing Centers
*Intel Parallel Computing Centers are universities, institutions and labs that are leaders in their field. The centers focus on modernizing applications to increase parallelism and scalability through optimizations that leverage cores, caches, threads, and vector capabilities of microprocessors and coprocessors. Code modernization is expected to enable large performance increases while maintaining the code portability users expect. Training engineers on modernizing their code is also necessary. To meet this need, the centers are developing a curriculum to equip students, scientists, partners, and computer scientists with the skills to fully realize the capabilities of equipment parallel computing resources. By enabling the advancement of parallelism, the Intel ®Parallel Computing Centers will accelerate discovery in the fields of energy, finance, manufacturing, life sciences, weather, and beyond. More information is available **here**.*

Jose Romagnoli to take part in a National Science Foundation (NSF) funded Consortium, Smart MATerial Design, Analysis, and Processing (SMATDAP).

The Louisiana - Mississippi Consortium will develop new experimental and computational tools for accelerating development of smart polymers that have applications in medicine and material science. The interdisciplinary research team will apply molecular modeling and cyber control strategies across the lifecycle of polymer development from bench-top synthesis to product manufacture. The consortium will tailor the design of smart polymers to meet pressing needs in drug delivery, environmental remediation, and nanomaterials. Advances in the science of polymer characterization and materials synthesis will serve as a central theme for education and outreach activities that engage local schools, teachers, undergraduate and graduate students, and industry. By coordinating research with education and outreach, the consortium will work towards strengthening regional economic competitiveness through building a diverse science, technology, engineering, and mathematics (STEM) workforce.

Romagnoli holds the prestigious Gordon A. & Mary Cain Chair Professorship in the Cain Department of Chemical Engineering, as well as the M. Gautreux/Ethyl Chair Professorship of Process Systems Engineering. He has been a member of the LSU community since 2005, where he has received numerous awards, including the Donald W. Clayton Mentor Award in 2013 and 2008. His major areas of research interest include all aspects of Process Systems Engineering, with a special focus on: advanced multi-scale modelling architectures for complex processes; advanced multi-resolution image analysis and characterization techniques; design and synthesis with economic-environmental-operability considerations, intelligent data processing, reconciliation, and monitoring; advanced process control, and enterprise-wide optimization.

*More information is available **here**.*


K.T. Valsaraj and **Francisco Hung** conduct research for BP.

Valsaraj and Hung evaluated bursting bubbles as a pathway for hydrocarbons to move from the sea into the air and investigated the influence of Corexit 9500A on this process. They found that bursting bubbles transport alkanes (water insoluble oil compounds) to the atmosphere, independently from evaporation, and that the presence of dispersant increases the oil ejection rate. The researchers published their work in the November 2013 issue of The Royal Society of Chemistry's Environmental Science: Processes & Impacts, entitled "Bubble bursting as an aerosol generation mechanism during an oil spill in the deep-sea environment: laboratory experimental demonstration of the transport pathway."

The oil and gas released from the Deepwater Horizon oil spill that reached the sea surface had two means of transport, marine and atmospheric. Most discussion of oil, dispersant, and associated toxins entering the atmosphere centers on evaporation, and previous studies estimate that approximately 5% of the spilled oil evaporated. However, the aerosolization of oil and oil-dispersant mixtures through whitecaps, sea spray, and mist has been "largely ignored" and may need to be considered in accounting for oil fate. While marine chemistry literature widely discusses the spray generation mechanism and its being a primary means for particles to enter the atmosphere, "the ejection of solely crude oil by bubble sprays and the effect of added dispersants have not been investigated extensively." This study provides information that improves understanding of this process for an oil spill.

Researchers conducted a series of experiments on the ejection of oil alkanes from samples of weathered oil mousse, non-weathered crude oil (surrogate), and crude oil treated with Corexit 9500A. They simulated whitecaps to create bubbles as they might naturally occur at the air-sea interface with an aerosolization bubble column reactor. To evaluate alkane ejection, they used chromatography-mass spectroscopy; and to identify carbon fractions, they used a scanning electron microscope interfaced with energy dispersive X-ray images.

Results showed that the presence of Corexit 9500A increased the ejection rate of all alkane classes as compared to the ejection rate with just crude oil, but "especially for the C20-C29 [less volatile] alkanes." The more volatile alkanes increased by 47.7% (C10-C14) and 24.4% (C15-C19). The less volatile alkanes increased considerably more: 168.2% (C20-C24) and 126.1% (C25-C29). The team concluded that oil compounds with high volatility will predominantly evaporate, but "larger compounds will be ejected via film droplets resulting from bursting bubbles" and that breaking waves and whitecaps can "positively facilitate the dispersion of the oil. "Researchers explained that dispersants increased the oil ejection rate because they are designed to mix with only the oil droplets, making them smaller, scattering them in the water column, and reducing their coming back together. These smaller droplets become encased in bubbles as they rise to the surface because "air bubbles in the aqueous phase generally have higher capture efficiencies for finely dispersed surface active particles and droplets," supporting their conclusion that "the bubbles and droplets produced at the surface will be capable of transporting a larger fraction of the oil via aerosolization."

In their discussions, the researchers note that this aerosolization process "might be of particular importance for the fate of semi-volatile organic compounds as dissolution, microbial degradation, and evaporation are negligible for these compounds." Their findings have implications for the off- and onshore environment because "these smaller particles are…subject to potential long-range transport." The team acknowledged that this is "still a little understood process" and that the "transport of oil spill matter into the atmosphere is a complex process, where multiple transport vectors will take place and have to be considered." Kalliat Valsaraj, one of the study's authors, spoke about the complexities of this process: "The actual particle generation by breaking waves depends on many factors. For example, field measurements under different wind conditions (the main parameter) can vary up to two orders of magnitude. This study contributes to the fundamental possibility of the particle-based transport as a proof-of-concept." The authors recommend further study to find out if this process poses a threat to the environment at large.

The study's authors are Franz S. Ehrenhauser, Paria Avij, Xin Shu, Victoria Dugas, Isaiah Woodson, Thilanga Liyana-Arachchi, Zenghui Zhang, Francisco R. Hung, and Kalliat T. Valsaraj (Environ. Sci.: Processes Impacts, 2014, 16, 65-73).

This research was made possible in part by a grant from BP/The Gulf of Mexico Research Initiative (GoMRI) to the Consortium for the Molecular Engineering of Dispersant Systems (C-MEDS). The GoMRI is a 10 year independent research program established to study the effect, and the potential associated impact, of hydrocarbon releases on the environment and public health, as well as to develop improved spill mitigation, oil detection, characterization, and remediation technologies. An independent and academic 20 member Research Board makes the funding and research direction decisions to ensure the intellectual quality, effectiveness, and academic independence of the GoMRI research. All research data, findings, and publications will be made publicly available. The program was established through a $500 million financial commitment from BP. More information is available ***here****.*

Breaking New Ground

LSU College of Engineering Exceeds $100 Million Public-Private Partnership Goal

$55 million raised for the Breaking New Ground capital campaign

On February 3, three months ahead of schedule, the College of Engineering announced the success of a record breaking capital campaign. Publicly launched in April 2013, more than 450 individual and corporate donors pledged $55 million in private funds, fulfilling the College's commitment to a $100 million public-private partnership to renovate Patrick F. Taylor Hall and construct a new chemical engineering addition.

On October 2, 2012, Governor Bobby Jindal punctuated the role of LSU's College of Engineering in Louisiana's economic development initiatives by announcing the support of $50 million in capital outlay funding for the $100 million project—provided that donors gave $50 million of the support.

"We are grateful for the hundreds of donors who stepped up to the plate to make this partnership a reality," said Jindal. "Experts say they have never seen an industrial expansion like the one currently under way in our state, but they also say we are going to need to train and attract even more people to fill the demand for all the jobs coming to Louisiana. That's why we are laser focused on making sure we have the tools to prepare our students so they can fill the jobs in the pipeline. This partnership will help accomplish that goal."

The $100 million renovation and expansion will support Louisiana's engineering workforce and innovation needs. Upon completion, the College expects to almost double the number of graduates, from 650 to 1,000 engineers, computer scientists, and construction managers annually.

"The engineering expansion is an investment in our students and their careers," said President and Chancellor F. King Alexander. "It will also attract the top faculty who will work with students to solve some of our state's greatest problems. The speedy success of the campaign demonstrates the confidence of our alumni and industry in LSU Engineering."

Alumni, industry partners, and other donors committed $55 million to the project, an unprecendented show of support that made Breaking New Ground LSU's most successful short-term fundraising effort.

"This is one of the great moments in the history of LSU's College of Engineering. A moment defined by the generosity and support of a remarkable group of donors along with the commitment from Governor Jindal and the state. The momentum of their investment will position the college to take a leading part in securing Louisiana's position as a national leader in research and education."

-Rick Koubek, Dean, College of Engineering

Madison Longwell, a first-year biological engineering student, said of Breaking New Ground, "Improved teaching and research spaces, an enhanced senior design capstone space, and engineering projects on display will inspire and reinforce a sense of pride and motivation for students. LSU is breaking new ground! With improved recruiting, facilities, and student preparedness, the LSU College of Engineering will have a positive impact on the State of Louisiana and the nation as a whole."

Colman and Partners, Perkins + Will was selected as the architectural firm to transform LSU's engineering campus. Construction is slated to begin this spring, with an estimated completion scheduled for fall 2017. Updated labs, combined with the quality education already offered at LSU, will provide students a more practical, hands-on experience to better prepare them to enter the global marketplace.

Breaking New Ground

BASF Pledges $1 Million to LSU College of Engineering Expansion

Donation to create LSU's first sustainable living laboratory

LSU's College of Engineering announced a $1 million donation from BASF Corporation to establish a sustainable living laboratory, the first of its kind at LSU and in the Southeast region. The lab will promote problem-based teaching and research to develop solutions focused on sustainable development. The project is part of the renovation of Patrick F. Taylor Hall and engineering expansion for the College of Engineering.

"BASF's contribution to LSU's College of Engineering further reinforces our commitment to the Louisiana community and our employees, and to putting sustainability into practice," said Beate Ehle, President of Market and Business Development, North America for BASF Corporation. "In support of BASF's corporate strategy, 'We Create Chemistry for a sustainable future,' the sustainable living laboratory will help to find new ways to conserve resources and improve our quality of life."

BASF has been part of the economic growth in Louisiana by announcing more than $350 million in investment projects at their Geismar site since 2009.

"The development and investment in the Louisiana workforce is critical to BASF's long-term success," said Tom Yura, Senior Vice President and Manager of the BASF site in Geismar, Louisiana. "In addition to BASF's sustainability efforts, this project is part of our local activities to invest in students and help them be prepared for career opportunities in engineering and science while making a difference in the world today."

The lab will operate under a lab-lease concept. Researchers may submit proposals for consideration, which will be evaluated on innovation, relevance and benefits, and community impact. Additionally, the lab will serve as a teaching tool for students and the community to better understand research and implications of environmental stewardship.

"BASF Corporation's generous donation strengthens our strategic partnership in sustainable living initiatives," said LSU President and Chancellor F. King Alexander. "This unique gift positions LSU to be a leader in the US and globally."

BASF's contribution will receive the one-to-one state match provided by the State of Louisiana under the agreement between the state and LSU to expand its engineering facilities.

"By investing in the sustainable living lab, BASF is pioneering innovative approaches to enlighten our community on sustainability issues and how to best nourish a growing culture of environmental stewardship," said Rick Koubek, Dean, College of Engineering. "It is our desire that this laboratory will serve as a catalyst in furthering the sustainability initiatives on LSU's campus and highlighting the importance of fostering creative problem solving in our communities."

*BASF Corporation , headquartered in Florham Park, New Jersey, is the North American affiliate of BASF SE, Ludwigshafen, Germany. BASF has more than 16,600 employees in North America, and had sales of $18.5 billion in 2012.More information about BASF's North American operations is available **here**.*

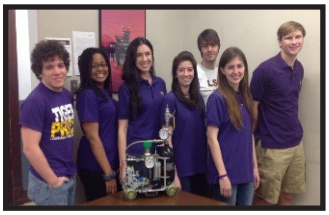
The New Patrick F. Taylor Hall & Chemical Engineering Building

436,691	Net Assignable Sq. Ft. upon Completion of Renovation & Expansion Project
41,202	Sq. Ft. Student Collaboration
134,969	Sq. Ft. Teaching & Lab Space
1,576	Classroom Seats
272	Faculty & Staff Offices
1	Largest Academic Building in LA

Philanthropy

537	Donors to the Breaking New Ground Campaign
20	$1 Million+ Gifts to the Campaign

AIChE
American Institute of Chemical Engineers



ChemE Car Team (Left to right: Thomas Wade, Carrie Garrison, Aubyn Chavez, Staci Duhon, Trey Frederick, Kelly O'Quinn, Daniel Hulgan)

LSU Engineering Students Build Car Powered by Chemical Reactions

On March 22, after months of preparation, four LSU chemical engineering students traveled to San Juan, Puerto Rico, to compete at the American Institute of Chemical Engineers (AIChE) regional conference's car competition.

The goal of the LSU AIChE car team is to create a motorized vehicle powered by chemical reactions. The team must calculate the reactions to manipulate the exact distance the car must reach. The team will not know the distance the car is supposed to run until they arrive for the competition, and then they will face further challenges since they are not allowed to test the car on any trial runs once in Puerto Rico.

"It's about precision. It's nothing about speed," said Aubyn Chavez, chemical engineering senior and LSU AIChE car team captain. "You can't do any trials; you'll get disqualified. Based on your data, you should be able to compute how much of the reactants you need to be able to go as close to that distance as possible."

"Whoever comes closest to the mark, over or under, wins the competition and advances to nationals," said Kelly O'Quinn, chemical engineering junior.

The LSU AIChE team decided to create two chemical reactions for the car: a hydrogen peroxide decomposition reaction to start the car, and an iodine clock reaction as a stopping mechanism.

Chavez said working out the stopping mechanism was the most difficult task for the team, but once they figured it out, she was ecstatic.

"When I tried the iodine clock reaction and it turned the color it was supposed to, I jumped on the person with me," said Chavez. "When you accomplish things, you get excited with your team."

Chavez gives credit to her team and to the LSU College of Engineering faculty for pushing the team to succeed.

"I had so many people willing to help me out. Everyone is amazing," she said.

Staci Duhon, chemical engineering junior, commented that the stress of the project motivated her, and the support of her LSU engineering family gave her encouragement.

"Through this project I've learned a great deal about how I work under pressure and I've really come to crave the stress of it," Duhon said. "It means so much to me to be a part of a group of supportive classmates, professors, and industry professionals."

Duhon stated the best part of car team is putting all the facts and figures she's learned in class to work on producing the car.

"A lot of my day consists of sitting in a chair and reading, working problems, or listening to a lecture," Duhon said. "I get so excited to spend any part of my day physically doing the work that I've spent semesters learning in a chair."

Because AIChE's regional conference was located in Puerto Rico this year, the LSU AIChE team could not afford to send all its members. Only Chavez, Duhon, O'Quinn, and Daniel Hulgan attended.

"It is a very rewarding opportunity to be able to compete and represent LSU with our car," said O'Quinn.

"None of this stuff counts toward classes. If you want to get involved, it's because you like doing it," said Chavez. "It's really about developing a passion. Even though you're not getting rewarded for it per se with a good grade, it really does excite you for your major."

Four LSU AIChE students competed in the annual ChE Jeopardy competition where they answered questions related to chemical engineering fundamentals and applications with topics including fluids, thermodynamics, material and energy balances, and unit operations. The team won the preliminary round by defeating teams from the University of Kentucky, Worcester Polytechnic Institute, and Trine University. In the final round they placed second behind the University of Iowa, with third place going to the University of California at Berkeley.

Top: Adam Melvin (advisor), Daniel Hulgan, Kevin Whittaker*, David Englehardt, Mark Bandy*, Thomas Turner; Bottom: Aubyn Chavez, Seleipiri Charles, Kelly O'Quinn*, Anais Lowe, Mindy Duong, Amiel Kirtikar, Lindsey Blouin; *denotes Jeopardy Team members*

Student Awards & News

Junior/Senior Poster Presentations – May 2014

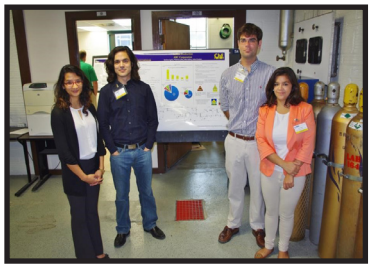
The Department would like to thank the 30 industry professionals—and the companies they represent—who gave their time, energy, and thoughtfulness in judging this year's Junior/Senior Poster Presentations. Without their efforts, the event would not have been such a success. Participating students enjoyed 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.

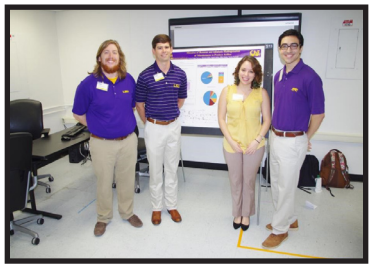
This year, the juniors were tasked with finding a way to use methane or hydrogen as an alternate fuel source to gasoline for use as vehicle fuels. The core problem was to "determine the optimal number of compressors needed to compress either hydrogen or methane to the pressures appropriate for a fuel tank." They were also instructed to discuss all the relevant safety aspects of the project. Congratulations are in order, for the judges scored the 19 groups of students extremely well overall.

Seniors were "assigned the design of a plant to produce aniline by nitration of benzene followed by hydrogenation of nitrobenzene. The aniline is to be used internally by a polyurethanes plant and the students must determine the total cost of production per pound of aniline. Each of 20 teams were assigned a production rate ranging from 50,000 to 240,000 metric tons per year." 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 extremely impressed with the seniors, scoring their posters with high marks and superb comments. However, there were two groups that stood out and earned the Best Design Award for 2014.

Congratulations to both teams for their outstanding work and dedication!



Team 1
Lakhe, Aguilar, Trusheim, Salinas



Team 2
Kubiak, Hooter, Bokivar-Baez, Rockwell

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.

2014 Graduate Recruitment Weekend

February 20-22, 2014

On Thursday, February 20, ten prospective graduate students arrived in Baton Rouge to take part in our 2014 Graduate Recruitment Weekend. 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. The next morning they traveled to Alex Box Stadium, where they ate at the Champion Club and were given a tour of the stadium. Aaron then led them on a tour of our CAMD facilities. Following the morning activities, they participated in a round robin of faculty poster presentations and lab tours. That evening they were treated to a Louisiana specialty, a good old-fashioned crawfish boil. After eating and getting to know the faculty and current graduate students, they were brought back to Alex Box Stadium, where they watched LSU shutout Virginia Tech 9-0. Saturday, they parted our company and returned to the airport, excited about their visit to our beautiful campus. To all who participated: THANK YOU!

Student Awards & News

Annelise Annestrand was awarded the **University Medal** at LSU's spring 2014 commencement, as well as the College of Engineering's **Edward McLaughlin Dean's Medal of Excellence** for graduating with a perfect 4.0 GPA in all her undergraduate course work.

"All of the chemical engineering faculty have had a great impact on my time here and everything that I have learned," said Annestrand when asked who has made a difference in her life at LSU.

Annestrand also received LSU University College's **Phi Eta Sigma Senior Award**.

LSU University College hosted its annual Phi Eta Sigma Initiation Ceremony on April 22 in the LSU Student Union's Royal Cotillion Ballroom. University College's Chapter of Phi Eta Sigma inducted 115 first-year scholastic achievers. They also presented the L. B. Lucky Award and Senior Award.

"Phi Eta Sigma is pleased to recognize our outstanding sophomore and graduating senior members for their academic achievement," said R. Paul Ivey, Executive Director of LSU University College. "These annual awards are an important part of our Spring Induction Ceremonies and hopefully provide our newest members with inspiration to continue their academic excellence."

Annestrand received LSU University College's Phi Eta Sigma Senior Award and earned a Bachelor of Science in Chemical Engineering, maintaining a 4.0 GPA. Annestrand is a member of Delta Zeta Sorority, the Tau Beta Pi Engineering Honor Society, American Institute of Chemical Engineers, Society of Women Engineers, the Order of Omega Greek Leadership Honor Society, and the Rho Lambda PanHellenic Leadership Honor Society.

"It has been an honor to receive LSU scholarships and awards, all of which have allowed me to pay for school," said Annestrand. Throughout her tenure at LSU, Annestrand was awarded the Chevron Texaco Chemical Engineering Scholarship, LSU Alumni Association Top 100 Scholarship, ExxonMobil Teagle Scholarship, LSU Pegues Scholarship, and the Houston Alumni Endowment Scholarship.

In addition to her academic achievements, Annestrand has participated in Habitat for Humanity and volunteered at various schools for children with speech and hearing disorders, including St. Lillian's Academy and Baton Rouge Speech and Hearing.

After graduation, Annestrand began employment with ExxonMobil in the Baton Rouge Refinery. She interned with ExxonMobil in the summer of 2013 and had a great experience.

"I am very excited for this new opportunity," said Annestrand regarding her employment offer.

The Dean's Medal of Excellence award commemorates McLaughlin's 28 year LSU career as professor, researcher, department chair, and dean.

Established in 1992, the Senior Award recognizes a Phi Eta Sigma member who is a graduating senior and has maintained the best cumulative grade point average and overall academic record at LSU.

Phi Eta Sigma is a national honor society rewarding first-collegiate-year scholarship. Since 1928, the LSU Chapter of Phi Eta Sigma has inducted more than 10,500 students. The goal of the society is to encourage and reward academic excellence among full-time, first-year students in institutions of higher learning, who have a minimum 3.5 cumulative grade point average. Inductees receive national recognition, membership, and undergraduate and graduate scholarship opportunities of over $300,000. The oldest and largest first-year honor society, Phi Eta Sigma was founded at the University of Illinois on March 22, 1923. Since its founding, more than a million scholars have been inducted into Phi Eta Sigma, and more than 370 collegiate chapters have been established throughout the US.

Heather Pickering was announced as the recipient of the **Warren N. Waggenspack Jr. Leadership Legacy Award** in May 2014.

Pickering started as a peer mentor for a group of first-year students in the Encounter Engineering Bridge Camp. She excelled as a mentor and soon became a camp leader, overseeing five-six peer mentors and their respective protégés. Additionally, she mentored students in ENGR 1050 and became a leader in LSU's AIChE student chapter.

In March 2013, Pickering and another mentor provided a workshop at the National Science Foundation's Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) meeting for a national audience on the peer mentoring program. Because

the workshop was so successful, Pickering and her co-presenter were selected to provide a webinar, which she hosted in November 2013. The student who nominated her, Jacob Cook, stated:

"Heather Pickering is not just a great student or mentor. She is a magnificent person and friend. She possesses the ethical behaviors of a seasoned professional, the compassion of someone who wants the best for herself and whatever she invests her time in, and the willingness to go above and beyond the call for the greater good."

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 one or more 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.

Virginia Bolivar-Baez was recognized with the **2014 Student Award from The American Institute of Chemists.**

Her professors selected her on behalf of LSU for demonstrating leadership ability, character, scholastic achievement, and advancement potential in the chemical professions. After graduating in spring 2014, Bolivar-Baez began employment with Marathon Petroleum in Garyville, LA.

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.

Aaron Harrington received the **Clayton Engineering Excellence Award for Outstanding Graduate Students.**

Harrington is earning his doctoral degree in chemical engineering, as well as a minor in petroleum engineering. His research is centered on simulations for in-situ upgrading and conversion processes of shale oil formations and mechanisms of heat reflux and condensation in the formation wellbore. Harrington earned his bachelor's degree in chemical engineering from the University of Florida. He currently serves as President of the Chemical Engineering Graduate Student Association and wants to live a life revolved around study and discovery.

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 Engineering Hall of Distinction in 1993. He and Gloria Pichon Clayton founded the awards in 2004 with a generous donation.

2013-14 BASF Team Chemistry Awards

BASF has awarded a total of $25,000 in scholarships to ten outstanding LSU engineering students—six of which are in chemical engineering—as part of the BASF Team Chemistry Scholarship Fund.

BASF employees mentor and support students through various programs and organizations on campus. The company also recognizes an LSU Professor of Excellence each semester.

"BASF is a key corporate partner for the College of Engineering and provides the resources necessary to help our graduates transition to successful careers," said Rick Koubek, Dean, College of Engineering. "Through BASF's support of the Team Chemistry Scholarship Fund, these College of Engineering students will receive assistance to succeed both in the classroom and the workplace."

FALL 2013 AWARDS

William Fruge, a junior majoring in chemical engineering, has made the Chancellor's Honor Roll since fall 2011 and completed two years of engineering coursework at South Louisiana Community College. A graduate of Notre Dame High School in Crowley, Louisiana, Fruge received the school's top graduate honor, the Victoria Reggie Award, as well as the Knights of Columbus Catholic Leadership Award. He is a member of the American Institute of Chemical Engineers. He plans to graduate in May 2015.

Student Awards & News

Breanna Lee, a sophomore majoring in chemical engineering and minoring in business administration, is a Baton Rouge Magnet High graduate. She is a Louisiana Science, Technology, Engineering, and Mathematics (LA-STEM) Research Scholar, a Society of Women Engineers Scholar, a Rubicon Academic Excellence Scholar, a Louisiana Legislative Women's Caucus Foundation Educational Advancement Opportunity Scholar, and a recipient of the Tiger Excellence Scholars Award. She serves as webmaster for the Society of Women Engineers and is a youth development professional for Boys and Girls Club of America and AmeriCorps. She plans to graduate in May 2017.

Andrew Pham, a junior majoring in chemical engineering, is a research assistant in the Cain Department of Chemical Engineering. He is president of the Student Learning Organization and a member of LSU Diversity Ambassadors and the American Institute of Chemical Engineers. He is a LA-STEM Research Scholar and a recipient of the LSU Academic Scholars Award and Taylor Opportunity Program for Students (TOPS) Honors Award. He was salutatorian of John Ehret High School in Harvey, Louisiana.

SPRING 2014 AWARDS

Vanessa Beall, a sophomore majoring in chemical engineering, is a resident of Prairieville, Louisiana. She mentors young pregnant and parenting teen mothers, like herself, to ensure they are on the right path to success. Despite the challenges of being a teen mother, she maintains a 3.8 GPA while working part-time. She plans to graduate in 2017.

"Graduates in engineering and science are essential to the success of BASF and many other industries in our region. Our Team Chemistry Scholarship Fund is not only an investment in our communities where we provide rewarding careers for Louisiana's top academic achievers, but also an investment in the next generation of BASF leaders."

-Tom Yura, Senior Vice President & Manager of the BASF site in Geismar, Louisiana

Natalie Burges, a sophomore majoring in chemical engineering with an environmental concentration, is from Katy, Texas. She is enrolled in the LSU Honors College and serves as an LSU Ambassador. She is a member of the Society of Women Engineers, LSU Engineers without Borders, and the Society of Hispanic Professional Engineers. Her academic recognitions include the National Society of Collegiate Scholars, Richard L. O'Shields Engineering Endowed Scholarship, William L. Jenkins Honors Scholarship, and the Academic Scholars Nonresident Award Scholarship. She plans to graduate in 2017.

Robert Quiring, a sophomore majoring in chemical engineering and minoring in business administration, is a resident of Lafayette, Louisiana. He has made the Chancellor's Honor Roll and the Dean's Honor Roll multiple semesters. He works part-time for the LSU Flores MBA program while serving in a leadership role for his fraternity Beta Upsilon Chi. He plans to graduate in May 2016.

ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

ASEE annually publishes the leading data on engineering colleges in the United States including both individual college statistics and national trends.

In 2013, LSU's College of Engineering progressed to the top five percent nationally in enrollment and top ten percent nationally in degrees conferred. The CoE was ranked 18th nationally in the number of undergraduate students enrolled out of 355 schools reporting and 36th nationally in the number of undergraduate degrees granted out of 357 schools reporting.

LSU's chemical engineering program ranked number 38 out of 161 schools reporting for bachelor degrees conferred.

LSU CAREER SERVICES

Based on salary data engineering graduates provided to LSU Career Services in 2014, four of the CoE's disciplines exceeded the national averages.

The CoE's four undergraduate degrees that exceeded the national average were*:

Discipline	LSU Average	National Average
Chemical Engineering	$77,557	$67,300
Electrical Engineering	$71,616	$63,700
Mechanical Engineering	$70,716	$63,700
Computer Engineering	$69,594	$68,900

*Industrial Engineering is the only discipline taught in the CoE that is not included in the survey

"The starting salaries of those with an LSU engineering degree have consistently exceeded the national average, once again reflecting the industry's perceived value of the LSU degree," said Rick Koubek, Dean, College of Engineering.

Student Awards & News

2013-14 Undergraduate Scholarship Recipients

Alan M. Raymond Scholarship
Ragan Gauthier

Boykin & Mable Pegues Scholarship
Jeremy Alcanzare, Mary Balhoff, Virginia Bolivar-Baez, Chelsea Bourdon, Katherine Bruner, Abigain Burcham, Victoria Dugas, Jonathan Gardner, Jacob Giffin, Aleshia Hector, Marshall Heltz, Luke Holloway, Daniel Hulgan, Kyra Jones, Caroline Limbaugh, William Nickel, Connor Reaux, Kurt Ristroph, Thomas Rockwell, Ellis Sartain, Michael Skapura, Edward A. Thistlewaite

BP Scholarship
Isaiah Woodson

Chevron Texaco Scholarship
Annelise M. Annestrand, Renee L. Fogarty, John K. Rollins

Citgo Petroleum Scholarship
William W. Fruge, Courtney M. Rome

Clara & Frank R. Groves Sr. Undergraduate Scholarship
Katherine A. Frederickson

CoE Alumni Scholarship
Rebecca Andries, Lindsay Clouin, Courtney Cribbs, John Fleming, Kevin Kirchner, Garett Lambert, Peter Ottsen, Chelsie Spadoni, Rebecca Taylor, Kavin Watanachariya

Eugene R. Cox Scholarship
Brandon M. Boyett

ExxonMobil Scholarship
Virginia Bolivar-Baez, Aleshia Hector, Amiel Kirtikar, Jeremy Wade, Cameron Williams

Floyd S. Edmiston Jr. Scholarship
Kurt D. Ristroph, Chaning E. Simmons

Gene Purdue Lowe Scholarship
Jade E. Bates, Dalton J. Choiniere, Daniel J. Hulgan, Lauren A. MacKenzie, Blair E. Rispone, Matthew W. Skapura, Shu Xin

Gerard Family Undergraduate Scholarship
Peter K. Ottsen, Dylan J. Parker

Houston Area Alumni Scholarship
Annelise M. Annestrand

Jesse Coates Scholarship
Drake Tassin

Leo Broering Memorial Scholarship
Lexie L. Breaux

Lyondell Basell Futures in the Chemisphere Scholarship
Lexie L. Breaux, Cara Leger

Marathon Petroleum Scholarship
Justin P. Katz

NACME Scholarship
Kareem Awad, Aleshia Hector, Breanna Marie Lee, Marc Rios, Bethany Sarabia

O. Dewitt Duncan Jr. Scholarship
Pilar I. Albert, Taylor P. Cavalier, Luke E. Holloway, Michael F. Kelley Jr., Brandon X. Lorentz, Thomas W. O'Brien, Frederick A. Smith, Kelly L. Yates

Pathway Scholarship
Julie Clark

Paul M. Horton Memorial Scholarship
Zachary E. Sirera, Tate R. Stumper

R.L. Hartman Scholarship
Sami G. Marchand

Ram N. Bhatia Scholarship
Sneha N. Seetharama

Routh Family Scholarship
Connor Reaux

Taylor Scholarship
John Villarrubia

Thomas H. Hopkins Scholarship
Amiel Kirtikar

Walter G. Middleton Jr. Scholarship
Allen W. Huang, Alexander J. Nadler

2013-14 Graduate Scholarship & Award Recipients

William A. Brookshire Distinguished Fellowship
Aubrey Heath

AIChE 2013 Best Dissertation Award
Gregory Robertson

Fulbright Fellowship
Jorge Chebeir, Onur Dogu

Gordon A. & Mary Cain Graduate Assistantship
Eva Caspary, V. "Venky" Kalpathy

Graduate School Scholars Program
Aubrey Heath

Flagship Graduate Assistantship
Aaron Harrington, Gregory Robertson, Christopher Stevens, Tommy Trieu

Coates Travel Award
W. "Barrett" Ainsworth, Xiaoxia He, Aubrey Heath, Courtney Lane, Zenghui Zhang

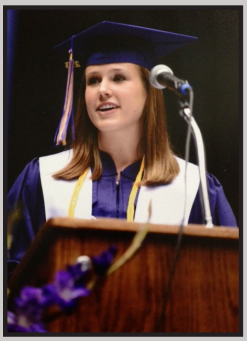
Departmental Awards

Courtney M. Rome was the 2014 recipient of the Department's **Jesse Coates Award**. 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.

Annelise M. Annestrand received the **2014 Chemical Engineering Junior Award** for holding the highest GPA at the end of the semester in which 90 hours are completed.

The following students received the **2014 Senior Award** for finishing in four years with no drops:
Annelise Annestrand, Katherine Bruner, Jacob Giffin, Marshall Heltz, Kara Jones, Corey LeBlanc, Mariah Massey, Sydney May, Brian Mickey, Dylan Parker, Courtney Rome, Frederick Smith, Victoria Willis

Commencement



Mary Lauren Wheelahan gave the closing remarks at **LSU's Fall Commencement, December 20, 2013.** What follows is the final draft of her speech:

Like any good commencement address from any university anywhere in the world, it has to start with a thank you to the parents and family. Thank you for trusting us with your financial support that has given us the privilege of a higher education. Thank you for providing us with your emotional support that has gotten us through many stressful weeks throughout college. And most of all, thank you for guiding us with your wisdom. Because believe it or not, we did listen to you all of those years and actually followed your advice; otherwise we wouldn't be here today adorned in these caps and gowns.

I feel honored to have been asked to offer a few final thoughts today on behalf of our graduating class. And I thank you for this opportunity.

I cannot stand up here today and pretend like I know anything about this place they call the real world. As your peer, I am just as nervous and naïve about the challenges that lie ahead of us outside these walls of LSU. What I do know is what our wise professors have taught us: the first step to encounter and tackle any challenges we may face is to figure out the basics.

So today, I would like to offer two basic points before we step into the next chapter of our lives.

Point number 1: Understand our role in the world of engineering. Ladies, we are in a unique position. If we were to look back 50 years at this audience, very few women would be walking across the stage. But look how far we've come and how far we can go. However, credit must be given where credit is due. To the guys in the audience, we've had the privilege and honor of working next to you, and we've learned from you, and hopefully you've learned a little bit from us. Together all of us have learned how to lead and follow, how to dissect and work through difficult problems, and most of all, in the end, how to make any process work by working together. One of the best tools we have received from our experience here is the ability to put our diversities aside. Whether it's gender, nationality, or simply just different ways of thinking, we had the chance to understand, to accept, and to respect all aspects of people. This tool will get us far in the working world. And this brings me to point number 2.

Point number 2: Remember we're smart. Not just GPA smart, but smart in that we know how to work hard and we know to think critically. But we need to be more than just smart. We need to make the choice to be good people. Our lives will consist of being process engineers, construction managers, software designers, and grad school students. How we perform in our careers does matter, but what matters just as much, and arguably more, is how we treat those around us who we interact with. Kindness, patience, honesty, ethics; all of these need to be intricately woven into each aspect of our lives—not just during our 40 hour work week. We have been raised with these values and today I want to stress the importance of these values as we leave college.

So before we step out of the PMAC and walk past Mike's cage, we need to pause and reflect on the importance, the immense significance, of this moment. We are graduating from Louisiana State University's College of Engineering. We have been equipped to make changes, to shake things up, to improve our world. We are ready to make contributions to our new careers and to become involved in meaningful activities outside of our work. And amidst all of this greatness, we have the immeasurable opportunity to be more than good engineers; we need to also be good people.

Commencement

Summer 2013 Commencement

Doctor of Philosophy in Chemical Engineering
Mohammed Shafi Syed

Master of Science in Chemical Engineering
Oladapo Ayeni
Christian Clause
Pratibha Sharma

Bachelor of Science in Chemical Engineering
Mark Burton

Fall 2013 Commencement

Master of Science in Chemical Engineering
Aryan Geraili
Amie Kathryn Hansel
Chuanlin Zhao

Bachelor of Science in Chemical Engineering
Alexander Jordan Aydell
Toxie Joseph Bercegeay
Dalton Joseph Choiniere
Julie Moss Clark
Arthur Ray Collins II
Renee Leigh Fogarty
Katherine Anne Fredericks
Jordan Christopher Longstaff
Kaelee Anne Mader
Douglas Jonathan McClung Jr.
Stephen Wade Muller
William Taylor Nickel
Peter Kenneth Ottsen
Nikhil Dhansukhbhai Patel
Marc Edward Rios
Eleanor Jane Rome
Drew Aaron Scheinuk
Spencer Mark Simon
Harsha Sirigireddy
Tate Riley Stumper
Mary Lauren Wheelahan

Spring 2014 Commencement

Doctor of Philosophy in Chemical Engineering
Seyed Amin Mirsaeidi Farahani
Devendra Pakhare
Gregory McKinne Robertson
Thomas Foster Scherr

Master of Science in Chemical Engineering
Rubaiyet Abedin
Eileen Mara Cranfield
Onur Dogu
Catherine Alexis Grubb
Abhijit Rao
Christopher Clayton Stevens
Michael Carl Thomas

Bachelor of Science in Chemical Engineering
Annelise Marie Annestrand
Bao Thai Bach
Brett Thomas Baragona
Joseph Alexander Biondini
Virginia Margarita Bolivar-Baez
Jillian Rose Bosley
Benjamin Simon Brown
Katherine Elise Bruner
Brian Michael Catanzaro
Matthew Stephen Christy
Alicea Emilie Collins
Kaylyn Elizabeth Crews
Cody Wayne Daniels
Amanda Marta Dembski
Mark Joseph Ferry
Jacob Floyd Giffin
Maci Michelle Guercio
Heather Jordan Harrison
Marshall David Heltz
Terri Rosenell Johnson
Kyra Skye Jones
Nicholas Raymond Kubiak
Pritishma Lakhe
Corey Steven LeBlanc
Ta'Ryan Collieen Lloyd
Brett Anthony Loup
Teralyn Ann Louque
Mariah Lane Massey
Sydney Arianna May
Brian Douglas Mickey
Duyen Xuan Thi Nguyen
Jennifer Toyin Odeniran
Maria Jose Palacios Mejia
Dylan James Parker
Heather M. Pickering
Connor Joseph Reaux
Angel Francisca Roche
Courtney Marie Rome
Jason Robert Rosensteel
Fallon Polette Salinas Gonzalez
Emily Celeste Sharp
Spencer Mark Simon
Michael James Skapura
Frederick August Smith
Cody Ryan Spencer
Lauren Elizabeth Stout
Drake David Tassin
Jordan Elizabeth Terry
Joshua Clark Trusheim
Cem Ulus
Emily Shannon Walker
Margot Lange Waterman
Victoria Kelly Willis
Isaiah Jamal Woodson

Alumni News & Updates

The LSU Engineering Hall of Distinction proudly welcomes **Adrian Vaughn Mitchell.**

Mitchell earned a bachelor's degree in chemical engineering from LSU in 1996 and received an MBA from Harvard Business School in 2000.

Mitchell joined Crate & Barrel in 2010 and today serves as chief financial officer and chief operating officer, leading a team of international associates as head of the international retail and e-commerce operations, global supply chain operations, architecture and construction, real estate, facilities, tax, treasury, and controller/accounting and finance departments.

Prior to joining Crate & Barrel, Mitchell spent four years with Target Corporation in Minneapolis, Minnesota. He advanced from senior group manager to director of innovation and productivity during his first year with the organization and in 2009 was named Director of Strategy and Interactive Design, reporting directly to the president. During his career with Target, Mitchell was appointed to the Diversity Action Committee and was an executive member of multiple steering committees.

During eight years with the management consulting firm McKinsey & Company Inc., in Dallas and Chicago, Mitchell served as a business analyst, associate, engagement manager, and associate principal/junior partner. Early in his career, he was an associate in corporate finance with the investment banking division of Goldman Sachs & Company Inc., in New York City.

Mitchell excelled academically and as a student leader. At LSU, he was named the University and College of Engineering Most Outstanding Student three years in a row, US Black Engineering Student of the Year, National Society of Black Engineers Member of the Year, and invited to join the Board of Directors of the Minority Engineering Program. He received the Bert King Foundation Fellow for Student Leadership at Harvard Business School. Mitchell and his wife, Lily, a graduate of Southern University in Baton Rouge, have three children—Lydia, Abel, and Nathanael. They reside in Winnetka, Illinois.

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.

"I am eternally grateful to LSU for the opportunities it provided me and for the many mentors among faculty who supported me every step of the way. LSU, thank you!"

-Adrian Vaughn Mitchell, 2014 LSU Engineering Hall of Distinction Inductee

Dr. Edgar Hernandez has a bachelor's degree in chemical engineering from the University of Puerto Rico at Mayaguez, master's degree in chemical engineering and industrial engineering from LSU, and a doctoral degree in chemical engineering from LSU. He has been a registered professional engineer since 1977.

His professional experience includes: Environmental engineer in PPG from 1976-78, Professor of Chemical Engineering for the University of Puerto Rico at Mayaguez from 1981-86, Technical Operations Director of Merck Sharp & Dohme from 1986-90, and engineering and environmental consultant from 1990 to present. He has vast experience in federal and state environmental laws and regulations.

Hernandez was Delegate and President of the Institute of Chemical Engineers of the College of Engineers and Land Surveyors of Puerto Rico and President of the Special Activities Commission in charge of the Annual Convention. He is currently President of the Puerto Rico Chapter of the American Institute of Chemical Engineers. He was founder and first Director of the Chemical Engineering Department of the Polytechnic University of Puerto Rico.

Hernandez was elected to Who's Who Among Students in American Universities and Colleges in 1976 and to Who's Who in Engineering in 1995. In 1999, he was selected Distinguished Chemical Engineer of the Year by the College of Engineers and Land Surveyors of Puerto Rico. In 2008, he was elected member of the Pan American Engineering Academy in Brazil. He is also a member of the Puerto Rico Manufacturer Association (PRMA) Environmental Committee and the Puerto Rico Chamber of Commerce Energy and Environmental Committee.

Currently, he provides engineering and environmental consulting services for various companies in Puerto Rico. For some, he has provided services for more than 20 years.

Alumni News & Updates

On August 1, 1988, **Mr. Joakin Giralt Mestre** was appointed Manager of International Marketing for the Specialty/Performance Chemicals Business Center of Texaco Chemical Company. Prior to this, Mr. Mestre was Area Sales Manager for Texaco Chemical Company in the Additive Business Center group. In 1987, he spent several months evaluating additive representative activities in Southern Europe covering the Mediterranean area and living in Madrid, Spain.

Mr. Mestre holds a bachelor's degree in chemical engineering from LSU, known by his Kappa Alpha order fraternity brothers as "Keeno." He started his professional career with the Royal Dutch Shell Group in Cuba, spending one year in the UK. Upon leaving Cuba in 1962, he joined the Armour Chemical Company in Chicago, Illinois, handling US domestic sales to the petroleum industry. In mid-1966, he accepted an offer from Jefferson Chemical Company in Houston, Texas, to handle international marketing responsibilities.

Mr. Mestre and his wife, Pola, reside in Houston. They have one son, "J," a graduate from Rice University with an MD Certification and unlimited license from the University and State of Maryland. He is board-eligible in internal medicine and, at present, is working as an anesthesiologist in Tallahassee, Florida. They have two daughters—Polly, the eldest, graduated from Texas A & M with a master's degree in occupational therapy from Texas Women's University and Ana Marie, the youngest, who is also an Aggie graduate with a year of post-graduate studies at Miami University of Ohio in their European overseas campus in Luxemburg. Last but not least, are Emily Anne, Leslie Catherine, Julia Lynn, Theresa Claire and Christina Rose, his five granddaughters.

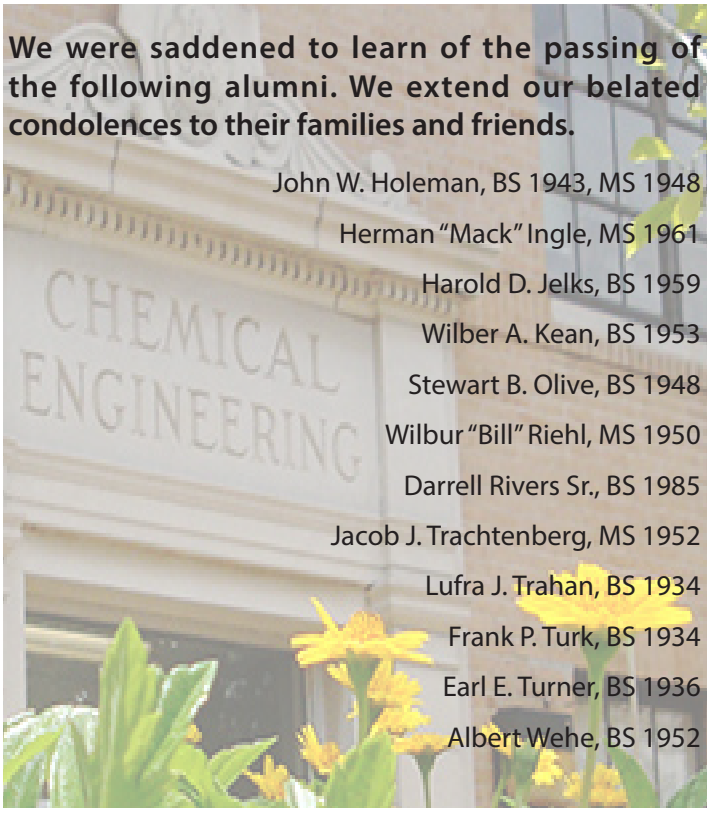
Mr. Mestre feels that through his family contribution to American Society, he has given back, somewhat, the confidence placed on him and his family in 1967 during their US citizenship procedures. He is very proud of both.

"Keeno" originally wrote this letter as a mini-resume on December 31, 1993. He immigrated to the United States from Cuba in 1961 with his wife, his three small children, a young nephew, and an elderly aunt. He is currently retired and living in Houston, Texas.

Dr. Charles D. Fournier (Charlie, BS 1966, MS 1968, PhD 1970) is currently Executive Vice President at John H. Carter Company, a distributor of control valves, distributed control systems, and instrumentation with operations in Louisiana, Mississippi, Alabama, Florida, and Arkansas. Charlie has been in his current position for the last 25 years. Prior to joining John H. Carter Company, he was Vice President of Engineering and Marketing at Baker Hughes Corporation, a General Manufacturing Superintendent at Monsanto's Luling, Louisiana plant, and an Associate Professor of Chemical Engineering at the University of Cincinnati.

Charlie and his wife, Joy, reside in Old Metairie. They enjoy time with their grandchildren, boating in Georgia and South Carolina, and travel to the English countryside.

Robert W. Whelove Jr. (MS 1970) is currently retired and living in Davenport, Iowa, where he is the co-coordinator of Evangelism at the Newcomb Presbyterian Church of Davenport. He recently had this to say about LSU: "If I had a son (which I do not), and he was interested in engineering, I would encourage him to check out LSU ChE because of the outstanding unit operations laboratory. I am sure therein, the formulas you learn about in the text books come alive!!! I would gladly pay out of state tuition for him for the superior education that he would receive at LSU. There is nothing that beats a 'hands on' education. P.S. My daughter wants to become an acute care pediatric nurse practitioner. [She is a] junior at the University of Iowa."



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

John W. Holeman, BS 1943, MS 1948

Herman "Mack" Ingle, MS 1961

Harold D. Jelks, BS 1959

Wilber A. Kean, BS 1953

Stewart B. Olive, BS 1948

Wilbur "Bill" Riehl, MS 1950

Darrell Rivers Sr., BS 1985

Jacob J. Trachtenberg, MS 1952

Lufra J. Trahan, BS 1934

Frank P. Turk, BS 1934

Earl E. Turner, BS 1936

Albert Wehe, BS 1952

In Memoriam

"He was a true gentleman and a good man."

Earl E. Turner Sr., a member of the "Greatest Generation," died on Thursday, March 27, 2014, at the age of 100—having been born to Arthur and Mattie Turner in Slaughter, LA, on July 14, 1913. He was a graduate of Istrouma High School and graduated from LSU in 1936 with a bachelor's degree in chemical engineering. While on the ROTC boxing team, he was offered a four-year scholarship on the LSU boxing team. He lost only one fight in four years and was team captain his senior year. He was a company commander in the ROTC and attended US Army Chemical Warfare School at the Edgewood Arsenal in Maryland. In 1936, he married Tennie Mae King from Baker, LA, and went to work for Humble Oil in Baton Rouge. He was a member of the Louisiana National Guard, and his unit was activated in 1941 for World War II. He served in the US Army Chemical Corps, and was stationed in Washington, D.C. from 1941-45. He was Chief of Branch of the Chemical Corps obtaining the rank of Lieutenant Colonel (LTC). After the war, he remained in the Active Reserves as Director of the Chemical Corps School until 1957 and was subject to a 30-day call up during the Korean War, but was never activated. He went on inactive reserve status in 1957 and retired from the US Army Reserves in 1973 with the rank of LTC. While at Humble Oil, ESSO Research Laboratories, he and Tennie Mae enjoyed many varied and interesting assignments. For two years in the 1960s they resided in Rifle, Colorado, for a special research program connected with Oil Shale Rock and the extraction of oil. In 1969 they resided in Nova Scotia, Canada, for another research project involving iron ore development. In the early 1970s they were sent to Marsa El Brega, Libya, on a two-year assignment for ESSO International, where he was the supervisor of a new liquefied gas unit that was under construction. After the plant was nationalized by Libya, they spent considerable time traveling in Europe and the Middle East. In 1974, Mr. Turner retired from Humble Oil and Refining ESSO Research Labs, which is now ExxonMobil. After Tennie Mae's death in 1975, he married Daisy Bankston, his widow, with whom he shared a continued busy, rewarding, and productive life traveling all over the world until his death. He was a proud member of the LSU "L" Club and was an enthusiastic supporter of all LSU sports.

*Published in The Advocate from March 28-31, 2014. More information is available **here**.*

John William Holeman of Baton Rouge lived 90 years, always faithful to his God, his family, and his work. He died September 7, 2013. Born in Shreveport, John received his bachelor's degree in chemical engineering at LSU in 1943 before enlisting in the US Navy. He served in the Pacific Theater until World War II ended, then returned to LSU for his master's degree under the GI Bill. He married Katherine Yvonne Wilson of Baton Rouge in 1946. That year, John went to work with Kaiser Aluminum in a career that allowed him to take his family across the country and around the world. His crowning career achievement was leading the Kaiser Engineers team in the design, construction, and startup of an alumina plant in Gladstone, Australia, that would become the largest such refinery in the world. In retirement, the couple returned home to Baton Rouge, but they never retired from church work and service for their Lord. Each taught Sunday School classes until health prohibited. In their career travels, they supported small churches and helped start several more. After retirement, they went on a one-year mission to Zimbabwe, Africa. Perhaps the ministry that meant the most was their testimony of faith as a Christ-centered home for their own family.

*Published in The Advocate from September 10-13, 2013. More information is available **here**.*

Herman "Mack" Ingle Jr., 81, of Baton Rouge, Louisiana passed away at Baton Rouge General Hospital on Saturday, September 7, 2013, after a short, but gritty, battle with cancer. Born on December 30, 1931, in Carlsbad, New Mexico, he was the son of Herman Mack and Mildred Nymeyer Ingle. In 1954, he earned a bachelor's degree in chemical engineering from University of New Mexico in Albuquerque, New Mexico. In 1961, he earned a master's degree in chemical engineering from LSU. Mack served in the US Air Force from October 1954 until October 1957 when he was honorably discharged as a First Lieutenant. In 1955, while stationed in Texas, he met and married Joanne Malone. After living in Biloxi, Mississippi and Montauk Long Island, New York, they relocated to Baton Rouge in 1957. They were married 57 years until her passing on May 11, 2013. Mack was a proud employee of Ethyl Corporation/Albermarle. He began his long career at Ethyl in December 1957 as a chemical engineer in research and development. Before retiring from Ethyl in January 1994, he also worked in Plant Operations, Design, Construction & Start-ups, and Planning & Coordination of the Manufacturing Department. Mack and Joanne shared a passion for travel and enjoyed many years of international travel visiting all seven continents and over 75 countries. He enjoyed photography and took many special pictures during their travels. Mack, working closely with Joanne, was among the founders of the Baton Rouge Chapter of the American Association of Individual Investors (AAII).

*Published in The Advocate from September 10-13, 2013. More information is available **here**.*

Etienne de Boré's Sugar Kettle: A sweet chemical engineering story

Etienne de Boré

de Boré's Sugar Kettle

Standing aside the sugar kettle in your cap and gown graduation regalia with diploma in hand, you had your picture taken with family and maybe a professor or two. Commemorative plaques in both French and English set in the background in the crepe myrtle trees with their Sugar Kettle inscription. You walked past it daily, going to and from class and read the inscription at least once during your time on campus. But soon you were overcome by the familiar "spell" of living in the present and you completely ignored it, thereafter. Ignored it to the point if someone asked, you likely couldn't recall why the fuss with the kettle and who was Jean Etienne Boré anyway? And such a spell I was under; it sits just beyond the windows of my office I have occupied for nearly a quarter century. A few days visit to New Orleans on LSU spring vacation this past April changed all that.

One of my hobbies is reading Louisiana History and at the time I was re-reading George W. Cable's 1884 book entitled "The Creoles of Louisiana" (Cable, 2000). Chapter 15 was on how Boré made sugar. An interesting read but, what happened coincidentally, jolted me out of my lingering sugar kettle familiarity spell. Whit and Maureen Huguley offered their New Orleans, Vieux Carre, 525 St. Louis Street apartment to me and Joyce for three days. They are extended family members, Whit is a molasses commodity trader. Molasses is that dark, syrupy, sweet food by-product of sugar making in addition to bagasse. He is a Tulane graduate but, their son Whitfield Jr. and wife Maureen McLindon, are LSU Alumni. She is the daughter of Professor Gerald McLindon, deceased and former Dean of LSU School of Landscape Architecture.

The apartment on the ground level is one of three in the building. It is beautifully decorated with sugar sacks and related antique objects with a New Orleans flare. Inside is a document folder with information on its history and the early property owners. Whit thought it was interesting to learn that the condo, which was also used for the molasses business, is located on property once owned by Boré and being so retains a connection to the history of the Louisiana sugar industry. A brass plaque attached to the front entrance is inscribed with the title "Jean Adrien Delpit House" and reads: "Erected together with the adjacent building at 525 St. Louis Street by Etienne Deban who acquired both properties in 1807 from Jean Etienne Boré, Claude Gurlie and Joseph Guillot, builders."

The trading business with which Whit is employed, now goes by the name of ED & F Man Liquid Products and molasses remains a main product, other big businesses are sugar and coffee. In 1940 his grandfather, Authur Whitfield Huguley Jr., and a Harvard classmate started a sugar beet molasses company, Industrial Molasses Company. Building storage tanks at factories accommodated the seasonal, very erratic huge surpluses being given away during the harvest but in short supply in the off season. Molasses was deemed a "strategic" commodity for the war effort. After WWII, in 1945, the company was consolidated with a New Orleans cane molasses company. With the growth of business in 1950s the company became the first tenant in the Port of Baton Rouge, building a molasses terminal. Whit convinced his father, the then President in 1988, to consolidate offices in New Orleans because he was "pretty sure Maureen would not move to New Jersey." Eventually, the company headquarters was moved from the New York City Area to New Orleans. In 1995 it became a totally owned subsidiary of ED & F Man, based in London, which is the largest global molasses trader/distributor and one of the largest sugar and coffee traders. The molasses tanks still used for storage may be seen today from the I-10/Mississippi River Bridge in-between the bridge and the grain elevator to the south. Whit's office is on Canal Street in New Orleans.

Now back to Etienne's Story, not sure when and for what reason the "de" was added to Boré. Nevertheless George W. Cable tells it best, the following is a quote from Chapter 15:

"…Still the Creoles, every year less than the year before to make rash experiments, struggled against the misfortunes that multiplied around the cultivation of indigo, until 1794 found them without hope.

"At this juncture appeared Etienne de Boré. He was a man of fifty-four, a Creole of the Illinois district, but of a distinguished Norman family; he had lived in France from the age of four to thirty-two, had served with the king's mousquetaries, had married a lady whose estate was in Louisiana near New Orleans, and returning with her to the province, and had become an indigo planter. The year 1794 found him face to face with ruin. His father-in-law, Destrehan, had in former years been one of the last to abandon sugar culture. His wife and friends warned him against the resolution he was taking; but he persisted in his determination to abandon indigo, and risk all that was left to him on the chance of a success which, if achieved, would insure deliverance and fortune to himself and the community. He bought a quantity of canes from Mendez and Solis, (Spaniards who raised the seed cane) planted on the land where the Seventh District (late Carrollton) now stands, and while his crop was growing erected a mill, and prepared himself for the momentous season of 'grinding.'

"His fellow-planters looked on with the liveliest—not always with the most hopeful—interest, and at length they gathered

Etienne de Boré's Sugar Kettle: A sweet chemical engineering story

about him to see the issue of the experiment in which only he could be more deeply concerned then they. In the whole picturesque history of the Louisiana Creoles few scenes offer so striking a subject for the painter as that afforded in this episode: the dark sugarhouse; the battery of huge caldrons, with their yellow juice boiling like a sea, half-hidden in clouds of steam; the half-clad, shining negroes swinging the gigantic utensils with which the seething flood is dipped from kettle to kettle; here grouped at the end of the battery, the Creole planters with anxious faces drawing around their central figure as closely as they can; and in the midst the old mousquetaire, dipping, from time to time, the thickening juice, repeating again and again his simple tests, until, in the moment of final trial, there is a common look of suspense, and instantly after it the hands are dropped, heads are raised, the brow is wiped, and there is a long breath of relief—'it granulates!'

"The people were electrified. Etienne de Boré marketed $12,000 worth of superior sugar. The absence of interdictions that had stifled earlier trade enabled him to sell his product to advantage. The agriculture of the Delta was revolutionized; and, seven years afterward, New Orleans was the market for 200,000 gallons of rum, 250,000 gallons of molasses, and 5,000,000 pounds of sugar. The town contained some twelve distilleries—probably not a subject of unmixed congratulation—and a sugar refinery which produced about 200,000 pounds of loaf sugar; while on the other hand the production of indigo had declined to a total of 3,000 pounds, and soon after ceased".

Jean Etienne Boré was a chemical engineer, surely. The existence of crystals formed while boiling cane juice was well known for a long time by chemists. Prior to de Boré, sugar was made but not of a sort to ship to world markets, it was poorly granulated and very wet, only good for local consumption. Half the first cargo in 1765 headed for France leaked out of the packages before the vessel made port.

Engineering chemicals requires a clever series of connected process steps, for sugar heat transfer from a fire under the kettle drives off much of the water quickly. Mass transfer in the thick and hot liquor that is slowly stirred just so, to encourage a "reaction," in this case the initiation and growth of solid sucrose from tiny specks to large crystals. They solidify from the supersaturated liquor solution. The next step was one of fluid dynamics, it removes the surrounding, sugar-exhausted liquor (aka "molasses") residue that clings to hard crystals. It is "filtering" and washing with a little fresh water removes the final bits of the residual liquor yielding raw sugar. And then finally drying (aka, heat transfer, again) the product gently, and placing the elegant golden crystals in cloth bags. Sugar refining would be developed later to produce white crystals. Raw sugar however, is still available.

The exclamation "it granulates" was the response to note that large crystals could be produced but only by a lengthy series of individual process steps. Sugar factories are complex machines that connect and integrate sequential chemical engineering processes, it's more than just boiling a batch of syrup, clearly. I know because in the fall semester of 1961 I took Chemical Engineering 161, a two semester-hour course required of all undergraduates, entitled Chemical Engineering Practice Laboratory. It was held in the Audubon Sugar Factory adjacent to and on the east side of the old chemical engineering building. A Sugar Engineering Degree was still popular.

Cane is harvested in the winter months. At that time mules still pulled wagons full of canes into the factory yard from the LSU farms where they were grown. Strained from the effort, their exhaled breath condensed in the cold morning air. Wood and bagasse fired in steel barrels gave warmth to black field workers gathered about. The wagons were lined up in the street front of the factory, waiting their turn at the crane to be unloaded into the hopper with rotating blades that sliced the stalks prior to crushing and squeezing between heavy rollers. Inside the factory workers made sugar, we watched, took notes and learned how a sugar factory operated. The golden sugar granules were taken away in a railroad hopper-car. It was a magical time for me.

de Borés' kettle is at the root of this sweet story but it doesn't end there. The sugar industry remains economically significant in the State of Louisiana. The story continues and has a special meaning, not just to the current graduating class as an excellent place for a photo-op, but also to us older LSU Alumni who return for a brief visit after a football game or whatever, and notice it. Then it becomes a catalyst which causes us to reflect on what a magical time it was being a chemical engineering student at this place called LSU.

It is an iconic symbol of the Cain Department of Chemical Engineering at Louisiana State University. Hopefully the kettle will be moved and installed in a prominent place adjacent to the site of the new building that will house the Department.

Louis Joseph Thibodeaux, BS 1962

Literature cited: Cable, G.W. 2000. THE CREOLES OF LOUISIANA. Pelican Publishing Company, Gretna, LA. [Copyright 1884 First Edition by Charles Scribner's Sons.]

Laboratory and residence of the LSU sugar experiment station at Audubon Park in 1899

Burnside Plantation Sugar Mill

Opportunity to Give

WE WOULD LOVE TO HEAR FROM YOU!

Please complete and return the following information to:
Cain Department of Chemical Engineering
Rachel Landry
110 Jesse Coates Hall
Louisiana State University
Baton Rouge, LA 70803

You may also submit the information electronically to **relandry@lsu.edu**.

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