

THE CAIN DEPARTMENT OF
CHEMICAL ENGINEERING

ALUMNI MAGAZINE

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LSU



Dear Friends of the Department,

Hello from Baton Rouge! We had a great turnout for the junior/senior presentations in the spring. More than 100 volunteers, all engineers and many alumni of our department, served as judges for the junior- and senior-level design presentation. I am always proud to see our alumni back on campus and to see another batch of new engineers complete their plant design project. The process from high school graduate to engineer is truly transformational. Our faculty and staff get to play a role in the transformation, but it is the dedication of each student that makes the process work. It isn't easy, but most things that are valuable aren't easy.

In this newsletter, you will find introductions to two new faculty—Jose Vargas and Yaxin An. You will also read about the retirements of two outstanding faculty members—Harold Toups and Armando Corripio. Armando actually retired years ago, but he has been teaching our plant design course as an adjunct instructor for a long time. In total, this past semester completes 54 years of service to LSU. All of Dr. Corripio's former students are welcome to attend a special last lecture in his honor this fall.

You will also learn about new investments in our unit operations lab. This lab and the faculty who run it are some of the best in the world. I know of no other UO lab with two 21-foot distillation columns and industry-standard control systems. In fact, we may be the first UO lab to run a smartphone app connected to our new DCS system! Imagine faculty asking students to check the condenser temperature on their phone. What? You want me to use my smartphone in the lab? Yes, but for something useful this time...

You will also see some great examples of research in our department and how it impacts Louisiana and the world. The value of this research is hard to quantify, but it is critical for our future. In one example, Kevin McPeak (ChE), Phil Sprunger (Physics), Noémie Elgrishi (Chemistry), and I are working on a process to convert CO₂ into chemicals like ethylene using renewable energy. This sort of research is critical for Louisiana, and it is important that LSU leads the way.

I hope you will stay connected with the department. Let us know if you would like to serve as a judge of the junior/senior presentations or if you would be willing to help with a class project. We are always happy to hear from alumni and always willing to host a visit. Just let us know the next time you are in Baton Rouge.

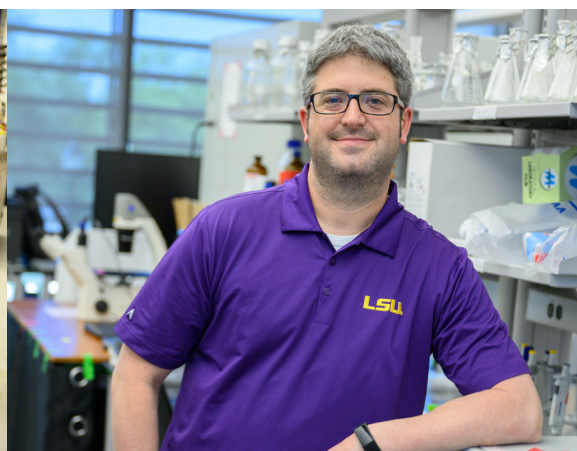
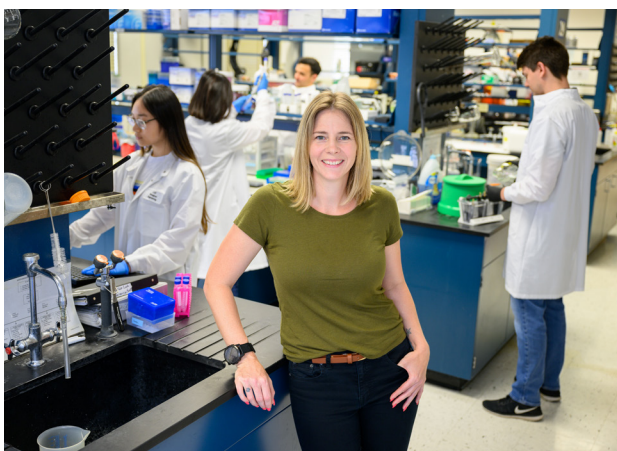
Best Wishes,
John Flake

Chair and Professor
Cain Department of Chemical Engineering





LSU BE, ChE Team Study Drug Resistance in ER+ Breast Cancer Cells



Estrogen receptor-positive (ER+) breast cancer is the most common type of breast cancer diagnosed today. When someone has ER+ breast cancer, the cancer cells' growth is facilitated by the estrogen receptor. In breast cancer, hormone receptors (proteins located in and around breast cells) signal cancerous cells to grow uncontrollably, resulting in a tumor.

According to the American Cancer Society, two out of three breast cancer cases are hormone receptor-positive with 60-70% of those cases being ER+. Targeted therapies exist for ER+ breast cancer, however, nearly half of those patients will become resistant to endocrine therapy. Thanks to a \$140,000 grant from the National Cancer Institute, two LSU professors and their students are researching what causes this resistance to treatment.

LSU Biological Engineering Assistant Professor Elizabeth Martin, who is the principal investigator on the NCI research project, says that while ER+ breast cancer is more likely to respond to endocrine therapy, 40% of ER+ patients become resistant to this treatment.

Endocrine therapy directly targets the estrogen receptor unlike chemotherapy, which can target proliferating cells in the body, including healthy cells.

"Either patients already had resistance to the endocrine treatment or acquired it over time," Martin said. "Unfortunately, when there is resistance in the ER+ cells, it can be seen after the cancer cells have metastasized and moved on to another organ."

LSU Chemical Engineering Associate Professor Adam Melvin, who serves as the co-PI on the project, says that they are not so much studying resistance at the primary site, but the journey from point A to point B as the cancer cell metastasizes or moves to another spot in the body.

"The hypothesis we have is that the cancer cells pick up mutations [so that they go] from being susceptible to endocrine therapy to being resistant," he said. "How does it become resistant?"

One thing that could make them change, Melvin added, is fluid shear stress. This occurs as the cell moves through the vasculature, putting pressure on the cell. Prolonged exposure to this pressure can cause the cell to mutate, which can make it stronger. Melvin compares it to someone going down a waterslide where the fluid velocity of the water puts more pressure on the body.

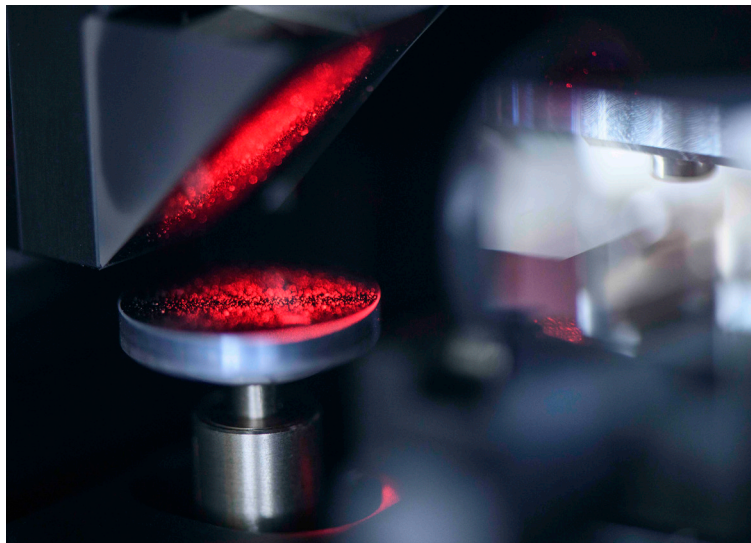
"We think the fluid velocity pushing on that cell induces mutations, and we think that stressful environment on the cell is causing it to develop this resistance," he said.

Martin says the ultimate goal of this research is to understand how to re-sensitize cancer cells to endocrine therapy so that patients don't need to move to treatments like chemotherapy.





LSU Engineering Faculty Work to Develop Water Treatment for Wells



As of 2019, 43 million Americans did not have access to public water systems and relied on private wells. Indeed, a 2015 report by the United States Geological Survey (USGS) showed that 11-30% of residents in Louisiana got their water supply from private wells. The national average was 14%.

Unlike public water systems, these wells are not regulated and present an increased health risk from waterborne contaminants like pesticides, herbicides, and even sewage. In addition, because these wells are dug out of necessity due to lack of access to public utilities, those facing a health risk are also usually at a socioeconomic disadvantage.

This issue is at the heart of a National Science Foundation Partnerships for Innovation-Technology Translation (PFI-TT) project by LSU Chemical Engineering Associate Professor Kevin McPeak and LSU Civil and Environmental Engineering Assistant Professor Samuel Snow. The pair are working with Troy Smith at Kingdom Technology Services in Houston. Smith has decades of experience in the UV water treatment business and will advise on the project.

What the project will do is develop a new water treatment system that simultaneously treats odorous water, recalcitrant organics (e.g., pharmaceuticals), and biological pathogens using ultraviolet (UV) light and without the addition of

chemicals. Existing solutions typically require multiple treatment systems that add complexities and costs.

“We have shared and complementary expertise with this light-driven technology,” said Snow in reference to his partnership with McPeak. “We will push the limits of our materials to engineer highly compact and efficient chambers that allow us to expose the water to as much ultraviolet light and the photoactive surfaces as possible. The process uses only oxygen dissolved in water, plus the UV light to transform the rotten-egg-smelling hydrogen sulfide into harmless, odorless products.”

In addition to the desired practical outcomes of this project, McPeak and Snow aim to advance the understanding of inhibiting agents in photocatalytic water treatment systems. This knowledge is critical in developing a robust photocatalyst for water treatment. Among the techniques they will employ in this project is the use of a scanning near field optical microscope (SNOM), a one-of-its-kind piece of equipment awarded through an NSF MRI grant in 2020. The device’s unique nano-Fourier transform infrared spectroscopy capabilities will be utilized to probe and better understand fouling on the water’s photocatalyst surfaces with nanoscale mapping capabilities.



LSU Chemical Engineering Alumnus Becomes Macy's CFO

Problem solving and critical thinking can lead someone down many career paths, whether it be engineering, business, or in the case of one LSU alumnus, both. LSU Chemical Engineering alumnus Adrian Mitchell has utilized his engineering and business degrees to become chief financial officer of iconic retailer Macy's Inc., during one of the most challenging times in the company's 164-year history.

Born in Jamaica and raised in Baton Rouge, Mitchell excelled in math and science during high school, which made chemical engineering a natural next step, he said. In 1996, he earned his bachelor's degree in chemical engineering from the College of Engineering, along with a minor in chemistry.

"At its core, chemical engineering is all about problem solving and critical thinking," Mitchell said. "My time studying chemical engineering got me comfortable with numbers and looking at problems from different angles. I've used those core principles throughout my entire career."

After graduating from LSU, Mitchell took a job at McKinsey & Company, a global management consulting company based in Chicago, where he worked with clients on large-scale transformations in the consumer space.

"I found my passion for retail after my first case study and knew that was the direction I wanted to take in my career," he said.

Mitchell then left McKinsey to earn his MBA at Harvard Business School.

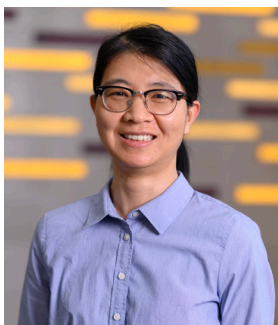


"What was most impactful with my Harvard Business School experience was translating the engineer mindset on problem solving into a business context," he said in a 2020 Bloomberg interview. "It was really a magical experience."

"In today's ever-changing world, you must be able to quickly and efficiently adapt to different situations," he said. "Never stop learning, remain curious, ask thoughtful questions, and be open to new ways of doing things. Leaning into situations where you may not be comfortable is where you grow both as a professional and as a person. I'd also encourage college students to think outside the box when it comes to choosing a career. Take the time to explore all avenues so that you choose a path that pushes you to learn something new every day."

New Faculty

Yaxin An - Assistant Professor



Dr. Yaxin An comes to LSU by way of Princeton University, where she has served as a post-doctoral scholar since 2021. She received her BS in chemical engineering from Central South University, China. She earned her MS in ChE from Tianjin University, China, then traveled to Virginia, where she earned her PhD in ChE from Virginia Tech in 2020.

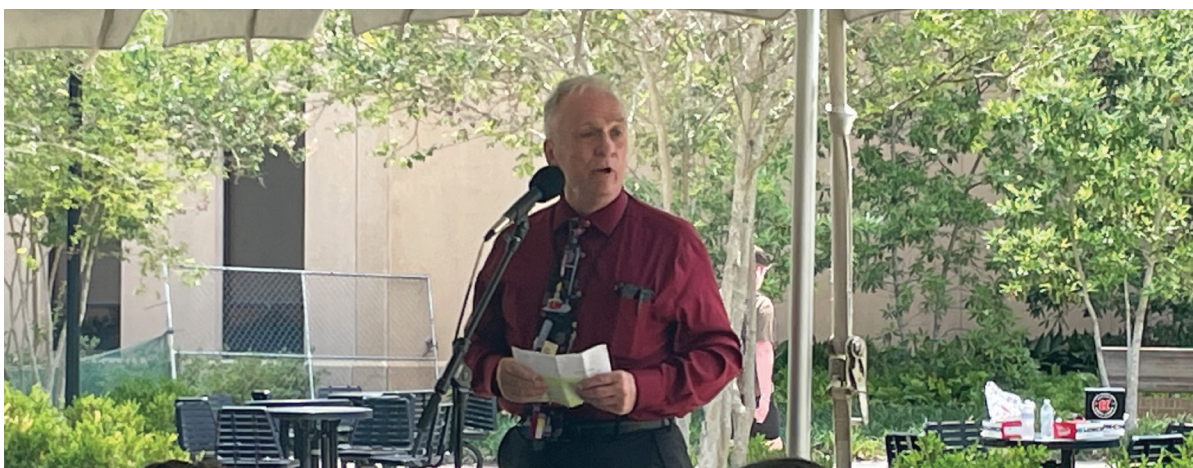
Jose Vargas - Professional in Residence



Dr. José Vargas joins us after a distinguished career at ExxonMobil. For nearly 40 years, he worked in Exxon plants around the world. He will be replacing Dr. Harry Touns as the primary instructor for CHE 4162 Unit Ops Laboratory, commonly referred to as Senior Lab.



Harry Toups Announces Retirement



The department hosted a lunch honoring Dr. Harry Toups on May 5, 2022. After 19 years with LSU, Harry announced that he will retire at the end of the spring 2022 semester. We held the lunch under a tent just outside of Patrick F. Taylor Hall, and around 100 industry

volunteers, faculty, staff, and former and current students celebrated his outstanding teaching career. We all thank Harry for his service to LSU, the department, and mostly to his students. He was a tireless instructor and positively impacted the lives of hundreds of students over the years. He will be greatly missed. Harry left us with these final thoughts.

The Dream of Teaching

The notion of teaching is a thread that has run through my life from my very early days. I grew up in a multigenerational household with my maternal grandmother, a life-long elementary school teacher. My school chums always credited my success with that fact, and it would be hard to fault them for that conclusion. Heck, I even attended her eighth-grade summer school when I was in fourth grade, although I think that was just Mama's ploy to get at least one of her kids out of her hair for a while. I want to believe I paid Grandma back later when I helped her with her teacher recertification in her 70s. I helped my dad with math and circuits when he attended trade school. My wife and I taught courses on marriage to high schoolers. And a Motivated Abilities Inventory I took mid-career at ExxonMobil indicated a strong affinity for teaching.

The Great Fail

So...

Some 19 years ago, like Tina Turner, I "left a good job in the city"—in my case—for a second career, teaching ninth-grade physical science. Long story short, I flunked out, and quickly. Perhaps I should have known better. Two of my brothers-in-law, who were teachers, warned me of the difficulties I would experience. And though the school's principal thought I was doing well, I knew differently. Like Michael Jordan, who struggled to hit a major league curveball, I lacked a critical skill. In my case, classroom management. Faced with the most significant and visible failure in my life, I did not feel like I was the master of my fate or captain of my soul.

In the wake of this, I had to set aside many deeply embedded attitudes, like "I can do anything that I put my mind to," or "I know better than those with experience," or "I don't ever need help," or "I have to do things perfectly," and, especially, "I can make a room full of hormonally-charged adolescents pay attention."

All of Life is Preparation and the Love of a Good Woman

There I was, at age 55, with no job, looking to my wife like warmed-over death. Out of blessed inspiration, she found the job posting for this position, and two weeks later, I was an instructor in the Unit Operations Lab. My massive failure soon became a distant memory because, as Thomas Edison once said, "Every wrong attempt discarded is another step forward."



Looking back on my resume, I can see that I spent 38 years in college and industry—and even that short shift teaching high school—unwittingly preparing for the Unit Operations Laboratory position, with stints in research, design, instrumentation, and safety. Like David, who prepared unbeknownst to himself for his bout with Goliath by protecting his father's flocks from lions and bears, I was training all those years for this.

Passing on Some Wisdom

- I lay no claim to being a wise person, but at the risk of being handed a soft drink laced with hemlock, let me offer this brief string of pearls:
- A profound failure does not have to define you; it may just be a wrong attempt before moving forward.
- One doesn't always know what one is preparing for in life, so value your current engagement.
- You might have a dream or a meaningful thread running through your life that you are not always consciously aware of. Do not be afraid to embrace it when it shows itself.
- Never underestimate the power of someone who truly loves you and hates to see you lost and depressed.
- In all of this, I see the role of Providence. However, the Providence I speak of is far more personal than that of

Edison. I believe in a Providence more like David's, a Providence who saved me from calamity more than once and a Providence to whom I am forever indebted.

Local Indebtedness

Speaking of indebtedness, I am deeply indebted to my many faculty colleagues in chemical engineering. From day one, they have—to a person—treated me with the most extraordinary respect and kindness, and many of them have become close friends. We have taught, laughed, strategized, sympathized, bowled, and even run a marathon together. I also am indebted to the department and college leaders who have offered unwavering support and personal encouragement.

My Greatest Joy

In these past 19 years at LSU, my greatest joy has been working with, learning from, and seeing students succeed. This joy is the genuine joy people with a heart for teaching seek.

To all of you who have been my students, I want to say, if I ever failed to allow you the opportunity to learn everything you wanted to know and understand, I apologize. Still, I can readily see that you survived that and thrived anyway.

Final Words

Finally, in memory of my grandmother Anna Eliza Daly, my initial inspiration, I offer you this Irish blessing:

May the road rise up to meet you. May the wind be always at your back. May the sun shine warm upon your face, the rains fall soft upon your fields, and until we meet again, may God hold you in the palm of His hand.

P.S. Chemical engineers can do...anything!



Armando Corripio Achieves 54 Years of Teaching ChE at LSU



LSU Chemical Engineering Professor Emeritus Armando Corripio's life story is nothing short of inspirational. From fleeing his native Cuba during Fidel Castro's reign to becoming a professor in an unfamiliar country, Armando has proven that if you work hard and keep your eye on the ball, good things will come. This year, he has decided to end his work as a part-time instructor after retiring in 2005, a total of 54 years of teaching at LSU. His lessons have been invaluable to not only his students, but to anyone needing a bit of motivation to follow their dreams.

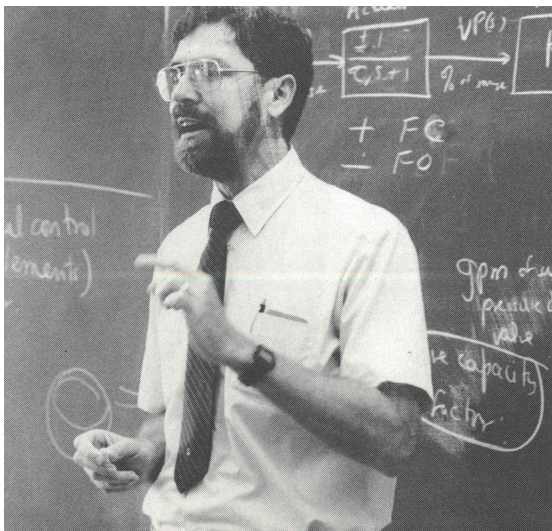
Armando's story begins in 1941, when he was born in the tobacco-growing town of Mantua in western Cuba. Cuba was prosperous at the time with a "great standard of living," Armando says. His hard-working father owned a successful store that sold everything from gas and groceries to clothes and shoes, and his mother's family owned a small ranch a few miles outside of town. At the age of seven, Armando moved to Marianao, a major suburb of Havana, to attend the Colegio de Belen, one of the most prestigious elementary and secondary schools in Cuba.

His father, who only had a fourth-grade formal education, taught himself enough accounting to

do the books for the store and helped Armando with his math homework. One thing that amazed Armando was that his father was able to solve algebraic word problems without using algebra. His techniques were akin to many chemical engineering techniques Armando learned later, such as defining a basis for calculations.

At the Colegio de Belen, Armando finished with the highest overall grade-point average of the class during his 10 years at the school (valedictorian). He referred to his high school years as "very shaky ground," due to Castro taking over Cuba. "When I finished high school, most universities were closed due to the rebellion," Armando says.

After enduring many hardships during Castro's regime, Armando fled from Cuba to Miami in 1961. The US government offered Cubans in Miami a free one-way ticket to a US city of their choice. It was a huge decision for most, since it meant deciding where they wanted to live in a country they had never been to. "A friend of mine, Alfredo Lopez, said we can go to LSU with a loan from the federal government, which was \$500," Armando says. "That covered tuition and everything at the time."



Armando boarded a plane to Louisiana and continued his studies in chemical engineering at LSU. Upon receiving his BS from LSU in 1963, Armando got a job with Dow Chemical Company, Louisiana Division, where he specialized in process simulation and automatic control. His first big success at Dow, less than two years after he joined the company, was the dynamic simulation of a 30-mile-long brine line using an analog computer.

Later, Armando and Enos Bonham developed two computer programs to design multiple-effect caustic evaporators and a gas turbine combined-cycle power plant under Boyd Roane's direction. These programs were used at Dow for decades in designing and operating a Chlor-Alkali plant. While consulting for Dow in 1977, he developed, in cooperation with Dow's Dave Bretton, a computer program to design a coal gasifier with a gas turbine combined-cycle power plant.

Armando's five years in industry were extremely influential and instrumental in his getting a well-grounded view of chemical engineering, as he was also taking graduate courses in the eve-

ning during this time. He was able to bring his field experience to the subjects he was taking in graduate school—automatic process control, heat transfer design, fluid mechanics, distillation design, optimization—and to apply what he was learning in his modeling and design work.

During his second semester of graduate school, Armando took a course on process control from LSU Chemical Engineering Department Chair and Professor Paul Murrill, who wanted Armando to consider getting his PhD at LSU. "After five years, I followed his advice and found out he was right," Armando says. "Murrill helped by giving me an instructorship in the department in 1968. So, I took my courses, worked on my dissertation and finished in one-and-a-half years."

Armando earned his PhD in chemical engineering from LSU in January 1970. Thanks to a US Air Force Scientific Research grant secured by Murrill, he spent 1970-1978 teaching Analog/Hybrid Simulation and Automatic Process Controls to juniors using a new hybrid computer—the EAI 680 analog operated by SDS Sigma 5 digital computer.





In 1978, Armando took a sabbatical and worked for the Massachusetts Institute of Technology (MIT) in Cambridge, where he developed the Aspen Process Simulator and aided in computer control and process design. When he returned to LSU in 1979, Armando continued teaching undergraduate and graduate courses and was promoted to professor in 1981. From 1984 to 1993, he partnered with IBM to deliver training to students and practicing engineers in the Advanced Control System.

He also taught several ACS courses in Brazil and Israel between 1985 and 1990, when IBM sent him around the world to promote the ACS program. Also, around this time, LSU College of Engineering Dean Ed McLaughlin put Armando in charge of the Central American Program for Undergraduate Scholarships (CAMPUS), sponsored by the US Information Agency, in which he worked with 10 students from Panama and Nicaragua.

In April 1990, he received the Charles E. Coates Memorial Award from Professor Frank Groves, which Armando says, “was an honor to receive.” When the IBM program became outdated, as was common with computer software, Armando taught the senior course, Plant Design, from 1993 until his retirement in 2005. “It was a great opportunity to pass on to them what I had learned from my professors,” he adds.

Though officially retired, Armando continued teaching one senior course five mornings a week at LSU. “I really like teaching at LSU,” he says. “Especially since this is the only course I teach, and I teach it every year. Not only have I acquired experience teaching it, but I’ve also worked in that industry. I like meeting the students. They never get old.”

During his 54 years of teaching, Armando strived (and succeeded) at being the kind of mentor that





Suárez and Murrill were to him. He has never regretted his decision to become a professor and leave the industrial realm. The most enjoyable phase of his career, as well as the most significant aspect of his career, has been as a teacher. He enjoyed acquiring and teaching skills to students who became chemical engineers. In addition, he enjoyed learning new skills required to teach his students with the latest techniques. Many of the skills at which he became very good—like slide-rule calculations, analog and hybrid simulation, and Fortran programming—are now obsolete. This, however, allowed him to acquire new skills, like Mathcad and MATLAB programming, spreadsheets, DCS control applications, and PowerPoint presentations. He exclaims, “This has sure made life very interesting.”

All the knowledge that he has imparted to his students over the years through his classes and his research program are his most significant contributions to the profession and society. “I helped them become productive and ethical in their jobs of designing and operating chemical plants,” Armando says, adding that “four of these are my two sons, Bernardo and Michael; my son-in-law, Michael Nodie; and my grandson, Roman.”

Armando would like to be remembered as the “teacher who helped his students become the chemical engineers and citizens that they are. (I am already remembered this way by many of them.)” This statement can be counted as true

as evidenced by his many teaching awards and accolades. Throughout his years at LSU, Armando was consistently one of the most popular and most beloved professors in the department, beginning with his first experiences as an instructor. In his second semester of full-time graduate study, he was also teaching as an instructor for the department. His students selected him as their favorite professor.

He always advised new graduates entering the profession “to pledge to practice and transmit the profession of chemical engineering not only and not less but greater and more beautiful than it was transmitted to them” This, he adapts from The Athenian Oath. To students entering the department, he advises that they not select the profession for the potential high salaries, but for the good they can do to society by becoming the best chemical engineers they can be. On a more practical level, he also advises that they concentrate on learning their math, physics, and chemistry as much as possible. In his words, “the real bottom-line is not the grades they earn but how much they learn.”

Armando has touched the lives of thousands of chemical engineering students over the last half century. His kindness and boundless energy will be missed. We are forever grateful to have had the privilege to call him a colleague and, most importantly, friend.



In Memory of Thib



As many of you know, Dr. Louis J. Thibodeaux passed away in August of 2020. Many of you will remember Louis as a dedicated professor who cared about individuals and the “bigger picture” of how we treat the planet. Shortly after his passing, his family and colleagues started working on an endowment in his memory. We set a goal of raising \$100,000 to endow a special award that would support outstanding undergraduates who engage in research related to chemodynamics and the environment. I am proud to say we are almost there. We have raised about 80% of our goal, and I am appealing to all of his former students and colleagues to help.

In this regard, I asked Thib’s granddaughter, Bonnie McLindon Tom, to write a short description about the proposed award. To help, please visit lsufoundation.org/thib and follow the instructions to make a contribution to the “Louis J. Thibodeaux Memorial Fund.” Let’s help make this happen!

--Chair and Professor John Flake

My grandfather was a lifelong learner. Throughout his career, he realized that to help others become lifelong learners, he just needed to spark their innate curiosity. He accomplished this, in part, through his career as a teacher. He taught so many

of us how to think like scientists and that any question you wanted to try to answer was worthy—not just the questions that were big or popular or profitable. He was my co-conspirator and teacher as I learned to ask and answer scientific questions, and as part of his legacy, we are hoping to give other young minds the opportunity to wonder.

Our family—with partnership from many at LSU—is seeking to endow an award that will provide opportunities for undergraduates to conduct research and learn to ask and answer questions about humans’ impact on our planet in a scientific setting. Dr. Thibodeaux believed strongly in undergraduate research as a critical part of a young scientist’s education. We hope to provide a way for those students to gain this experience and for professors to further their work in studies of the environment.

Dr. Thibodeaux left this world better than he found it, and we are hopeful that these students can further his work and continue his vision of making sure our world is a safe and healthy place for generations to come.

--Bonnie McLindon Tom, granddaughter of Dr. Louis J. Thibodeaux

FACULTY AWARDS & PUBLICATIONS



Professor Bharti Recieves Longwell Award for Instructor Excellence



The College of Engineering recently presented the award to five faculty members in recognition of those who make significant contributions to the early years of a student's journey through quality instruction in entry-level engineer-

ing courses. The Award for Instructor Excellence includes a \$4,500 one-time cash award and is open to all full-time LSU Engineering instructors or faculty at the rank of assistant professor or higher. The appointed selection committee used student success rates, departmental support, and teaching philosophy as some of the metrics to evaluate this year's recipients.

Flake receives LSU Distinguished Faculty Award



Professor John Flake received a 2022 LSU Distinguished Faculty Award, which recognizes faculty members with sustained records of excellence in teaching, research, service, and/or any combination of the

three. Any full-time faculty member who has not received this award previously is eligible. In addition to the monetary award, each recipient will receive a commemorative watch from the LSU Alumni Association.

Professor Harry Toups receives a 2022 William A. Brookshire Award for Teaching Excellence



Each year, only two college faculty members are chosen to receive this award, making his selection as a recipient for the second time in five years an outstanding achievement. In addition to the honor of being selected, he received a cash prize of \$25,000!

Dr. William A. Brookshire made a philanthropic commitment to create the William A. Brookshire Award for Teaching Excellence endowment. This award is eligible to full-time faculty members in the College of Engineering. A faculty member must complete at least 12 credit hours of in-classroom teaching an academic year (Fall, Spring) and has to complete at least an additional 12 credit hours of teaching for the year, though this latter 12 hours can be accomplished with either thesis supervision or in-classroom teaching or both. Qualified faculty should thrive on student success, create, and implement new pedagogies and embrace technology to improve the overall in class experience for students. At the core is a deep concern for student success.





McPeak Receives Grant from U.S. Army



Kevin McPeak was recently awarded a grant by the U.S. Army Combat Capabilities Development Command's Army Research Laboratory.

McPeak's proposal, Ellipsometry of Thin Films for Mid-Infrared Optoelectronics, received \$225,000 in funding, which will provide him with two vital pieces of equipment—a J.A. Woollam IR-VASE Mark II Mid-Infrared Ellipsometer and a cryostat with temperature-controlled stage.

This equipment will be used in his research with Ayaskanta Sahu, assistant professor of chemical and biomolecular engineering at the New York University Tandon School of Engineering, to explore transition metal alloy and quantum dot absorbers for mid-wave infrared photodetector applications.

"The mid-infrared wavelengths are a very important area for the Department of Defense," McPeak said. "Being able to detect light in this region is critical for several security applications in the defense sector. There are not many materials that absorb electromagnetic radiation in this region which are also able to efficiently convert the radiation into an electrical signal."

"One of the first steps to solving this problem is understanding the optical properties of new materials for this challenge. The IR-VASE will allow us to do this. There are only a handful of these tools in the US, so having one at LSU opens up an exciting area of research that aligns with DoD interest. Having this tool will help future funding efforts and faculty acquisition and retention."

STUDENT NEWS



STUDENT NEWS



Fall 2021 AIChE National Student Conference



After a year-and-a-half hiatus from attending conferences, we had a large contingent of ChE students attend the 2021 AIChE National Student Conference. Attendees included Jacob Carden, Erin Cochran, Kathryn Dunphy, Emmaline Miller, Sarah Glass, Brennan Lovell, Suzannah Mahoney, Ellen Pack, Leah Potylchansky, Ella Sheets, Seth Talbot, and Rebekah Wood. It was good to see our students having fun and participating in events outside of LSU again.



Our ChE Jeopardy team placed third at this year's AIChE National Student Conference. Team members included, from left to right, Jacob Carden, Brennan Lovell, Suzannah Mahoney, and Leah Potylchansky.



Emma Sheets and Sarah Glass received research awards at the conference. Emma placed second in the Catalyst and Reactions Division while Sarah placed third in the Environmental Science and Engineering Division.





Safety Group



Our department chair, Dr. John Flake, started the ChE Lab Safety Leadership Team to promote a culture of safety in the Cain Department of Chemical Engineering. The team consists of graduate students from each research group. We meet monthly to inspect the experimental labs and discuss any observed hazards. The goal of the group is to proactively handle safety hazards rather than reactively address them after an incident.

Traditionally, safety is the responsibility of the principal investigator and is merely followed by the people working under them. However, with the involvement

of graduate students, there is a shift from simply following rules that keep us safe to understanding why things are done a certain way. There is also a shift in responsibility from a single person to every person that steps foot in the lab.

Additionally, by having a group of peers walk through each lab, the safety culture becomes friendlier and less intimidating. The goal is not to reprimand or punish. Rather, it is to encourage a positive, safe culture. This way, mistakes can be discussed, near-misses can be addressed, and questions can be asked without the fear of a negative outcome.

ChE Junior/Senior Design Project Event



On May 5, the department hosted its bi-annual Junior/Senior Design Project Presentation Event. This semester, more than 80 volunteers from 20 companies and three universities donated their time and energy to evaluate our students' projects. We want to thank the volunteers for their efforts and for making the event a massive success. In past semesters, prior to the pandemic, both the juniors and seniors presented their projects to evaluators using posters. However, this year our seniors presented their projects to evaluators in con-



ference rooms to a larger panel, mimicking the experience they'll have in their careers.

The companies and universities represented were Air Liquide, Auburn University, BASF, Bayer, Bear Process Safety, Celanese, Deltech Corp, Dow, Eastman, ExxonMobil, Formosa, Grace, Honeywell, Lion Elastomers, LSU, Marathon, Methanex, North Carolina State University, S&B Engineering, Shell, Shin-Tech, Total, and Valero.

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

Dr. Jin Gyun Lee, a recent PhD graduate in Professor Bhuvnesh Bharti's research group was one of only three College of Engineering students to receive the college's Outstanding Dissertation Award. He will receive a plaque, a congratulations letter from the dean, and will be able to compete at the university level.

Jin Gyun Lee was born in 1989 in Busan, South Korea. After graduating high school in Busan, he moved to the US and earned his bachelor's degree in fall 2015 from North Carolina State University's Department of Chemical and Biomolecular Engineering. During his undergraduate study, he went back to South Korea and served 22 months of mandatory military service at the Republic of Korea Army. In fall 2016, Lee started his PhD study in LSU's Cain Department of Chemical Engineering. Since joining Professor Bharti's lab as the first PhD student of the group, his research focused on numerous topics in colloids and interface science including developing plant-based ecofriendly materials, understanding adsorption mechanism of colloids at interface and designing



out-of-equilibrium active matters. After completing his PhD study in May 2021, Lee has joined Professor C. Wyatt Shields IV's group at the University of Colorado Boulder's Department of Chemical and Biological Engineering and has been studying active colloids for biomedical applications

In Memory of Alejandro "Sebastian" Cordova

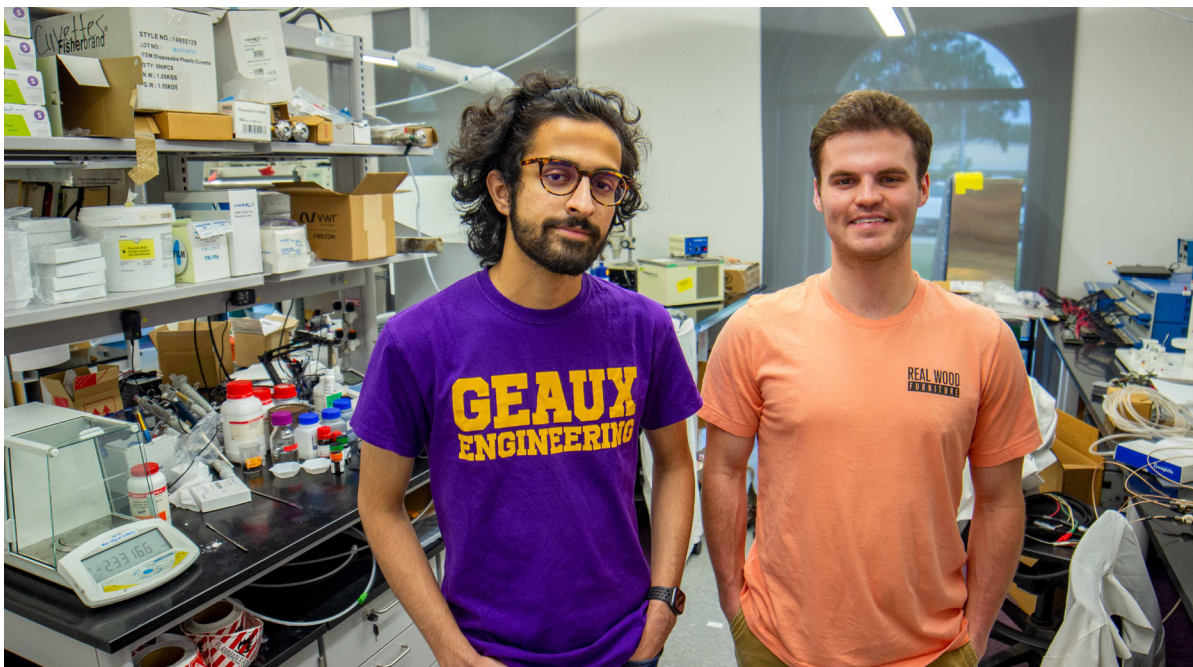


Last spring was a difficult time as we learned about the loss of a dear student. On April 14, 2022, Alejandro "Sebastian" Cordova passed away in an car accident after leaving campus. Sebastian graduated from Catholic High in Baton Rouge in 2019 and was in his third year of our undergraduate program. Sebastian was an outstanding student who was well liked by everyone at LSU. I had the privilege of teaching him thermodynamics the previous spring. It was easy to see that he "got it" and that he loved engineering. His loss was a shocking reminder of the transient nature of life. Memories of Sebastian also remind us of the love between friends, the beauty of learning, and the value of our short time together.

-John Flake, chair and professor in the Cain Department of Chemical Engineering.



Flake, Students Working to Increase Performance in Multi-Chip Packages



How do we transfer data at terabits per second for future applications like autonomous vehicles, phones, and computers?

That question is at the center of a project—sponsored by the Semiconductor Research Corporation—being carried out by LSU Cain Department of Chemical Engineering Chair and Professor John Flake and undergraduate students Hamood Qureishi and Luke Ieyoueb.

The crux of the problem is that the small copper wires, or interconnects, that connect microprocessors are not great conductors when operated at high frequencies. There are also issues with their mechanical reliability.

“A ‘good conductor’ is challenging when you have small wires, crowded electronics, and very high transmission frequencies,” Flake said. “A lot of the signal power is lost due to the skin effect, where most of the electric

current travels near the surface of a wire. In this regard, a smooth surface is desirable, but it isn’t desirable with respect to adhesion and reliability. We are working on processes and materials that would give you great adhesion with smooth interconnects.

“The goal of this project is to provide the basic framework needed for future package-level interconnects. These sort of multi-chip packages will be used in hundreds of applications. Autonomous vehicles are a good example, but these multi-chip packages will likely be used in phones, computers, and many other devices.”

Intel, an SRC member, has already shown interest in the project, Flake said. In fact, this project grew out of previous work he did with the company on removing halides, or chemical compounds that contain halogens, from fluxes used in the packaging process.

STUDENT AWARDS



Five Students Received the Distinguished Communicator Award



2nd Lieutenant Sydney Bradley
Advisor: Mike Benton

Sydney believes that “leadership is the foundational tool for success,” so working to improve one’s leadership skills is paramount for expanding knowledge and learning from other people. Sydney asserts that being able to communicate with others is an “undervalued skill in today’s workforce,” so she pushes herself to be an exemplary leader and succinct communicator. She was a member of LSU’s US Air Force ROTC program and graduated in May 2022 from LSU with a degree in chemical engineering and minors in chemistry and aerospace studies. In her free time, she loves to travel, read and sew. Sydney enjoys serving people and “working toward a goal larger than” herself. She will be commissioned into the Air Force as a second lieutenant and will be an aircraft maintenance officer stationed in Mildenhall, England.



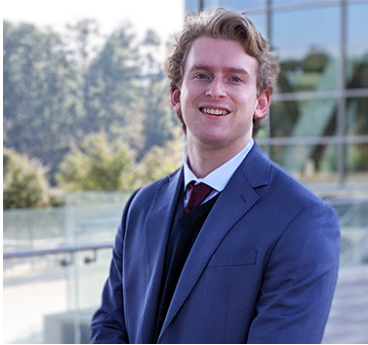
Sarah Glass
Advisor: Adam Melvin

Sarah won the best presentation award at the Rice University Gulf Coast Undergraduate Research Symposium and graduated as an Engaged Citizen and Distinguished Researcher. She founded the Global Water Brigades of LSU, and in her role as president, led the brigade to Panama in March 2022 for service. While at LSU, Sarah was a Stamps Scholar in the Ogden Honors College and was also an LSU Halliburton Diversity Scholar. After graduating in May 2022, she began her doctoral work in environmental engineering at Rice University.



Leah Potylchansky
Advisor: James Dorman

For Leah, a significant take away from her undergraduate career is the formula for work and life balance. Leah served as president of the LSU chapter of American Institute of Chemical Engineers, a member of Tau Beta Pi, Delta Gamma Sorority, and Hillel, as well as completing internships and co-ops with Halliburton, Olin Corporation, and BASF, all while finding time to relax with friends, train her dog, and work out to relieve some stress. Skilled in multimodal communications, Leah has worked with written, spoken, visual, and technological projects on research done in Dean Judy Wornat’s lab and the design of Cumene Production Plants. After graduating in May 2022, she began a full-time position with ExxonMobil as a process contact engineer in Baton Rouge.



Noah Smith
Advisor: Adam Melvin

Dedication to research and communication has been a large part of Noah’s time at LSU. He will be graduating with a degree in chemical engineering and minors in history, chemistry, and environmental engineering with the Ogden Honors College. He is proud to be a Stamps Scholar and a member of Sigma Phi Epsilon fraternity; both of which have impacted his life in a positive way. After graduation, Noah plans to attend graduate school and pursue a master’s degree. Encouraged by his Pop, Noah placed in a poster presentation for a conference associated with the American Institute of Chemical Engineers. His hard work and dedication to research and knowledge impresses all of his loved ones, especially his dad. Noah worked with LSU’s ChemDemo program doing STEM outreach to local K-12 schools to foster an atmosphere of diversity at LSU. He hopes to continue this outreach work during graduate school. Outside of the classroom, Noah enjoys hiking, working out, attending concerts, and playing instruments. Being a Distinguished Communicator has allowed him to grow in his communication skills, which he hopes to use in his future career.



Trevor Thrasher
Advisor: Adam Melvin

When reflecting on his time at LSU, Trevor shared this, “One of my most valuable experiences at LSU has been working as a supplemental instruction leader for the Center for Academic Success. Being able to leave my life at the door a few times a week and go into a session to help those who came always gave me something to fall back on.” For his role with CAS, Trevor was honored as the recipient of the 2021-2022 Dr. Sandra Yancy McGuire Outstanding Supplemental Instruction Leader Award. While doing this work for others, he also completed his Honors Thesis work and graduated from the Ogden Honors College, as well as the College of Engineering. After graduation, Trevor is now in a full-time position with Evonik Industries for their rotational engineer program.

Four Students Graduated with College Honors

Sarah Glass



Nathan Zeringue



Victor Rodriguez-Ortiz

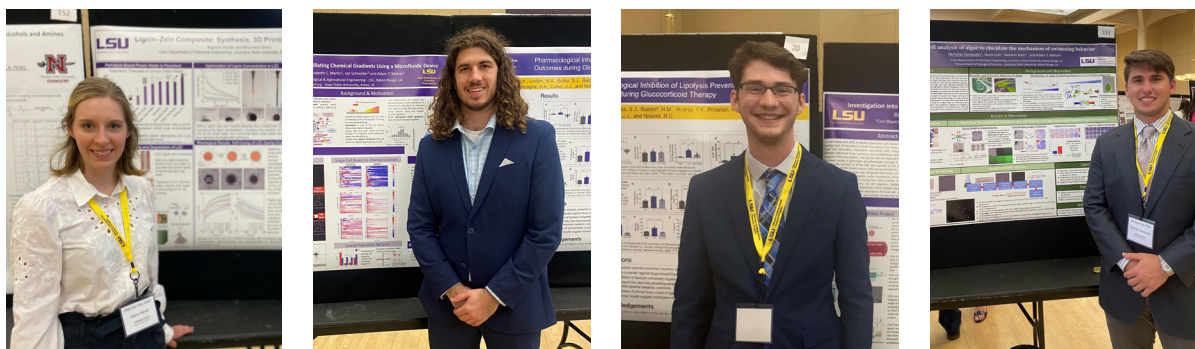


Trevor Thrasher

-Awarded Outstanding Thesis in Math, Physical Sciences, and Engineering



LSU Discover Day 2022



Four ChE undergraduates won prizes at LSU's 2022 Discover Day. Aubry Hymel was the overall third place finisher and received a plaque honoring her achievement. Blake Nassar, Trevor Thrasher, Nicholas Gonsoulin, and Aubry Hymel won \$50 for placing in the top 10 engineering posters.

Graduate Students Receive 2022 Kokes Award



Four of our PhD candidates - Divakar Aireddy (advised by Professor Kunlun Ding), Kazi Aurnob (advised by Professor James Spivey), Cameron Roman (advised by Professor James Dorman), and Bernard Whajah (co-advised by Profs. Dorman and Kerry Dooley) - received a 2022 Kokes Award at the 27th North American Catalysis Society meeting in New York, New York, held on May 22-27,

2022. The Richard J. Kokes Travel Award program of NACS aims to encourage undergraduate and graduate students to attend and participate in this biennial conference. The award provides funding to waive recipients conference registration fees and includes accommodations at the Hilton Midtown New York.

Glass Wins Best Presenter at Rice Undergraduate Symposium

LSU Chemical Engineering senior Sarah Glass was honored this past academic year with the Best Presenter award at the Rice University Gulf Coast Undergraduate Research Symposium.

The Algonquin, Illinois-native delivered a 15-minute presentation titled, On-Site H₂O₂ Generation for Water Reuse Treatment Systems, displaying research she conducted with LSU Chemical Engineering Professor Kevin McPeak. It was her first time attending and presenting at the symposium.

“This project focuses on the use of a titanium dioxide and gold nanoparticle heterojunction to generate hydrogen peroxide for use in a water reuse treatment plant,” Glass said. “In a water reuse process, H₂O₂ is often added in batch. Since this can be expensive, we instead utilize the nanoparticle heterojunction and UV light to generate H₂O₂ on site, lowering direct costs.”

Glass graduated LSU in May 2022 and is now attending Rice University as a doctoral candidate in environmental engineering.



“Right now, I am motivated to make a career in research and academia,” she said. “I am passionate about water usage within the U.S. and internationally because access to clean, usable water is an issue in communities worldwide. I am excited to see what the future holds for me, and I hope to make an impact in an area in dire need of solutions.”

McFeaters wins Bourke Award at Sugar Industry Technologists Conference

Eleanor McFeaters attended the 2022 Sugar Industry Technologists Conference this past April on behalf of her company concerning process simulation software and the future of digital twins in the sugar industry. She won the Bourke Award for best paper and met many alumni of the LSU Chemical Engineering program who came from all over the world.





AIChE Student and Faculty Awards Banquet

On the evening of May 5, 2022, the department hosted its annual American Institute of Chemical Engineers (AIChE) Awards Banquet. At this event, students and faculty were recognized for their academic and professional achievements.

The Chair's Award

This award recognizes students who complete their ChE curriculum in four years (eight semesters) without receiving a single "W" grade. This means that the students receiving this award completed every course in which they were enrolled for more than 10 days, an outstanding achievement as less than 25% of all students in our curriculum can make this claim. Students earning this award receive a certificate of their achievement. This year's recipients were:

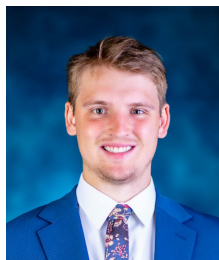
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Noah M. Smith
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Kailyn Carnaggio
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Taylor Elise Kelley
Jarod David Larriviere
Suzannah Mahoney
Carson Hunter McBroom
Cole Michael McCullough
Leah Potylchansky
Victor Fernando Rodriguez-Ortiz
Morgan Starkey
Haleigh Lynne Stevens
Trevor Roman Thrasher
Robert Cleve Wight, III
Rebekah Grace Wood
Nathan P. Zeringue

The David M. Wetzel Award

This award recognizes the most outstanding female sophomore as voted on by a faculty panel. The recipient receives a \$500 cash prize (in the fall semester), a trophy, and her name emblazoned on a plaque with past recipients. This year's recipient was **Caliah Ja'Nae Guillory**.

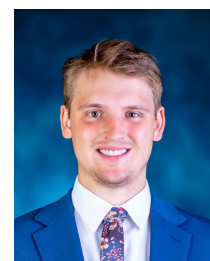
The Gautreaux Chemical Engineering Award

This award recognizes the junior who had the highest GPA after completing 90 credit hours. This year we had two recipients, **Joseph E. LaHaye** (fall semester graduate) and **Trevor Roman Thrasher** (spring semester graduate). They each received a \$250 cash prize, a certificate recognizing their accomplishment, and will have their names emblazoned on a plaque with past recipients.



The American Institute of Chemists Award

This award recognizes a student who has been an outstanding leader in the academic, professional, and community realms. This year's recipient was **Joseph E. LaHaye**. He will receive a certificate from the American Institute of Chemists, a one-year Student Associate membership in AIC, and a subscription to the AIC online journal.



The Jesse Coates Award

This award recognizes the student who the ChE faculty believe represents what LSU Chemical Engineering aspires its students to be—outstanding students, outstanding professionals, and outstanding community leaders. The recipient receives an engraved watch, a certificate recognizing his or her achievement, and his or her name emblazoned on a plaque with past recipients. This year's recipient was Olivia Elise Arcemont.



Dow Excellence in Teaching Award

Each year, seniors who will graduate in the spring and fall semesters vote on the faculty member who they believed was the most outstanding teacher they had during their matriculation in the ChE curriculum. The finalists for the award this year were Professors Mike Benton, Bhuvnesh Bharti, and Adam Melvin. By a very close margin, **Professor Melvin** took home the award. All the recipients received a trophy, and the winner received a cash prize.

ChE Scholarship Recipients 2020-2021

Alan M. Raymond Endowed Scholarship

Nicole Nguyen

ChE General Scholarship

Colin Herasymiuk

Clara & Frank R. Groves Engineering Scholarship

Daniel Zakharov

David Mongrue Chemical Engineering Scholarship

Olivia Arcemont

Eugene R. Cox Scholarship

Carson McBroom

Gene Purdue Lowe Scholarship

Emma Durnin

Kyle Elee

Tyler Faucheux

Matthew Fink

Brady Jacob

Colin McGlynn

Griffin Sanders

Gerard Family Undergraduate Scholarship

Ololade Adeola

Jacob Colvin

Kathryn Dunphy

Rachel Dupuy

Cole McCullough

Blake Nassar

Nathan Penalber

Leo C. Comeaux Chemical Engineering Scholarship

Kyle Elee

Quinn Morvant

O. Dewitt Duncan Jr. Endowed Scholarship

Christopher Ferrier

Marian Luzier

Suzannah Mahoney

Trevor Thrasher

Hongyu Yi

Paul M. Horton Memorial Undergraduate Scholarship

Bryon Hansley

Atif Iqbal

Paul Howell Endowed Memorial Scholarship

Giuse Nguyen

Ram N. Bhatia Scholarship

Christopher Ferrier

Ryan D. Fontenot Scholarship

Maggie Carrier

Walter G. Middleton Jr. Endowed Scholarship

Jacquelyn Dawson

Atif Iqbal

William E. McFatter Endowed Scholarship

Andy Nam

Caleb Voelkel

COMMENCEMENT



2021-2022 Chemical Engineering Graduates

August 2021

PhD

Subarna Kole
Gokul Venugopalan

MS

Hiba Malik

BS

Britain Renee Saunier

December 2021

PhD

MD Ashrafal Abedin
Natalia de Silva Moura
Venkata Sai Krishna Vutukur

MS

Aaron Craig Harrison

BS

Olivia Elise Arcemont
David Joaquin Balaguer
Hunter Bates
Samuel Batten
Erica M. Bickham
Noah R. Burns
Jacob S. Carden
Kayla Marie Carey
Benjamin James Clement
Rebecca Kay Degeneres
Dillon Deshotel
Ana Lucia Escobar
Darrell Harry
Natalie Hughes
Tyler Simone Johnson

Joseph E. LaHaye
Brennan Paul Lovell
Dawson A. McCulloch
Mason Joseph Miranda
Lauren Elizabeth Mistic
Anne-Marie C. Montelepre
Bryce Robert Moravec
Regan A. Newsom
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Devin Nguyen
Kevin Minhduy Nguyen
Phihan Philip Nguyen
Meghan Elizabeth Paulsen
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Nicole Ravey
Kevin M. Ridgley, Jr.
Griffin Andrew Rose
Jonathan Lawrence Ross
Austin J. Saizan
Noah M. Smith
Paige Nichole Tibbetts
Peter Khoa Vu

May 2022

PhD

Suman Bhasker Ranganath
Matthew Leo Jordan
Yingzhen Ma

MS

Yada Chulakham
Jordan Robert Ryan
Jingya Xiao

BS

Ololade Adeola





Ikil Said Saleh Alrawahi
 Noah Bradley Armbruster
 Jude P. Aucoin
 Abigail Batten
 Anna Bearden
 Brianna Belliveau
 Taylor B. Bendeck
 Madysen Ann Blattel
 Janice Alyse Bourgeois
 Sydney Bradley
 Brennen John Brazan
 Kailyn Carnaggio
 Evan Bauer Casper
 John Ho Cheng
 Tristan Wallace Dorgan
 Christopher Q. Ferrier
 Nicholas Scott Fontenot
 Adam Joseph Galliano
 Sarah K. Glass
 Nicholas Gerald Gonsoulin
 Brennan M. Hagan
 Catherine M. Harper
 Terra Harris
 Elizabeth Harrison
 Taylor Elise Kelley
 Jarod David Larriviere
 Suzannah Mahoney
 Carson Hunter McBroom
 Cole Michael McCullough
 Eleanor Julia McFeaters
 Alex P. Miller
 Jorge Luis Moretti
 Leah Potylchansky
 Victor F. Rodriguez-Ortiz
 Morgan Edwards Starkey
 Haleigh Lynne Stevens
 Trevor Roman Thrasher
 John Michael Tooraen
 Noah D. Walther
 Robert Cleve Wight, III
 Alexander Meyer Williams
 Rebekah Grace Wood
 Nathan P. Zeringue

Fall 2021 Latin Honors

Olivia Elise Arcemont
 – *Summa Cum Laude*

Joseph E. LaHaye
 – *Summa Cum Laude*

Noah M. Smith
 – *Summa Cum Laude*

Samuel Batten
 – *Magna Cum Laude*

Spring 2022 Latin Honors

Trevor Roman Thrasher
 – *Summa Cum Laude*

Kailyn Carnaggio
 – *Magna Cum Laude*

Suzannah Mahoney
 – *Magna Cum Laude*

Nathan Zeringue
 – *Magna Cum Laude*

Christopher Q. Ferrier
 – *Cum Laude*

Brennan M. Hagan
 – *Cum Laude*

Leah Potylchansky
 – *Cum Laude*

Thank You!

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