

Donation from retired Cryovac executive breaks record for ChBE



A retired Greenville executive recently provided the largest donation in history to the Chemical and Biomolecular engineering department. **Alumnus William Sturgis and his wife, Martha Beth, contributed \$600,000 to create a distinguished professorship in the department.** They plan to double their contribution in their will.

In a 37-year career, Sturgis served as executive vice president of worldwide packaging operations at W.R. Grace and president of its North American Cryovac Division. Upon his retirement in 1997, Sturgis received the Order of the Palmetto, the state's highest honor, and a commendation from the state House of Representatives. He and his wife stayed in Greenville after his retirement. With their donation, William and Martha Beth Sturgis are creating a distinguished professorship for ChBE. A faculty member who is selected for the professorship will be able to use funds generated by the endowment to support graduate and undergraduate students as they do research, learn about entrepreneurship and travel to national meetings, where they can present their research

to leaders in their field. An announcement on which faculty member will receive the professorship is expected soon. Sturgis (ChE Class of 1957) said he and his wife established the professorship because they wanted to do something for chemical engineering at Clemson, where he got his start studying under influential professor Charles E. Littlejohn Jr. David Bruce, chair of the department, said it is important to bring in great faculty who will inspire students. The Sturgis contribution "will let us retain great faculty that we already have and be a beacon to bring in new faculty to the department," Bruce said.

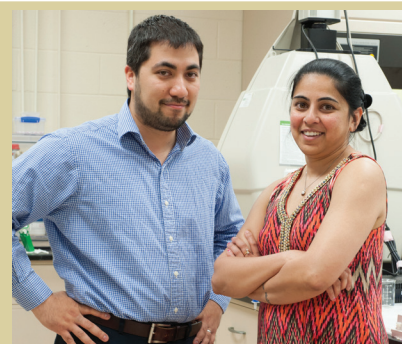
The Department of Chemical and Biomolecular Engineering would like to thank William and Martha Beth Sturgis for their immense generosity and innovative thinking.

(For more details, please go to: <http://newsstand.clemson.edu/mediarelations/donation-from-retired-cryovac-executive-breaks-record-for-clemson-chemical-engineering/>)

Dr. Blenner & Dr. Sarupria Receive Tenure

The ChBE Department would like to congratulate Dr. Mark Blenner and Dr. Sapna Sarupria, who have both received Tenure and been promoted to Associate Professor.

The Blenner Research Group uses biotechnology to solve pressing challenges in sustainable production of chemicals, nutraceuticals, biopharmaceuticals, and biological sensors. Ph.D. and undergraduate students in the group have worked on problems of importance to basic scientific knowledge, as well as various stakeholders at the Department of Defense and NASA, and to the biotech and rendering industries. In addition to teaching students to be critical thinkers through research, Dr. Blenner has taught upper level courses in reaction engineering, mass transfer and separations, and biomolecular engineering. Receiving tenure is an honor that will allow him to add a new focus on mammalian cell biomanufacturing, and allow him to contribute more to departmental leadership.



Sarupria's group uses and develops computational tools to study a broad range of materials and phenomena that impact industries ranging from water purification to commercial aviation. The Sarupria group uses molecular dynamics simulations to study proteins, polymers and water at interfaces. In addition, the research group develops and uses advanced sampling techniques to study processes that are beyond the reach of straightforward molecular dynamics simulations. Using such techniques, they are studying heterogeneous ice and hydrate nucleation. Other research projects include the development of advanced sampling methods and software, multiscale modeling of fouling on water filtration membranes, and enzyme immobilization on polymer membranes. Dr. Sarupria teaches molecular modeling and statistical thermodynamics to graduate students and thermodynamics to undergraduate students.

ALUMNI SPOTLIGHT

Kavitha Ganesan Arms Wins Outstanding Young Alumni Award



ChBE alumna, Kavitha Ganesan Arms (ChE 2001), received the Outstanding Young Alumni Award at the Thomas Green Clemson Academy Banquet in April. She was selected by a review committee made up of senior faculty members, alumni, and college advisory board members. The Outstanding Young Alumni Award honors a College of Engineering, Computing, and Applied Sciences graduate, age 40 or younger, whose achievements have been significant to the field, their profession, or the welfare of society.

After completing both her Bachelor of Science in chemical engineering and master's in bioengineering at Clemson University, Arms joined GE Energy in 2005 as a product safety engineer. Her accomplishments and expertise prompted her promotion to the technical lead position over Human Factors Engineering at GE's Power and Water Facility and a later promotion to Executive Engineering Manager of Enterprise Risk Management and External Affairs at the same facility, where she oversaw all safety aspects related to anything developed on site. GE's state-of-the-art Power and Water Advanced Manufacturing Facility in Greenville, SC houses the world's largest gas turbine manufacturing facility and rapid prototyping for water processing, wind turbines, power gas engines, and nuclear power services. Due to the massive scale and potential hazards at the site, Arms' job was imperative in ensuring that the engineering designs were safe for employees and the public. This year, Arms accepted her new position as EHS Manager of Chemical and Product Stewardship. During her career with GE, Arms' safety initiatives have led to over a 60 percent decrease in unsafe events in labs and testing facilities and major improvements to the company's overall safety culture.

In addition to her work with GE, Arms continues to give back to Clemson by serving on the Department of Chemical and Biomolecular Engineering Professional Advisory Board and assisting with the student chapter of the Society of Women Engineers. The Department of Chemical and Biomolecular Engineering would like to thank Kavitha Arms for her continued support and congratulate her on this well deserved award.

FACULTY HIGHLIGHTS

Dr. Husson's Proposal Selected for Stimulus Research Program

Of the 29 proposals submitted to SC EPSCoR (Established Program to Stimulate Competitive Research), Dr. Scott Husson's was among the four that were selected as recipients of the Stimulus Research Program. His submission, titled "Anaerobic membrane bioreactors as a next-generation technology to address the food-energy-water nexus," addresses some of the key challenges of establishing anaerobic membrane bioreactors (AnMBRs) as a next generation municipal wastewater treatment platform for water reuse as well as energy harvesting and nutrient recovery. The proposal is designed to prove feasibility of the novel concepts that the Husson team has devised to address key challenges that our society faces at the food-energy-water nexus. The project objectives align very closely with three industry focus areas highlighted in the South Carolina Vision 2025: energy, environment, and sustainability.



Professors Rachel Getman and Sapna Sarupria were honored by the Board of Trustees for their accomplishments over this past year. Each received the Award of Excellence, which honors the highest level of scholastic or professional achievement at the national and international level.

MESSAGE FROM THE CHAIR

Dear Alumni and Friends,

Greetings from the Chemical and Biomolecular Engineering Department at Clemson University. The start of fall is an exciting time at Clemson. The university is a buzz with new and returning students, and the excitement extends to more than just athletics. This fall brings the department a record number of students in the senior class (88 seniors) and graduate program (58 PhD and 5 MS). It also brings to a close one of the most memorable and eventful years in the history of the department. We celebrated 100 Years of Chemical Engineering at Clemson, held the inaugural Dan Edie Endowed Lectureship, had two outstanding faculty receive tenure and promotion (Mark Blenner and Sapna Sarupria), recruited two excellent new faculty to the department (Marc Birtwistle and Jessica Larsen), were blessed by multiple generous gifts from our exceptional alumni, and continued to graduate some of the best chemical engineering students. We are also on track for this to be another great year for the department.

I want to say a special thank you to those alumni who helped support the department this past academic year with their time and gifts. Through the generous donations of Bill ('57) and Martha Beth Sturgis, we were able to establish a new endowed professorship in Chemical Engineering that will recognize a leader in chemical engineering education and research. The ChBE Class of 1963 also created a new endowment that will support the educational mission of the department, and this donation is made even more special by the fact that these alumni routinely visit and are constantly finding new ways of giving back to the department. One of our former faculty, interim department chair, and associate dean, Dr. Steve Melsheimer, along with his wife Patsy, decided to pay it forward by creating a two-year undergraduate scholarship for a worthy outstanding junior in ChBE that is to be awarded each fall. To make sure that the graduate program in ChBE was not forgotten, Silas and Sophia Wong, two of our alumni living overseas, wanted to recognize Dr. Mark Thies and his influence on Clemson ChBE students by creating a graduate fellowship that will help recruit some of the world's brightest minds to our doctoral research program. Finally, I want to acknowledge all of the alumni who took time from their busy schedules to come back to Clemson to educate, inspire and evaluate the hard work of our students, as well as advise and collaborate with the faculty and chair about many of our departmental efforts.

The success of our department this past academic year is clearly evident by the quality of our graduates as well as the recognition and accolades received by our outstanding faculty. I encourage you to read further and learn about some of these exciting accomplishments. I also look forward to creating many new opportunities to involve our alumni in the education of the next generation of Clemson chemical engineers – we too can be All In!

Best Wishes and Go Tigers!

David Bruce



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ALUMNI GIVING - NEW ENDOWMENTS

“Leaving a Legacy” - The Class of 1963 Endowment



Standing in front of Earle Hall on May 20, 2011, were (left to right) Wade Ponder, Al Tolson, Jim Rushton, Cliff Hattaway, John Cromer, Jerry Richardson, and John Elsey. Attending but not available for this picture were Larry Murdoch, Terry Kinard, and Dr. Barlage.

In May 2011, the **Class of 1963** ventured back to the hallways of Earle Hall for a class reunion. At that time, some of them hadn't been here since graduation day - 48 years earlier. This first reunion rekindled past friendships and stirred up plenty of memories of their days here at Clemson, and their hard work in Earle Hall. Since 2011, they have tried to come back every year, along with their wives, in order to keep in touch with each other and what is going on in the department. Now 55 years after their graduation day, experiencing successful careers, and raising wonderful families, they now have taken time to reflect on how it all started. They now want to leave an imprint of their footsteps for others to follow and make

an impact on future Chemical and Biomolecular Engineering students' lives. They want to **Leave a Legacy** with their new **Class of 1963 Endowment**. They have pooled their resources and created a scholarship that will help enhance the educational programs in the department. Here are excerpts of their stories and their careers, as they reflect on what inspired them to create this new endowment . . .

James Rushton “Most of my classmates and I came from small towns and farms, and without our opportunity to attend Clemson, our lives would be much less interesting and successful. I grew up under the influence of Greenwood's textile mills, and without my ChE degree, would most likely have ended up as a “lint head” working in a textile mill. Thank God for Clemson!” Rushton worked at a paper company in Brevard NC several years after graduation until landing a job at J.E. Serrine in Greenville SC. After 13 years and taking many graduate courses, he decided to go for his PhD in 1976, pursuing his interest in pulp and paper processes. He moved his wife, Judi, and their three small children to Moscow, Idaho, so he could attend the University of Idaho, under the tutelage of Dr. Lou Edwards, the creator of the GEMS pulp and paper simulation program. He finished his Master of Engineering degree in Chemical Engineering at Clemson, while pursuing his PhD in Idaho. After graduation, he joined the Georgia Pacific Corporation as corporate leader of process simulation and spearheaded the use of process simulation as a means to design and optimize pulp and paper processes, teaching and creating simulation models at GP mills across the U.S. After retiring in 2003, Jim created a consulting business, Cambridge Oaks Inc., and continues to serve as a Process Simulation Consultant for the pulp and paper industry.

Wade Ponder “My family could not afford tuition and a dorm room, but my Father (who only completed 8th grade) said if I really wanted to go, I could commute. So I drove six days a week or 34,000 miles for my Bachelor's degree. I also helped with expenses by driving an ice cream truck in the summer months. After I earned my Bachelor's Degree in 1963, I got married, and my wife and I moved to Clemson so that I could work on my Master's degree in Chemical Engineering, which I received in January 1965. I participated in funding the endowment to the Chemical and Biomolecular Department at Clemson University because of the successes I have had as a result of the dedication and service of the professors in that department. They prepared me for a career that turned out to be beyond my fondest dreams. To me, it is just a way to say “Thank You” for what the department prepared me to accomplish.” After earning his degrees at Clemson, Wade Ponder's work experiences included teaching chemistry, working for a petroleum company, and working 36 years for the U.S. Environmental Protection Agency, which provided opportunities to work with other engineers in England, France, Germany, Poland, and Brazil. He was one of a team of five chemical engineers at the U.S. EPA who developed, demonstrated, and commercialized flue gas desulfurization technology, that is now used worldwide to remove sulfur dioxide, particulate matter, and other pollutants from power plant emissions. Later, he served as a Branch Chief at EPA and as an Assistant to the EPA Administrator for Research and Development in Washington DC.

Lawrence Murdoch “My choice of chemical engineering and Clemson has provided me excellent opportunities throughout my career. The department was recognized for its quality, which was a result of the dedication of Dr. Littlejohn and the entire faculty. For this reason, I wish to repay the department and help in maintaining the quality and reputation that continues to exist. Because of Dr. Littlejohn's excellent reputation and contacts, I received several offers to continue graduate studies. As a result, I attended Iowa State University and was well prepared for my studies and for receiving my MS in Chemical Engineering. Even though much of my career was in management, the chemical engineering knowledge, discipline, and work ethic developed during my Chemical Engineering education at Clemson was key to my success.” Larry Murdoch was employed for 50 years, starting in chemical plant production, and soon thereafter moved to the engineering and construction industry. During this period, the varied industries served and the global range of his responsibilities always brought interesting and challenging opportunities.



Class of 1963 on a Field Trip to Olin-Mathieson Chemical Company in Brevard, North Carolina. Front Row (left to right): Dr. W.B. Barlage, T.R. Kinard, A.D. Tolson, J.M. Clark, J. D. Rushton, W.H. Ponder, J.M. Harmon, L.B. Murdoch. Back Row (left to right): D.B. Watt, J.M. Brown, J.A. Goodson, J.B. Webster, J.N. Cromer, ?, W.H. Chelf, C.T. Hattaway, C.G. Hayes, C.H. Caban, G.F. Ruehling. Absent: J. I. Elsey, J.G. Richardson.

Jerry Richardson “Chemical engineering was hard- very hard. Chemical engineering taught us to think for ourselves. It taught us to face any problems with the total confidence that we could solve them. I worked mostly in the polyester film industry, so I never did classical chemical engineering. Instead I worked on advanced technology to make ultra-thin films, which went into a variety of industrial uses. The work I am most proud of was working on a team to develop a computerized film thickness system to automatically control the thickness profile of thin films to very tight tolerances. It was the first industrial use of computers according to Hewlett Packard. I received a US patent for that work 46 years ago. My degree afforded me the luxury of meeting and working with and becoming friends with some of the most intelligent engineers in the USA, Germany, and Japan. The most important thing that my Clemson experience did for me is what it is doing for me now - Chemical engineering gave me a great gift - “the love of learning.” I retired at age 58. That was 21 years ago. I have spent the past years, giving away most of what I earned, learning many new things, and putting my new knowledge to work. I started three new careers and two companies since retiring. To paraphrase another one of my classmates, I am extremely grateful for what Clemson has done for me. They made me what I am today and is why I give to Clemson. My choice of chemical engineering and Clemson has provided excellent opportunities throughout my career.”



Dr. Barlage and John Elsey in 2011

John Cromer “I also have benefited personally and financially from my Chemical Engineering degree from Clemson. My career has afforded me the opportunity to interact with many extraordinary individuals, many of them engineers. The one goal we all shared was to solve or eliminate problems that came our way. During the last few years, several of us from the ChE class of '63 have been returning to Clemson each spring for a reunion. I have taken two wonderful revelations from those reunions: My '63 classmates stand high on my list of extraordinary people. The list now includes many more of the Clemson Family, especially the ChBE Department staff. I never thought much about a Clemson ChE Class of '63 legacy. Last year at our reunion, the group did what we do best, problem solve. We proudly came together to agree on our class legacy and establish an Endowment. In closing I would appeal to all Clemson Alumni to consider establishing similar class Endowments to cement their Clemson Legacy, which lives on long after we're gone. It's a great way to give back to the institution that has contributed so much to who we are.”

Cliff Hattaway “I never had a problem obtaining a worthy job with an Engineering degree from Clemson. Back in 1963, I was one of the first ChEs to be offered a job with Gulf Oil in Port Arthur, Texas, prior to entering the Army. Later, it didn't hurt to have been a Captain in the US Army back in the sixties. I retired from Phillips 66 back in 1994, where I had several different jobs. Besides receiving my Chemical Engineering degree in 1963, I also received a masters in business from the University of Virginia. Basically my employers always figured that a ChE could do anything from Marketing and Engineering to Financial Accounting.”

Alfred Tolson “My Clemson Chemical Engineering Degree first earned me a job. I had five (5) job offers upon graduation. When I started working, I found I was well prepared for the transition to the real world of chemical manufacturing. There was solid knowledge of chemical engineering principles plus practical skills that had resulted from the Unit Operations Laboratory, Plant Design, a Senior Thesis Project, and Senior Seminar experience. My professional career was spent with one company, Tennessee Eastman Company, later Eastman Chemical Company (with a two-year interruption for military duty.) I basically worked up through the ranks in a manufacturing division as an individual contributor, area supervisor, group leader, development section head, to department superintendent of three (3) different departments: one development and support and two manufacturing. There were also a few staff assignments sprinkled in along the way. I did get my Professional Engineers License, which we were encouraged to do at Clemson. Some of our class started gathering annually at Clemson for a few days about six years ago. We were impressed with the welcome and attention we received from the Department. Along the way, realizing what our degrees had meant to us in our careers, someone in the group suggested that we do something to give back to the Department. That something, with the help of the Clemson Staff, became the **Chemical Engineering Class of 1963 Endowment**. I suggest to all other classes to reconnect with the Department and maybe be inspired to find a way to give back.”



Back at Earle Hall in 2016: John Cromer, Wade Ponder, Al Tolson, Jerry Richardson, Jim Rushton, and Larry Murdoch

Enoch (Chip) Hurst “My ChE degree opened the door into a much wider world, totally different from my agrarian upbringing. I started Clemson with the class of '63, but was withdrawn for a year to serve in my National Guard unit because of the Berlin Wall military deployment in 1961-62. While I returned and graduated with the class of '64, I have always returned to join the more active class of '63 at reunions. I did eventually get a masters degree in finance from UNC-Charlotte and a Professional Engineering Certificate. I worked in industrial settings for 32 years and retired at age 56 from Bridgestone-Firestone at the same time as my French-teacher wife. My wife and I sold the house, gave our possessions to our three children, and backpacked around the world for 5 years. We settled in Florida, where I taught math online for awhile, and now I am writing my first book. I am currently in my 79th year and expect to publish 3 non-fiction books this summer. My wife and I cruise a few times a year with friends, and I am scheduled to play tennis and golf six times a week if it is not raining. We spend three to four weeks a year with our three kids (all are Clemson grads) and six grandkids (future Clemson grads). **We are living the dream!”**



Touring CU-ICAR in 2017: Wade Ponder, Jerry Richardson, and Jim Rushton.

ALUMNI GIVING - NEW ENDOWMENTS

“Paying it Forward” - Dr. Stephen and Patricia Melsheimer Endowment



Dr. Steve and Patsy Melsheimer

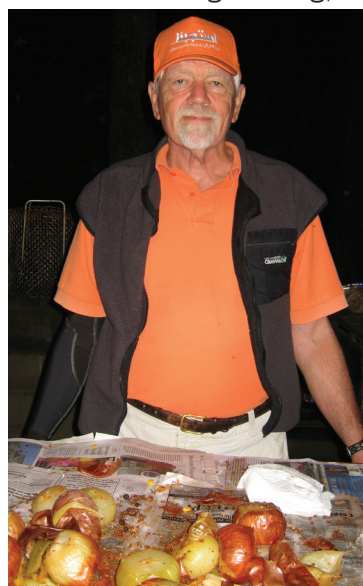
In 1961, Dr. Stephen Melsheimer started his academic career as a Chemistry major at Louisiana State University in Baton Rouge, Louisiana. However, the Chemistry curriculum did not motivate him, and his grades began to suffer. After his fall sophomore term, Dr. Melsheimer decided to give Chemical Engineering a try and switched his major. It was there in Chemical Engineering that he met his mentor, a professor by the name of Dr. Dale von Rosenberg, who taught the equivalent of ChBE 2110 – Mass and Energy Balances. Dr. von Rosenberg had a rather gruff, caustic manner and was a rigorous grader. As LSU had an “open door” admissions policy, and the first ChBE course is always a challenge, many sophomore ChE students (nearly 50%!) would fail or drop. However, he was very interested in his students, especially those who worked hard. This inspired Dr. Melsheimer, who earned an “A” and his subsequent GPR took a significant turn for the better. He took the balance of his sophomore ChE classes in summer school and caught up with his peers as a junior in ChE. After another successful term in his Fall junior term, he received a \$250 scholarship (big

money in those days!) This scholarship was a big relief, as LSU tuition at that time was \$76 per semester and his dorm cost only about \$120. Interestingly, his dorm room was located under LSU’s Tiger Stadium, and directly adjacent to LSU’s ChemE building. This scholarship made a world of difference and helped lay the foundation for Dr. Melsheimer’s future career. After receiving his Bachelors in Chemical Engineering in 1965, he decided to pursue a PhD – and, followed his mentor, Dr. von Rosenberg, who had moved on to Tulane University.

After completing his doctorate, he interviewed for a faculty position at Clemson, and was delighted to accept the position of Assistant Professor when offered by Professor C.E. Littlejohn. He and his beautiful wife Patsy, who he met when they were high school seniors in his hometown (Plaquemine, La), moved to Clemson in January, 1969 – a bitterly cold winter, especially for South Louisiana natives! Patsy recalls wondering what her husband had gotten her into! Thus, began the building of his career as well as their family here at Clemson. Needless to say, he and Patsy quickly fell in love with Clemson, and in short order their family had expanded to include three daughters – Gretchen, Wendi and Kirsten.

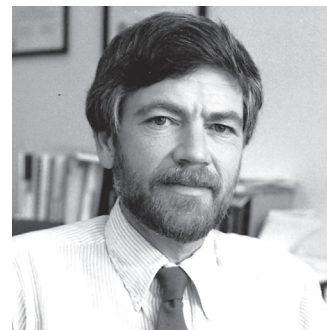
Dr. Melsheimer’s first semester teaching included a Unit Ops lecture class (two sections!) plus an Analog Computing Lab (4 sections!). Over the next few years he taught almost every undergraduate course, and began his research career, focusing on process control and membrane separations. He was promoted to full Professor in 1975. During his tenure in Chemical Engineering, Dr. Melsheimer was the advisor for our AIChE student chapter from 1973 to 1978. He started

the Shrimp Boil in 1971, still an annual tradition for our AIChE chapter. And you can still see him at our current Shrimp Boils, ensuring that everything is cooked to perfection. His professional duties included serving as Clemson’s Faculty Senate President (1981-82), chairing the university SACS accreditation review committee (1989-91), and numerous other college, university and professional assignments. His research and professional activities led to over 27 publications and numerous presentations. He served as the Interim Department Chair from 1986 through 1987. Then, in 1993, he was promoted to Associate Dean of Undergraduate Studies for the College. As Associate Dean, he had a special focus on international programs for engineering students, and was instrumental in setting up Chemical Engineering’s Vienna, Austria, summer study abroad program. He was also instrumental in creating the College’s EPIC International Co-Op program and numerous study abroad opportunities including the summer study abroad program in Trier, Germany. The study abroad opportunities for our ChBE students continue today, notably including a summer program in Denmark. Dr. Melsheimer continued to serve as Associate Dean for the College until his retirement in 2008.



Because the scholarship he received as an undergraduate at LSU made such an impact on his life, his career, and his family, Dr. Melsheimer and his wife Patricia want to **Pay it Forward**. They have recently established **The Stephen and Patricia Melsheimer Endowment**.

Their endowment will provide a scholarship to a worthy top rising junior, with a possibility of a renewal during their senior year. The goal of this scholarship is to recognize, reward, and encourage the student’s success by relieving them of the financial burden of their tuition, so they can concentrate on their classes and their future.



“Giving Back” - Silas and Sofia Wong - The Dr. Mark Thies Fellowship Endowment



Silas and Sofia Wong hiking with Dr. Mark Thies and Evan Thies in Alaska in 2014, along with their son Julian and a friend. (Not pictured are the Wong's other two children - Alex and Claudia).

Silas and Sofia Wong both received their B.S. degrees in Chemical Engineering at Clemson University in 1995 and 1994, respectively. They met during the beginning of their undergraduate studies at McGill University in Montreal, Canada. Silas received his B.S. in Biology at McGill in 1990, and Sofia was two years behind him. Silas acquired a job in South Carolina after his graduation from McGill, and he and Sofia got married. Two years after Sofia started at Clemson as a transfer student, Silas decided to join her to get his second B.S. degree in Chemical Engineering. They were both very grateful for the loans and grants which allowed them to be in school at the same time.

While obtaining their B.S. degrees at Clemson, Silas and Sofia came across several professors who impacted their lives, including Dr. Charles Barron, Dr. Doug Hirt, Dr. Charles Gooding, Dr. Amod Ogale and Dr. Bud Rice. However, the one they owe a lot of what they are today to is Dr. Mark Thies. While at Clemson, Dr. Thies was a hard, demanding teacher who emphasized quality, accuracy, and safety. Dr. Thies made sure you knew your material in class and in practice. He would often say, “teachers don’t

fail you, you fail yourself.” This demand for quality and accuracy carries through to their careers today.

Sofia and Silas started out with Occidental Chemical, which eventually lead them to the Houston area. Once in Houston, Sofia moved to Exxon in 1997, while Silas started working with a Shell Oil subsidiary. Silas then worked with Grace in their Catalysis Division, and he is now a contract employee as they follow Sofia’s many moves with ExxonMobil. Sofia is presently the General Manager of the Nigeria Projects Organization in Lagos. She is primarily responsible for restoring the integrity of aging facilities, and developing new offshore opportunities to increase oil production.

Prior to Nigeria, Exxon provided Silas and Sofia the opportunity to work and live in Alaska from 2009 through 2015, where they still consider home. They then returned to Houston for a year before moving to Singapore in 2016, and have been in Nigeria since early 2017. During this time, they managed to raise three wonderful children: Alex (21) is a senior chemical engineering student at Cornell University; Claudia (19) is a sophomore National Honors Scholar in the Bioengineering Department at Clemson; and Julian (11) is in Middle School in Lagos.

Their degrees from Clemson have provided Silas and Sofia the opportunity to live, work, and travel around the world. Realizing how important loans and grants were to their success in college and their careers, they want to **Give Back** to their alma mater and honor their mentor, Dr. Mark Thies. Therefore, they have created the **Dr. Mark Thies Fellowship Endowment** that will offer an academic scholarship to a deserving Graduate Student in the Department of Chemical and Biomolecular Engineering.

CLASS OF 1968 - 50th REUNION



Class of 1968 alums, Frank Cox and our very own Bud Rice, enjoyed the Golden Tiger 50th Class Reunion on campus in June. They participated in the many tours and events across campus.

HOMEcoming 2018

PLEASE SAVE THE DATE

The Department of Chemical and Biomolecular Engineering cordially invites all of our alumni and their families to our

Annual Homecoming Tailgate
Saturday, October 20, 2018
Earle Hall Patio

Starts Three Hours Before Kickoff
Food and Beverages Provided
Please RSVP Terri McAllister at
mcalli3@clemson.edu by 10/10/18

STUDENT HIGHLIGHTS

Students Found NOBCChE Chapter



ChBE undergraduate students Deidra Ward and Mikhalha Cooper founded Clemson's first chapter of the **National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE)**. The inaugural officers are: **Jasmine Pringle (Treasurer), De'Janique Bradshaw (Social Media), Deidra Ward (President), Mikhalha Cooper (Vice President), Johnathan O'Neil (Secretary), and Rashaun Rush (Campus Representative)**. NOBCChE will serve as a catalyst for networking, leadership development, professional development, and fellowship between black students studying chemistry, chemical engineering, and related fields. The Clemson chapter will also foster diversity and minority retention in those fields. The organization held their first general body meeting where they elected members of their executive board, highlighted the goals of the organization, and discussed membership benefits.



Kamryn Kant and Steven Hall worked this summer with the **Chemical Informatics Research Group** under the **Chemical Sciences Division of the Material Measurement Laboratory at NIST** in Maryland. Their research group developed a fast, accurate approach that combines biased Monte Carlo simulations with statistical mechanical theory to enable the calculation of thermodynamic properties of multicomponent fluids over a broad range of conditions. Kamryn's purpose was to run these calculations on generated data of binary fluid mixtures confined in prototypical nanoporous materials. He also was responsible for plotting, or otherwise presenting, these results in a systematic and thorough manner as they will be cataloged and stored for later distribution in a database. Steven Hall used the Monte Carlo simulations to test a new particle insertion and deletion method in the grand canonical ensemble that will allow more efficient sampling of ionic systems. This consists of simulating model systems, such as charged hard spheres, and calculating the phase equilibrium properties for comparison with literature, as well as determining the increase in efficiency compared to conventional particle insertion and deletion methods.

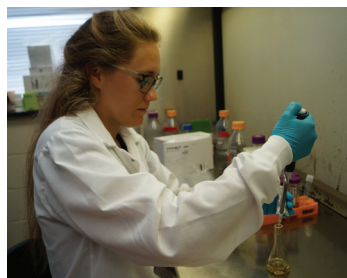
AICHE Conference



Clemson University's AIChE Student Chapter attended the 2018 Southern Regional AIChE Conference held at LSU in Baton Rouge, Louisiana.

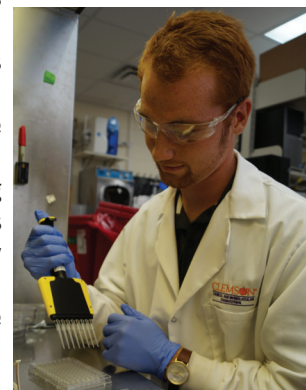


Conference attendees participated in plant tours and a career fair. Our chapter had teams represented in the conference's Jeopardy competition where they won the first round, and the ChemE Car competition. Members Adam Bietz and Camilo Cuescum presented research at the poster fair. Chapter president, Andrew Ney, represented Clemson at the President's Breakfast where he worked on getting the Clemson chapter paired with an international AIChE chapter as a part of the sister school program.

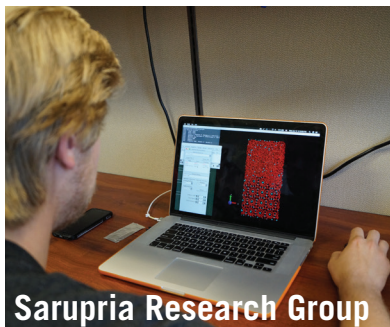


Undergraduates Meredith Bailey and Adam Beitz were awarded **SC Space Grant EPSCOR Fellowships** this summer. Working in Dr. Blenner's lab, they tested the impact of the PEX7, PEX11, and PEX16 genes in *Yarrowia lipolytica* on peroxisome size, number, and ability to produce

PHA. The three different PEX genes were knocked out and over expressed to test the necessity of the genes for proper peroxisome formation and function. *Y. lipolytica* readily accumulates lipids and is thus a promising microbe for bioproduction of lipid based chemicals, including products required for long term space travel such as Omega-3 fatty acids. They utilized the CRISPR Cas9 system to produce knockouts of every gene in the genome of *Y. lipolytica* to determine which genes are essential for metabolism and growth and which were nonessential. Additionally, they worked to determine which genes were essential for metabolism of alternative carbon sources as glucose, the main sugar used in bioprocessing, will not be available in large quantities for long term space travel. Their project is laying the foundation for future researchers to engineer *Y. lipolytica* to optimally produce Omega-3 fatty acids and other products to help enable astronauts to thrive during extended space exploration.

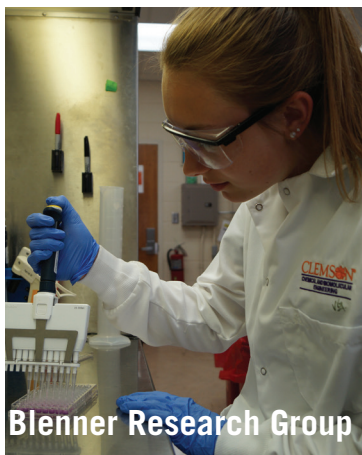


UNDERGRAD SUMMER RESEARCH 2018



Sarupria Research Group

The Sarupria Research Group used molecular simulations to study the assembly of materials, including liquid-to-solid transition in water and aqueous solutions. Undergraduate **Garrett Buchmann and Eliel Akinbami**, a Chemical Engineering senior visiting Dr. Sarupria's group from Howard University, used molecular dynamics simulations to study the effect of various additives on liquid-to-solid transitions in water. They studied additives such as amino acids. The goal is to develop an understanding of how additives can be used to control the self-assembly process.



Blenner Research Group

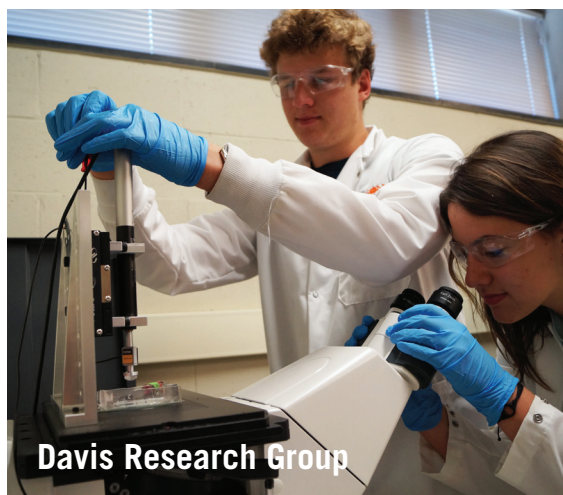


Kitchens Research Group



Thies Research Group

The Davis Group is happy to welcome four new undergraduate researchers to the lab: **Annalise Bowers, Alessandra Lee, Taylor McDaniel, and Jacob Steele**. Annalise and Jacob have undertaken a project investigating the effect of nanoparticles, with various surface chemistries, on network formation in a number of hydrogel membranes. These nanocomposite hydrogel membranes have shown promise in water purification technologies involving separation of water/oil emulsions and removal of heavy metal ions, to name a few. Under the guidance of graduate student Allison Jansto, Alessandra and Taylor are investigating the effect of various nanofillers on water and ion transport in ionomer membranes used in vanadium redox flow batteries. Finally, undergraduate **Ross Jasper** is working to deepen our understanding of water transport mechanisms in 3D printed glassy polymers, and how these differ from traditional, solution-cast polymer membranes.



Davis Research Group

The Husson Research Group has observed that an alcohol pretreatment on desalination membranes can lead to higher water production without using more power, but the exact role of the alcohol in this process is unknown. This summer, undergraduate **Michael Lemelin** researched this process by evaluating different desalination membranes to determine how much their water permeability and salt rejection changed after the pretreatment.



Husson Research Group



Larsen Research Group

The Larsen undergrad researchers, **Sara Edgecomb and Chris Rovero**, worked together with Blenner's group to encapsulate gene editing proteins into polymeric nanoparticles to ensure they are protected in the body and delivered into neurons as a treatment for genetic neurodegenerative disease. **Austin Evers and Cheyenne Brady** worked on a project in collaboration with Dr. Jeff Twiss at the University of South Carolina. Dr. Twiss has isolated the acidic domain of a protein G3BP1, which has been shown to promote nerve regeneration after injury. For this peptide to be the most successful, it needs to be able to get into the brain. Cheyenne and Austin are encapsulating this peptide into nanoparticles and will be traveling to USC to test the effect of this treatment on a cell line established in Dr. Twiss's lab. **Sarah Smith** is working with cells isolated from a feline model of a childhood neurodegenerative disorder, GM1 gangliosidosis. She is studying the time line of neurodegeneration and correlating this timeline with biomarkers of disease. Through this, she will be able to help develop new in vivo diagnostic tools for these elusive disorders.



Getman Research Group

Anish Chaluvadi, a Clemson undergraduate in Materials Science and Engineering (MSE) (working through an REU supplement from the SC MADE program) and **Max Norman**, an undergraduate at Furman University (working through the COMSET REU program), worked with the Getman Research Group on a computationally-driven project involving simulations integrated with experiments in collaboration with Dr. Thompson Mefford's group (Clemson MSE) aimed at learning how to design magnetic nanoparticles for maximum energy delivery by modulating their magnetic moments and anisotropies.

GRADUATION



Congratulations to the Senior Class of 2018!

The Department of Chemical and Biomolecular Engineering wishes all of our graduates the best of luck in their future endeavors.



Edwin Ball
Brice Barnett
Zander Barth
William Bowman
Gray Brewer
Tara Brooks
Christopher Brown
Cory Brown
Evan Broyles
Micheal Chulmecky
Daniel Cline
David Cuntapay
Cody Davidson
Jonathan Durham
Bethany Eaton
Tristen Fields
Eric Fierce
Jenna Foote
Michelle Gestring
Jedidiah Gist
Moses Hackett
Steven Hall
William Hardy
Alexander Herd

Waring Hills
Harrison Hix
Derek Holder
Cameron Jackson
Blake Jenkins
Taylor Johnson
Ashlee Jones
Issac Jones
Kamryn Kant
Tanner Karp
Courtney Law
Olivia Layman
Taylor Ledford
Weining Li
Jarret Londergan
Kelsey Miller
Sean Miller
Brandon Michell
Sean Nance
Alex Newton
Lindsay Noll
Kaelyn O'Neill
Kevin Peck

Crystal Pee
Andrew Perry
Sean Phillips
Josh Pifer
Marissa Ramos
Joseph Riggs
Shannon Roberson
Dillard Robertson
Andrew Samstag
Tanner Schodowski
Jonathan Shealy
Christian Sommerville
Joshua Sparks
Graham Tindall
Richard Turner
Kenny Vo
Sothea Vong
Steven Weaver
William Webb
Dylan Weber
Joseph Whitaker
Daniel Wile
Orrod Zadeh
Jessica Zahn



PhD Graduates



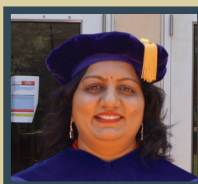
Dr. Jason Coral..... Advisor: Dr. Kitchens

Predicting Hydroxyl Radical Generation from Irradiated TiO₂ nanoparticles Under Simulated Environmental Conditions



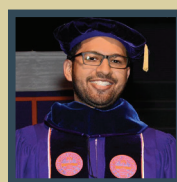
Dr. Brittany GlatzAdvisor: Dr. Sarupria

The Role of Surface Factors on Heterogeneous Ice Nucleation



Dr. Anuradha Gundamaraju... Advisor: Dr. Bruce

First Principles-Based Microkinetic Modeling of Ethanol from Syngas on Bimetallic Co-Pd Catalysts



Dr. Roque Gochez.....Advisor: Dr. Kitchens

Kinetic Modeling, reinforcement, and water stability enhancement of magnesium oxychloride cement for sustainable building applications

Sr. Engineer - Dow Chemical's Performance Silicones Division



Dr. Mingzhe Jiang.....Advisor: Dr. Kitchens

Effects of Surface Chemistry on Cellulose Nanocrystal Phase Behavior, Microstructure Self-Assembly and its Film Processing for Functional Composite Application

Engineer - Jet Products, Houston TX



Dr. Steven Weinman.....Advisor: Dr. Husson

Development of Anti-Fouling Membranes for Water Treatment

Assistant Professor, University of Alabama, Chemical and Biological Engineering Department

Masters Graduate



Bushra Rahman.....Advisor: Dr. Ogale

Mesophase Pitch Extrusion Flow Through Fiber Spinnerts

AWARDS

Departmental Awards

Western SC Section AIChE Scholarship
Achievement Award

Taylor Johnson

ChBE Senior of the Year

Andrew Samstag

Undergraduate Researcher of the Year

Steven Hall

Will Hardy (Honorable Mention Senior)

Adam Beitz (Honorable Mention Junior)

Outstanding Graduate Teaching
Assistant of the Year

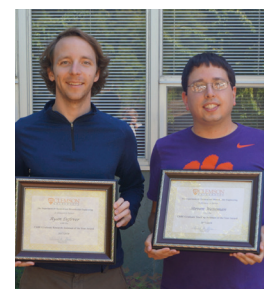
Steven Weinman

Outstanding Graduate Research
Assistant of the Year

Ryan Defever

Departmental Safety Award

Blenner Lab



2018 Graduate Research Symposium

ChBE held its annual Graduate Research Symposium in April in the Watt Family Innovation Center. Graduates were able to share their research with their peers through poster session and oral presentations

Symposium Winners

Best Oral Presentation

Allison Yaguchi
Ryan Defever

Best Poster

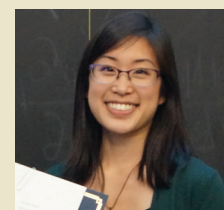
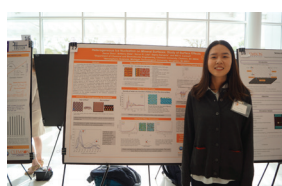
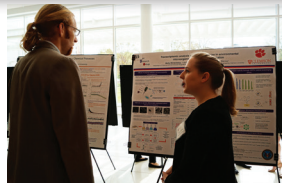
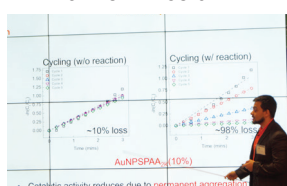
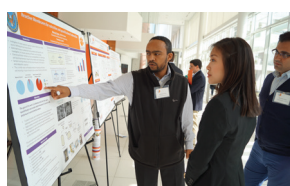
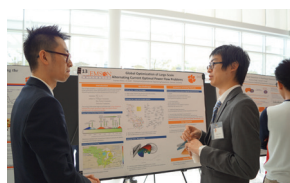
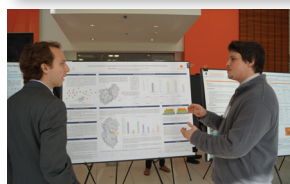
Jiarun Zhou
Jaime Idarraga-Mora

Oral Presentation Honorable Mention

Saptarshi Chakraborty

Poster Honorable Mentions

Molly Wintenberg
Abenazer Darge
Yuanxun Shao
Maxwell Hilbert



Graduate student, Allison Yaguchi, won the Outstanding Abstract Award at the American Society of Microbiology 2018 Microbe Meeting

Graduate student Jaime Idarraga-Mora earned an Honorable Mention for his piece titled "Water-Filtering Microtrees" in Clemson University's Science as Art Exhibition



Undergraduate Deidre Ward received the Abney Foundation Scholarship, the largest endowed scholarship program at Clemson

Community Outreach



Abernathy Park Rebuild

Staff members Joy Rodatz, Diana Stamey, and Terri McAllister, along with Dr. Bruce and grad student Bipin Paruchuri, participated in the Abernathy Park Rebuild community service project in Clemson over Spring Break. They worked on teams with other volunteers to replace old boards on the boardwalk along Lake Hartwell.



PEER/WISE 2018 STEM Day and Girl Scout Days

Through Clemson PEER/WISE 2018 STEM and Girl Scout Days, ChBE Outreach hosted approximately 70 middle school-aged students and 75 Girl Scouts, respectively. Graduate and undergraduate students demonstrated how chemical engineers make and use energy through chemical reaction activities such as electroplating and shooting hydrogen rockets.



Stone Academy "Science Fun Day"

Dr. Husson volunteered his time, knowledge, and resources to help plan Stone Academy's 2018 "Science Fun Day." Each year, the school spends an entire day doing science activities and experiments. Students rotate between stations that correspond to each grade level's curriculum standards for the year. Students have fun doing hands-on science while reinforcing concepts from class.