

Dr. Eric Davis receives \$566,359 NSF CAREER Award



Assistant Professor, Dr. Eric Davis, recently received a prestigious National Science Foundation CAREER Award. The National Science Foundation presents CAREER awards to support outstanding junior faculty who exemplify the role of teacher-scholars through research and education.

This five-year award will enable Dr. Davis and his research team to develop novel nanocomposite materials with functionality that can overcome practical hurdles for large-scale energy storage technologies, such as the redox flow battery. Inadequate ion selectivity in existing charged polymers utilized in redox flow batteries has motivated the

incorporation of nanoparticles, a versatile approach for tuning a wide range of properties of polymers. However, the molecular-scale heterogeneity in these materials has confused structure-property relationships needed for the development of viable nanocomposite materials for flow batteries. To address this gap, the research component of this CAREER award focuses on



advancing our understanding of fundamental polymer physics governing interactions between functionalized nanoparticles and charged polymers, and how these in turn alter resultant polymer architectures and bulk functional properties that are relevant for selective ion exchange. The design and synthesis of novel soft composite materials will be guided by these fundamental structure-property relationships to yield desirable molecular-scale interactions, thus enabling their functionality for energy storage applications. These findings and materials also have the potential to impact other critical modern technologies that utilize functional polymer membranes, such as water purification and energy delivery.

These research efforts are closely tied to educational initiatives that aim to engage and inspire the next generation of engineers and scientists. Undergraduate and graduate students contributing to this project will be exposed to advanced materials synthesis and characterization techniques, equipping them with the interdisciplinary skills needed to address tomorrow's engineering challenges. Together with chemical engineering students at Clemson University, this award will develop and implement a STEM-based afterschool program, for students grades 6-8, that emphasizes scientific problem solving through the application of polymer science concepts to tackle hands-on tasks inspired by real-world challenges.

NATIONAL FACULTY AWARDS

Dr. Scott Husson elected Fellow of AIChE



Dr. Scott Husson, William B. “Bill” Sturgis, '57 & Martha Elizabeth “Martha Beth” Blackmon Sturgis Annual Distinguished Professor in Chemical & Biomolecular Engineering and President and Founder of Purilogics, LLC, was elected as a Fellow by the American Institute of Chemical Engineers (AIChE). Fellow is the highest grade of membership in AIChE, and it can only be achieved through election by the AIChE Board of Directors. Election as a fellow recognizes “service to the profession” and “significant professional accomplishments.” Contributions in one of these areas must be outstanding, and some contributions in both areas are necessary. Election as Fellow reaffirms the high esteem with which Husson’s colleagues and peers view his distinctive professional achievements and accomplishments.

Dr. Husson’s research interests include membrane science and engineering, biologics recovery and purification, water purification, and nuclear forensics. He has served as principal investigator on 33 sponsored research projects and as co-principal investigator on 16 others, resulting in more \$13 million in funding. Husson is the author of 100 journal publications and book chapters that have been cited nearly 3,000 times. He has also been recognized as one of Clemson’s top teachers, winning Clemson University’s Prince Award for Innovation in Teaching. He also won the Murray Stokely Award and Byars Prize for Excellence in Teaching Engineering Fundamentals, both coming from the College of Engineering, Computing and Applied Sciences. He has mentored and advised 21 PhD students, nine postdoctoral researchers and more than 80 undergraduate researchers. Dr. Husson was also recently recognized by the State for his 20 years of service to Clemson University.

HUSSON RECEIVES PROFESSORSHIP



Dr. Scott Husson is the first recipient of a professorship named for Bill and Martha Beth Sturgis, who made history earlier this year by giving the biggest donation ever to the department of chemical and biomolecular engineering. Husson became the first William B. “Bill” Sturgis, '57 and Martha Elizabeth “Martha Beth” Blackmon Sturgis Distinguished Professor in Chemical and Biomolecular Engineering. Husson said funds that come with the professorship will open new avenues for exploratory research and for students to travel to conferences. He plans to direct some of the funds to help students learn about entrepreneurship.

Bill Sturgis, left, and his wife, Martha Beth, celebrated at the Poinsett Club in Greenville with Scott Husson, right. “It’s certainly a great honor to be selected as the recipient of this professorship – to be recognized by my peers as being

worthy of the recognition,” Husson said. “Of course, I’m really excited that it’s going to play a role in training students, particularly chemical engineering students at Clemson.” Sturgis said he and his wife established the professorship because they wanted to do something to benefit chemical engineering at Clemson, where he got his start studying under influential professor Charles E. Littlejohn Jr. “The quality of the professors makes the quality of the graduates,” he said. “If you’ve got the money to attract and support top professors, you’re going to attract top students who want to major in that particular area and go on and do well.”

The Sturgises donated \$600,000 for the professorship in the spring and said they plan to double their contribution in their will. The professorship contribution includes a \$500,000 endowment that is expected to generate investment returns that can be spent in accordance with the professorship. The remaining \$100,000 provides five years of funding while the returns are accumulating. David Bruce, chair of the Chemical and Biomolecular Engineering Department, congratulated Husson on the professorship. “Dr. Husson is a highly regarded educator and researcher,” Bruce said. “He is a prolific author of journal articles and is translating his research to real-world use through his startup, Purilogics. The

Dr. Amod Ogale elected SAMPE Fellow



Dr. Amod Ogale, Dow Chemical Professor of Chemical and Biomolecular Engineering and the Director of the Center for Advanced Engineering Fibers and Films, won the Fellow Award from the Society for the Advancement of Material and Process Engineering (SAMPE). The award represents world-class recognition “for distinguished contributions in the fields of materials and processes,” and he was among only three to win the award this year. He is also a Fellow of the Society of Plastics Engineers, and the recipient of 2013 Graffin Lecturer Award from the American Carbon Society and 2016 SABIC Composites Educator of the Year Award from Society of Plastics Engineers.

Dr. Ogale’s research expertise includes processing-microstructure-property relationships of carbon fibers, polymers, and composites. His students and post-doctoral fellows are investigating petroleum and biomass-derived precursors for high-performance and cost-competitive carbon fibers and their composites. He has published six book chapters, one patent, and over 150 research papers. Dr. Ogale has actively participated as PI and co-PI in interdisciplinary research project worth \$40 million. He been a PI or co-PI on more than 50 individual federal and industry-sponsored projects worth \$ 11 million and has been one of the founding members of the Center for Advanced Engineering Fibers and

Films (CAEFF) funded by NSF at \$ 29 million over 10-years where he has served as Topic/Thrust Leader, Deputy Director, and Director (present).

Over the past thirty two years, Dr. Ogale has taught numerous core courses for the Department, and has also introduced and taught inter-disciplinary courses on high performance fibers and polymer composites. He has served as research and dissertation advisor for over 60 graduate students and 7 post-docs. His students have taken up positions as university faculty and researchers at national labs and multi-national companies working with advanced materials and petrochemicals.

Sturgis professorship is a well-deserved honor.”

Husson’s research group is best known for developing membranes that can be used for purification of biologic drugs, an area that he continues to advance. He and Assistant Professor Joseph Scott, also of Clemson, are working to develop a new way of continuously manufacturing biologic drugs, instead of having to do it one batch at a time. Husson is developing new membrane materials, while Scott creates new computational algorithms that would make the new manufacturing process possible. Their research aims to increase productivity, while lowering capital and operating costs, and making it possible to adjust production volume on demand, Husson said.

In a separate project, Husson is working with collaborators from four institutions to develop new technologies aimed at recovering resources from municipal and industrial wastewater. Such wastewaters contain recoverable energy in the form of organic materials, nutrients that could be used for food production, and water that could be reused for drinking and agriculture. The team’s focus is on “anaerobic membrane bioreactors,” which have been used in climates warmer than South Carolina. “There’s technology that goes into operating and running them in cooler climates that would allow them to be used not only in South Carolina, but also throughout the U.S.,” Husson said. “Along with that, we’re working on new membrane materials that improve the efficiency by which we can recover energy and materials from these waste streams.”

Sturgis graduated from Clemson in 1957 with a degree in chemical engineering. He later graduated from the Advanced Management Program at Harvard University. 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. Sturgis returned to Clemson as an alumnus, where he is an emeritus member of the College of Engineering, Computing and Applied Sciences advisory board. He previously served as president of the Clemson University Foundation at a time when the big issues were construction of the Madren Conference Center and the John E. Walker Sr. Golf Course. Sturgis received Clemson’s Distinguished Service Award in 1990. Anand Gramopadhye, dean of the College of Engineering, Computing and Applied Sciences, thanked the Sturgises for their support. “Their inspiring gifts of time and treasure are having a direct, positive impact on our students and faculty,” Gramopadhye said. “I offer my heartfelt thanks to Bill and Martha Beth Sturgis and my congratulations to Dr. Husson.”

FACULTY HIGHLIGHTS



Dr. Chris Kitchens and his team of interdisciplinary faculty and staff at Clemson have teamed up with Trident Technical College and Spartanburg Community College to develop pathways for students from technical colleges in South Carolina to successfully transfer into engineering and computing degrees at Clemson. They were recently awarded a 5-year, **\$5 Million grant from the National Science Foundation S-STEM program** titled “**SPECTRA: Student Pathways in Engineering and Computing for Transfers**”.

The goal of SPECTRA is to increase the recruitment, retention, academic success, and graduation rates of academically talented, low-income students that begin their academic path at technical colleges and transfer into engineering and computing degree programs. The foundations of SPECTRA are: 1) a scholarship program to support low-income, academically talented transfer students, 2) evidence-based mentorship and cohort building through communities of practice and cognitive apprenticeship with student-centered resources, and 3) a PhD student immersion traineeship program (ACE Fellows) that institutes multi-institution curricular activities and provides a vehicle for educational assessment to identify key success indicators. The NSF S-STEM support will provide scholarships to more than 300 low-income, academically talented transfer students, as well as, implementation and assessment of a cohort model to address the well-known hurdles for transfer students and enhance potential for success. SPECTRA will also prepare 10 STEM Ph.D. students for careers in academia with a unique immersion experience and exposure to applied educational research. In addition to his role in the Chemical and Biomolecular Engineering Department, Dr. Kitchens is serves as the Assistant to the Dean for Academic Initiatives and will also will serve as Director and PI of this program.



Dr. Rachel Getman is stepping into the **Thrust Leader position for the Multiscale Modeling and Computation Core (MCC) Thrust of the Made in SC initiative**. She will be filling the role vacated by Dr. Chris Cox, who is retiring. Getman will be a co-leader of this state-wide research core. “The overall challenge in this area is the development of multiscale theories and computational tools capable of handling several orders of magnitude in length scales (Angstrom to mm) with required fidelity to fully integrate with and be informed by experimental studies. The national vision of materials design has prioritized the use of modeling and computation, integrated with physical experimentation and cyberinfrastructure.” MADE in SC is supported by a National Science Foundation award. For more information, please visit: <http://scepscoridea.org/MADEinSC/Research/MCC.html>

Dr. Mark Thies recently received a grant for \$1,795,216 from the U.S. Department of Energy’s BioEnergy Engineering for Products Synthesis (BEEPS) program for his project entitled “Lignin Fractionation and Valorization: Focusing on both Value and Quality”. Lignin is the 2nd most abundant biopolymer (to cellulose) on the planet, and is the only common one with aromaticity.

Thies and his team will be using his recently patented ALPHA process to both fractionate and purify lignin for conversion to high-value products, including carbon fibers, polyurethane foams, and activated carbons. In ChBE at Clemson, Professors Ogale, Scott, Kitchens, and Roberts are part of the team, which also includes investigators at Michigan State and Montana State Universities.



GAANN GRANT RECEIVED

ChBE receives GAANN Grant - Troubling statistics spark new effort to recruit chemical engineers

(For full article, please go to: <https://blogs.clemson.edu/chbe/2019/03/26/chbe-receives-gaann-grant-troubling-statistics-spark-new-effort-to-recruit-chemical-engineers/>)

One of the toughest challenges in engineering is coming sharply into focus as a group of professors begins fanning out across the South to recruit doctoral students to Clemson University. The group, led by **Mark Blenner**, is working to increase diversity in engineering. The low numbers are a nationwide concern and leave behind large swaths of the population, cutting them out of jobs that pay well above the national average.

Blenner and his group want to put a dent in the statistics by recruiting students who will work toward doctoral degrees in chemical engineering and then pursue careers in education and research. The idea behind the program is to create a new generation of professors to serve as role models for women and other students from groups underrepresented in engineering.

The goal is to graduate six highly qualified Ph.D. students in five years, said Blenner, the McQueen-Quattlebaum Associate Professor in the Chemical and Biomolecular Engineering Department. "If you make six faculty members, you're making six people who are going to influence about 100 students a year for the next 30 or 40 years," he said. "The initial investment could impact 4,000 engineers. You're basically investing in better preparing the next generation of engineers and scientists."

At stake is the future of the workforce in the U.S. chemical industry, the nation's second largest manufacturing sector with a value of nearly \$800 billion. The number of jobs for chemical engineers has steadily grown by 8 percent per year since 2008, Blenner said. The average entry-level salary for graduates with a Bachelor of Science in chemical engineering is closing in on \$70,000, he said.

The best chance for meeting the growing demand for chemical engineers is to recruit more students from underrepresented groups, Blenner said. Women, who make up more than half of the U.S. population, account for 32.4 percent of Bachelor of Science degrees in chemical and biomolecular engineering and 32.7 percent of Ph.D. degrees, he said. African-Americans account for 4 percent of the discipline's Bachelor of Science degrees and even fewer doctoral degrees, while composing 14 percent of the U.S. population, Blenner said. To reverse the trend, Blenner and his group will make use of Clemson's location in the heart of the South, home to more than half of the nation's African-Americans. Students are being recruited from Clemson and the nation's 107 Historically Black Colleges and Universities, particularly the 41 in South Carolina, North Carolina, Georgia and Alabama.

The program is backed by **\$746,250 from Department of Education's Graduate Assistance for Areas of National Need, often called by the acronym GAANN**. Clemson University is sharing the cost with \$187,563. David Bruce, chair of the department, congratulated Blenner on receiving the grant. "This program supports the nation's rapidly growing need for diverse and highly qualified chemical engineers to advance health innovation and sustainability," Bruce said. "Dr. Blenner and his team are well positioned for success with funding from the GAANN program."

Among the incentives is a \$34,000 annual stipend for students who participate in the program. "I'd like to emphasize that the student-centered, supportive Ph.D training environment is the real draw," Blenner said. "We do excellent research, and we do it with great care for our students." The first students entered the program this past January. Students who join will be considered fellows. Most Ph.D. programs focus heavily on research. Fellows will also do research but will have the added advantage of taking a deep dive into how to teach engineering at the collegiate level. They will take a course on teaching through Clemson's department of engineering and science education. Then fellows will work with professors to design and teach their own courses, including one through Creative Inquiry, a Clemson program that encourages undergraduate research. "If you talk to most young faculty members, they'll tell you how surprised they are at how hard it is to teach," Blenner said. "We're trying to lower that barrier."

Among the five-year goals of the program is to increase total enrollment in the chemical and biomolecular engineering Ph.D. program from 59 to 70 students. Ph.D. students typically conduct most of the day-to-day work on research projects, so the increase will allow the department to do more research, bringing annual expenditures to \$5 million a year, Blenner said.

Members of Clemson's GAANN team include Dr. Rachel Getman and Dr. Chris Kitchens, both associate professors in the Chemical and Biomolecular Engineering Department.

Anand Gramopadhye, dean of the College of Engineering, Computing and Applied Sciences, said the GAANN award is richly deserved.

"Grants through the GAANN program are highly competitive," he said. "The award is a testament to the strength of Dr. Blenner's proposal and Clemson's research community. I congratulate Dr. Blenner and his team."



Can we find better ways to treat cancer?

(Dr. Marc Birtwistle and his research group were recently featured in this article in [Clemson World](#))

In the medical marketplace, private companies — IBM for one — are beginning to pilot “virtual physician assistants,” computers capable of making recommendations to clinicians, streamlining and improving their decision-making about treating patients for everyday sickness and injury. One day, the models being built by Marc Birtwistle and his Clemson research team may do the same thing for oncologists, or even for industrial scientists developing anti-cancer drugs in the pharmaceutical industry. It’s a ways off, but the basic science he is building may pave the way for such innovation.

The Birtwistle lab combines computational research with experimental methods to better understand the behavior of cancer cells. Their goal: to better predict drug and drug-combination responses, which should result in better treatment therapies in the future.

“Ten years ago, simulating a single relevant cell process might have taken a day or so,” Birtwistle explains. “Now, we capture six to seven in a few minutes to an hour.” Working in the petascale — the benchmark for supercomputing speed: one quadrillion floating-point operations per second — allows their simulations to span a cross-section of virtual cancer patients while exploring the many uncertainties and combinations of drug regimens.

There’s no way to compare that work to what existed a decade ago, he says. “It was not even on the radar screen.” But supercomputing technology has made visible what was invisible prior. His group is interested in investigating to what extent computer simulation models can speed up their understanding of the complex problems this disease presents to clinical and industrial researchers. Currently, cancer precision medicine is based on matching genome and DNA data to targeted drugs. This has revolutionized cancer care, but it’s not always successful.

Birtwistle’s work uses genomic data of patients in simulation models that describe relevant biochemical networks where anti-cancer drugs actually work. Such models allow researchers to better understand mechanisms of drug action within the unique complexity of an individual’s tumor (namely brain tumors, though the lab works with a variety of cells and cancers). Those findings might one day be used to create personalized treatment strategies — by knowing how a drug will act in a patient, how much and how often the drug should be given, and the potential for toxicity, among other factors.

“Most cancers will require combination therapy to be controlled,” Birtwistle says. “However, there are dozens to hundreds of drugs to choose from, making their combinations — not to mention questions regarding the order in which to give them, and their dosing — almost innumerable,” he says. “My research focuses on building simulation tools that allow us to more comprehensively explore drug combination possibilities, all while accounting for, to the best of our knowledge, the complexity present in an individual’s tumor.”

The eventual goal is twofold, Birtwistle explains. “One is clinical: precision medicine,” he says. Given a cancer patient, can they make recommendations for successful combination therapies? The second is industrial: Given a new potential anti-cancer drug, what patients should be included in clinical trials, and what existing drugs should be combined to achieve better outcomes?

Current therapeutic approaches can’t comprehensively account for the vast complexity of variables in an individual’s tumor, he says. Without high-performance computer resources such as the Palmetto Cluster, his research goals would be “next to impossible.”



Clemson selected as Beckman Scholar Institution

Clemson University has been selected to participate in the Beckman Scholars Program, a prestigious recognition of Clemson's commitment to undergraduate research. Clemson is one of 13 programs nationally receiving funding to provide undergraduates with a unique 15-month mentored laboratory research experience. **Three of the 15 Clemson faculty involved in this grant are from our department: Dr. Rachel Getman, Dr. Mark Blenner, and Dr. Sapna Sarupria.**

"The recognition and funding provided by the Arnold and Mabel Beckman Foundation speaks to the demonstrated excellence in undergraduate research at Clemson University," said Robert Jones, Clemson's executive vice president for academic affairs and provost. "This award highlights not only the outstanding undergraduate students we have but also the commitment of our outstanding faculty in engaging undergraduates in meaningful research." Six Clemson undergraduates will be selected to participate in the program over the course of three years, awarding between one and three new Scholars each year. Each Beckman Scholar will receive an \$18,200 stipend plus funds to support scientific supplies and travel over two summer terms and an academic year. Prior to applying, students must have completed one year (or one semester and a summer) of research, have a 3.8 GPA and display excellence in research; analytical skills; and oral, written and digital communications skills.

"We're excited to have the ability to provide this tremendous opportunity to our exceptional undergraduates," said the program director, Barbara J. Speziale, associate director for Academic Affairs, the Watt Family Innovation Center, director of Creative Inquiry and professor of biological sciences. "The hands-on research experience and unique opportunities provided through this program will propel these students to graduate school and becoming leaders in their chosen fields."

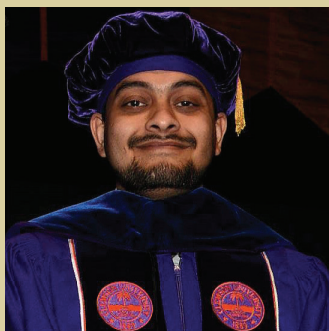
The Beckman Scholars Program is a limited-submission, invitation-only program. Each year, the Arnold and Mabel Beckman Foundation carefully reviews extensive information about institutions across the country and identifies colleges and universities to receive Beckman Scholars Program application invitations.

Invited institutions demonstrate a significant commitment to undergraduate research in chemistry, the biological sciences and/or interdisciplinary combinations thereof. They also show the capability to compete successfully on a national level for scientific research funds in peer-reviewed government and private foundation supported programs over previous years. Their faculties and their research facilities are judged to be of the quality necessary to support the caliber of undergraduate research program sought for Beckman Scholars. Members of the Arnold and Mabel Beckman Foundation's Scientific Advisory Council participate in the selection of institutions that are invited.

"Since the inception of the Beckman Scholars Program in 1978, there have been more than \$29 million in awards to over 1,400 undergraduate students through this program, providing each student with a unique 15-month mentored research experience," said Anne Hultgren, executive director of the Arnold and Mabel Beckman Foundation. "We're excited to learn more about the next cohort of Scholars and see them present their early research findings at our upcoming annual Beckman Symposium." This year's award is comprised of more than \$1.7 million in funding for 68 undergraduate scholars at 13 institutions.

Graduates

PhD Graduates



Dr. Saptarshi Chakraborty
Advisor: Dr. Chris Kitchens

Dissertation: Surface Functionalized Gold Nanoparticle Applications in Catalysis and Lipid-Nanoparticle Assemblies

Employer: Virginia Tech
Title: Post Doctoral Fellow

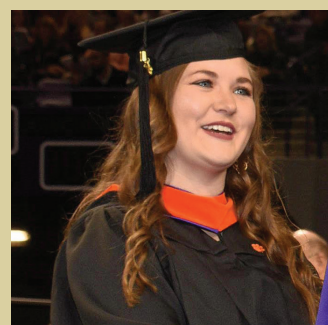


Dr. Jing Jin
Advisor: Dr. Amod Ogale

Dissertation: Carbon Fibers Derived from Lignin-Based Precursors with Enhanced Mechanical Properties

Employer: Celgard LLC
Title: R&D Scientist

Masters Graduate



Torrie Sewell
Advisor: Dr. Rachel Getman/
Dr. David Bruce

Employer: TechnipFMC
Title: Process Engineer

STUDENT HIGHLIGHTS

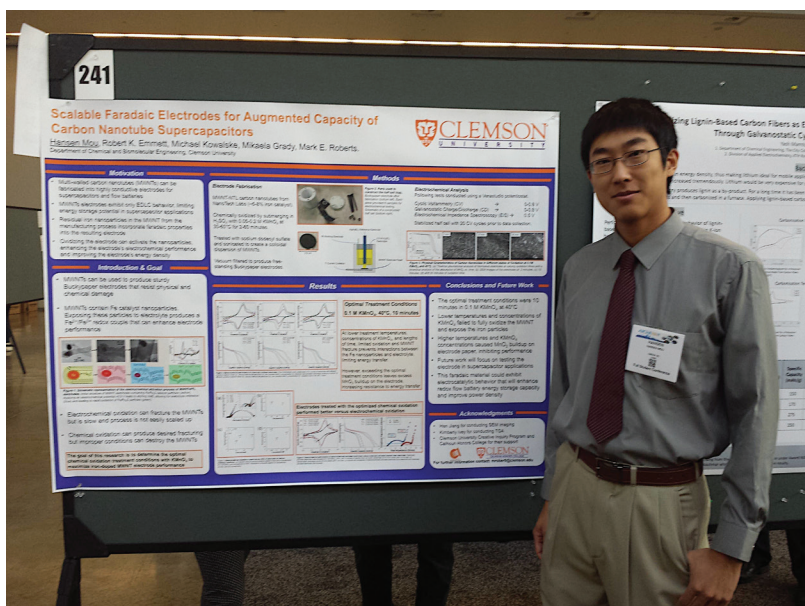


ChBE Undergraduate Featured in Chemical and Engineering News Magazine (C&EN)

ChBE senior Deidra Ward was recently featured in the November 5th edition of Chemical and Engineering News Magazine (C&EN). The article titled, "Diversity in Focus at NOBCCChE," highlighted her experience at the National Organization for the Professional Advancement of Black Chemists & Chemical Engineers (NOBCCChE) annual conference. Deidra is the president of Clemson University's NOBCCChE student chapter, which was founded last year. She attended the conference in September with other Clemson

NOBCCChE chapter executive officers. The article discusses Deidra's career aspirations and features her poster on polymer formulations for bioadhesives that she presented at the conference.

Hansen Mou Places 3rd at AIChE Annual Meeting



Senior Hansen Mou won 3rd place in the Fuels, Petrochemicals and Energy I category at the AIChE Annual Meeting undergraduate poster competition in Pittsburgh. His poster was titled "Scalable Faradaic Electrodes for Augmented Capacity of Carbon Nanotube Supercapacitors." He conducted the research with Dr. Mark Roberts and graduate student Bobby Emmett.

Bluegrass Ensemble





ChBE Graduate Students Win Three Minute Thesis

Graduate students from the Department of Chemical and Biomolecular Engineering won first place in both categories at Clemson University's Three Minute Thesis (3MT) competition on November 2nd.

Joshua Osuofa won the graduate student category for his presentation, "Filters for faster production of Biologics," and James Foster won the PhD candidate category for his presentation, "Innovative Materials for the Screening of Plutonium in Water Sources." Dr. Scott Husson advises both students. James will go on to represent Clemson at the February 2019 Conference of Southern Graduate Schools (CSGS) 3MT competition in Knoxville, TN.

3MT is a research communication competition that gives higher degree students just three minutes to present their work and its significance without using jargon to a non-specialist audience. This year, more than 50 students representing all colleges at the university participated in the competition.

ChBe Senior, James Martzin, is a member of a **Bluegrass Ensemble called Tigertown Roots.** Tigertown Roots was recently featured in a Clemson World article. James reflected on his experience with the band: "I grew up listening to bluegrass music in upstate South Carolina and have always loved it. I learned some piano in elementary school and a bit of guitar in high school. During my sophomore year at Clemson, I played with a friend's banjo one night and I was hooked. I bought one and found a fellow to teach me in Seneca. That semester (spring '16), I spent most of my tutoring salary on banjo lessons, and I started looking for folks to play with. The next fall I went to the Balsam Range concert at the Brooks Center and saw the Tigertown Roots ensemble join them on stage. After that I emailed Dr. Hosler, and he invited me to play with them. Since then we have played at small places all over the upstate and we will have a performance in Brooks later this semester."

For more information, go to <https://clemson.world/bluegrass-ensemble/>

Sallye Gathmann Wins Awards at AIChE Annual Meeting in Pittsburgh

The American Institute of Chemical Engineers (AIChE) presented Sallye Gathmann with the 2017-2018 Donald F. & Mildred Topp Othmer Scholarship Award at their annual conference in Pittsburgh during the Student Awards Ceremony on Sunday, October 28. Sallye was nominated by the Clemson University AIChE Student Chapter to receive this honor.



The scholarship of \$1,000 is a competitive award only given to 15 AIChE Student Members annually from around the country based on academic achievement and student chapter involvement.

Sallye was also recognized at the conference for winning second place for the Separations category in the 2018 Undergraduate Student Poster Competition. Her poster was titled, "Ultrapure Lignin via Liquid-Lignin Lignin-Solvent Systems: Phase Behavior & Characterization." She is advised by Dr. Mark Thies.

The Department of Chemical and Biomolecular Engineering would like to congratulate Sallye on her achievements!

STAFF HIGHLIGHTS

Terri McAllister Wins Administrative Award from CECAS



The College of Engineering, Computing, and Applied Sciences held its annual staff awards luncheon in December at the Madren Center. Four staff members in the College were honored. **Terri McAllister, ChBE's Office Manager and Fiscal Analyst, received the Dean's Exceptional Staff Award.**

Terri started at Clemson in our department in 2009, and has been a valuable asset to the department working with our financials, publications, and alumni relations.

Joy Rodatz Receives 10-Year Seniority Award

Joy Rodatz received her 10-year seniority award from the State of South Carolina. Joy started in our department in 2008, as our Student Services Coordinator. She recently received a promotion to Student Services Coordinator II.

With this promotion, Joy will be advising our undergraduates in addition to her normal duties of scheduling classes, working with undergrads to ensure they are taking the right classes, and ensuring their records and transcripts are correct. Joy cares about the success of our students and it shows!

Congratulations, Joy, on a job well done!!



Chad Marcengill joins ChBE



We are pleased to announce that **Chad Marcengill** joined the Chemical and Biomolecular Department in November as a Lab Technician, reporting to Bill Coburn.

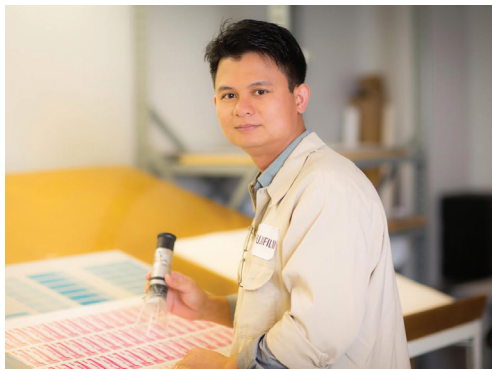
Chad's background is in power generation operation and maintenance, as well as design and engineer tools and techniques to service the nuclear power industry. He is an Accredited Nuclear Station Instructor with the INPO (Institute of Nuclear Power Operations) and received the 2017 Core Award at Exelon (Limerick Generating Station) from the NRC (U.S. Nuclear Regulatory Commission).

Outside of work, Chad is a songwriter, composer, and publisher with BMI (Broadcast Music Inc.) and a session musician in both vocals and guitar. His hobbies include building and restoring automobiles and motorcycles from the 1930's.

Please join us in welcoming Chad Marcengill to the ChBE Team!!

ALUMNI HIGHLIGHTS

ChBE Alum Thang Nguyen Featured in Greenville Business Magazine



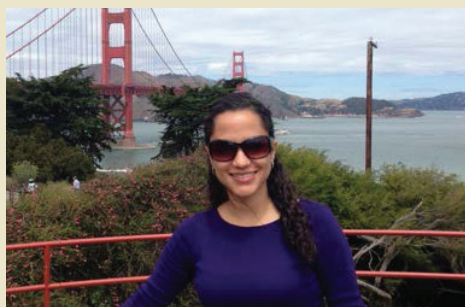
A Greenville Business Magazine article about engineering in the Upstate of South Carolina features ChBE class of 1999 alumnus, Thang Nguyen. As a chemical engineer working at a sprawling plant at FUJIFILM Manufacturing USA, Inc. in Greenwood, Nguyen discusses the importance of engineers to the Upstate. The Greenville area ranks at the top of the US for concentration of engineering talent, which has contributed to the Upstate's quality of life and stimulated economic development by bringing major manufacturers to the area. Nguyen also shares his perspective on what makes a successful engineer. To learn more about Nguyen and how the Upstate became such an engineering hub, go to this link to the Greenville Business Magazine article:

<http://www.greenvillebusinessmag.com/2018/05/31/174403/engineering-the-upstates-braintrust>.

CEGSO Hosted Industry Panel with Graduate PhD Alumni

CEGSO hosted an industry panel webinar on February 28, 2019. The panel was comprised of three Clemson Chemical Engineering PhD alumni – Kryssia Diaz (May 2016), Roque Gochez (May 2018), and Murri Shabbir-Hussain (December 2017). The alumni addressed questions from our current graduate students about the transition from graduate school to industry, such as transferrable skills, interview tips, and prior experiences during graduate school that contributed to a successful transition to industry. Highlights and tips gathered from the alumni during the webinar are:

- Useful skills: statistics, programming, networking, collaboration, basic science knowledge.
- Networking not only gets you the job; it helps you keep the job. Most of the job is talking with other departments so have soft skills.
- Roque and Murri both got their jobs from networking during conferences.
- Be able to concisely discuss your work on multiple levels (general to technical).
- During the research presentation at the interview, be very precise with your timing. 45 minutes means 45 minutes.
- Be able to be open-minded and creative about your field. Industry is all about looking ahead to the next idea.



Kryssia Diaz - PhD May 2016

Advisor: Dr. Mark Roberts

Area of study: low-cost, carbon-based micro- and nano-structured electrodes for high performance supercapacitors.

Employer: Intel Corporation

Position: TD Module and Integration Yield Engineer. She is responsible for leading scientific research enabling manufacture of innovative device architectures coupled with the realization of these architectures. This includes experimentation to meet engineering specifications as well as ensuring successful transfer of technology to manufacturing



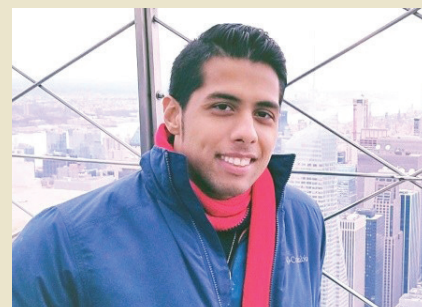
Roque Gochez - PhD May 2018

Advisor: Dr. Chris Kitchens

Area of study: Fundamentals of the magnesium oxychloride cure reaction in conjunction with Jet Products LLC to improve quality and performance of their products.

Employer: Dow Performance Silicones

Position: R&D Engineer He is responsible for leading the research, optimization and scale-up of silicone chemistry processes that produce materials used in personal care products, high performance fluids, and coatings.



**Murri Shabbir-Hussain -
PhD December 2017**

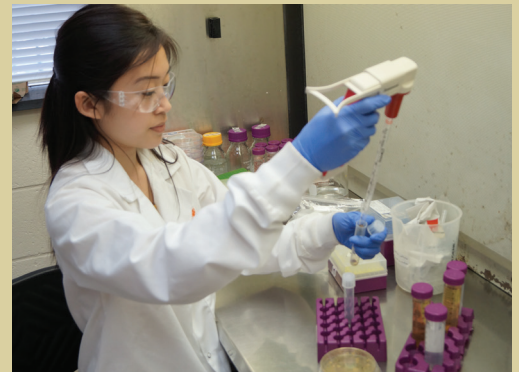
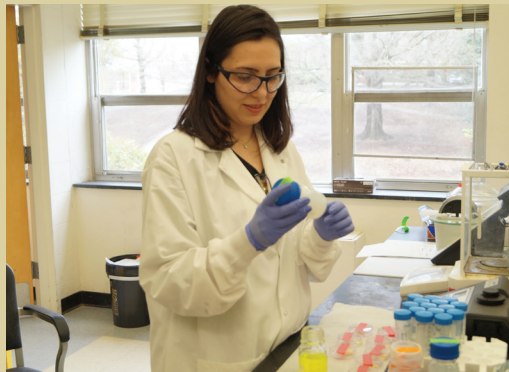
Advisor: Dr. Mark Blenner

Area of study: Developing genetic tools for a model industrial yeast called *Yarrowia Lipolytica*.

Employer: Zymergen Corporation

Position: Metabolic Engineer. He is responsible for developing a high-throughput biology-engineering infrastructure for screening metabolic pathways in various microbes. He builds metabolic models and pathways to screen for novel biomolecules with advances sensing and therapeutic applications. He is currently transitioning to fermentation process development.

GAANN ????



The Department of Chemical and Biomolecular Engineering is proud to announce the first recipients of the department's GAANN Fellowship grant: (L-R) Abenazer Darge, Anna Malakian, and Allison Yaguchi. This program provides fellowships to assist graduate students with excellent records who plan to pursue the highest degree available in their course of study in a field designated as an area of national need. Anna is a PhD Candidate in the chemical engineering at Clemson University and a Graduate Assistance in Areas of National Need fellow. She got her Master's degree at New Mexico State University where she has developed her interest for membrane science for water treatment. She has a passion for interdisciplinary approaches to ease clean water availability for all people around the world. Her dissertation research focuses on the development of anti-fouling membrane by understanding the role of membrane surface patterning plays on fouling process which is one of most expensive challenges in membrane technology for water purification. She applies patterns on membrane surface by thermal embossing directly onto membrane. She develop a home-made constant flow set-up in the lab to study the membrane performance after patterning. Also, she uses different microscopy techniques to characterize the surface of membrane and foulant behavior on membrane surface. She believes that the GAANN fellowship is helping her to develop her teaching and research skills to be prepare for an academic career which is her career goal.