



THE UNIVERSITY OF
ALABAMA IN HUNTSVILLE

COLLEGE OF ENGINEERING

Department of CHEMICAL & MATERIALS ENGINEERING



CME PIPELINE // FALL 2019



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CHAIR'S MESSAGE

Greetings from Huntsville! I have truly enjoyed my first year as the Chair of Chemical Engineering at UAH! I relocated to UAH in 2018 after a long-tenure at the University of Nebraska-Lincoln. It has been a year of many firsts in learning!

Dr. Krishnan Chittur and Dr. Ramon Cerro have taken retirement upon a distinguished career and service at UAH. We have added Dr. Isaac Torres-Diaz to our faculty this Fall 2019.

We awarded 39 degrees last year. Our undergraduate enrollment is around 275. We have a total of 8 graduate students in both Chemical Engineering and in the interdisciplinary Biotechnology program.

Sincerely,

Dr. Anuradha (Anu) Subramanian
Department Chair
Chemical and Materials Engineering Department

UNIT OPERATIONS LABORATORY UPDATE

We are working to upgrade the Unit Operations Laboratory experience for our juniors and seniors. We are aiming to include concept based experiments in continuous distillation, process control, transient heat conduction, polymer engineering, drug-delivery platform and bioreactors. It is a work in progress and we will keep you updated with progress and pictures of the remodeled laboratory experience.

WHAT'S NEW WITH OUR FACULTY

Dr. Isaac Torres-Díaz joined UAH's Department of Chemical and Materials Engineering this academic year as an Assistant Professor. Prior to coming to UAH, Torres-Díaz was a postdoctoral scholar at Johns Hopkins University (Baltimore, MD), postdoctoral scholar at the University of Florida (Gainesville, FL), and a graduate research assistant at the University of Puerto Rico (Mayagüez, PR).

Dr. Torres-Díaz's research combines the synthesis, characterization, real-time imaging, and multi-scale modeling, to fundamentally understand the interactions and collective response of colloidal suspensions composed of anisotropic particles. His research interests aim to apply the fundamental understanding of the anisotropic particle behavior and interactions under the influence of external fields in various technologies, such as tunable/responsive materials, photonic materials, biosensors, tissue engineering, passive and active suspensions, drug delivery, hyperthermia, and cooling of electronic components, among others. Dr. Torres-Díaz has published 18 peer-review journal articles, and 18 Conference presentations.

Isaac said he chose UAH because the University is located in a strategic location that can burst



Dr. Isaac Torres-Díaz

Assistant Professor, Chemical and Materials
Engineering Department

the collaboration with several nearby companies in different research areas. Additionally, the perspective undergraduate and graduate students offered me a good chance to start my academic career as Assistant Professor.

"My goal is to contribute to the mission of the Department of Chemical Engineering by helping to foster a community of learning and scholarship, to create new knowledge and technology and to enable our graduates to identify and achieve their goals," Isaac said.

Dr. Yu Lei was successfully tenured and promoted to the rank of an Associate Professor. He continues to be an active researcher in the area of thin film and catalysis sponsored by NSF and ACS.

Dr. Roh established a new research collaboration with Refuge Biotechnologies Inc (Menlo Park, CA). In this

new research contract with a rapid-growing start-up company that is dedicated to novel adoptive T cell therapies for cancers, Dr. Roh and his team will develop new technologies to characterize the T cell products more precisely using a biomaterials-based standardized approach. Once successful, the outcome of this research will make the new cell therapy products much safer and more functionally defined.

Dr. Banish received external support from two NASA Grants to further his research on thermophysical property research. One grant, a NASA-REDDI program, is to determine the thermal diffusivity of liquid gallium. Thermal diffusivity determinations conducted on the Earth in terrestrial gravity are likely to be contaminated by convection. The experiment will be conducted on the Blue Origin New Shepard suborbital launch vehicle. Four experiments will be conducted during the 240 seconds of low-gravity that occurs during the parabolic portion of the flight. Dr. Banish also has a NASA-EPSCoR grant to determine the viscosity, density, and surface tension of off-eutectic Si-Co alloys. These experiments will be done on the International Space Station using Electrostatic Levitation. The thermophysical properties are important for understanding solidification behavior of the alloys.



Dr. Subramanian has received a R21 and R03 grant funding from NIH to develop translatable therapies based on low-intensity-ultrasound to develop strategies to improve outcomes upon cartilage repair.

uah.edu/news/research/stronger-knee-joint-repairs-could-result-from-cme-chairs-research

Dr. Jeffrey Weimer is in charge of the UAH research and creative experience for undergraduates (RCEU) summer program.

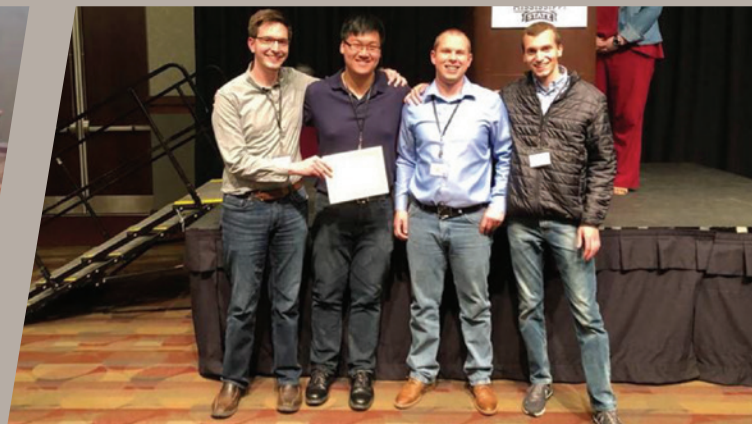
CHEMICAL ENGINEERING

STUDENT STORIES

Our student chapter of AIChE is active and this last year they won second place at the AIChE jeopardy. They are working on a CHME-CAR concept and hope to compete at the national AIChE Annual Meeting.



CHME Seniors at the **AIChE Team Jeopardy**



L to R: Jonathan Cookston, Shaun Scheurich, Michael Reeves

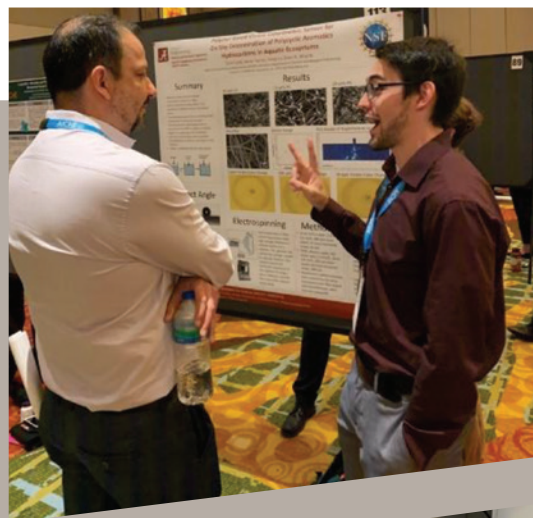
MR. ZHUORAN GAN and **MS. COURTNEY ANDERSON** received
2019 Outstanding Graduate and Undergraduate Student Awards
 In Chemical Engineering, respectively.



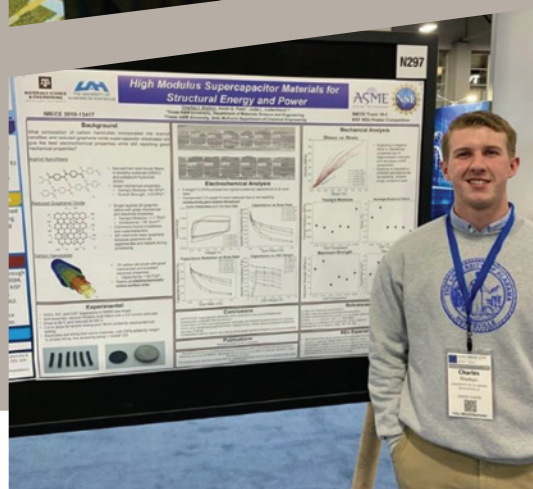
L to R: Zhuoran Gan, Courtney Anderson and Dr. Anu Subramanian

- ▶ **MR. SPENCER SIMS** (ChE, '18) and **MR. ALEX BOXOMEYER** (ChE, '19) are successfully commissioned as officers with the U.S. Air Force and Navy, respectively.
- ▶ **MR. DAVID WEAVER** (ChE, '20) took an internship position in Australia during the summer of 2019. David was sponsored by the prestigious Gilman International Scholarship from the U.S. Department of State. His summer project was advised by Dr. Banish. gilmanscholarship.org/wp-content/uploads/2019/05/Summer-2019-Recipients-Updated-4.30.19.pdf
- ▶ **MS. ANVI DALAL** (ChE, '20) enjoyed her summer Internship with Evonik, one of the biggest chemical companies in the world. corporate.evonik.com/en/
- ▶ **MS. ANVI DALAL** (ChE, '20) is selected to receive the Tau Beta Pi Scholarship from the National Tau Beta Pi Honors society in June, 2019. She is the sole recipient from UAH this year. tbp.org/memb/ScholarArchives/ScholarList/2019-20.pdf
- ▶ **MS. FAUSAT ISU** (ChE, '22) won 2nd place in the 12th Annual Von Braun Memorial Symposium Student Poster Contest based on her RCEU summer research at UAH. uah.edu/news/news/von-braun-symposium-research-poster-contest-attracts-29-students

- ▶ **MR. CLINT COOK** (ChE, '20) won 1st place in the Environmental Engineering section in the student poster competition in the 2019 national AIChE Annual Meeting in Orlando, FL.



- ▶ **MR. CHARLES SHELTON** (ChE, '20) presented poster about his summer research project supported by NSF REU Program at the IMECE meeting 2019 at Salt Lake City, UT.



GRADUATE STUDENTS

GRADUATE DISSERTATIONS

WILLIAM SIENICKI

MSE in Chemical Engineering, 2019

Thesis Title: Synthesis of Silver Thin Films via Atomic Layer Deposition

Advisor: Y. Lei

HECTOR SANCHEZ-MORAN

MSE in Chemical Engineering, 2019

Thesis Title: Oxime cross-linked alginate hydrogels with tunable stress relaxation for immune cell encapsulation

Advisor: K. H. Roh

After graduation, Hector started his PhD study at the Department of Chemical and Biological Engineering at University of Colorado Boulder.

RACHEL LAUREN STOKES

MSE in Chemical Engineering, 2019

Thesis Title: Migration of artificially activated B cells in a microfluidic device-induced CXCL-12 gradient

Advisor: K. H. Roh

After graduation, Lauren continues to work for CFDRC, Inc. (Huntsville, AL).

VEENA VINOD

MS in Biotechnology, 2019

Thesis Title: Isolation and activation of B lymphocytes using magnetic microbeads-assisted reversible bioconjugation

Advisor: K. H. Roh

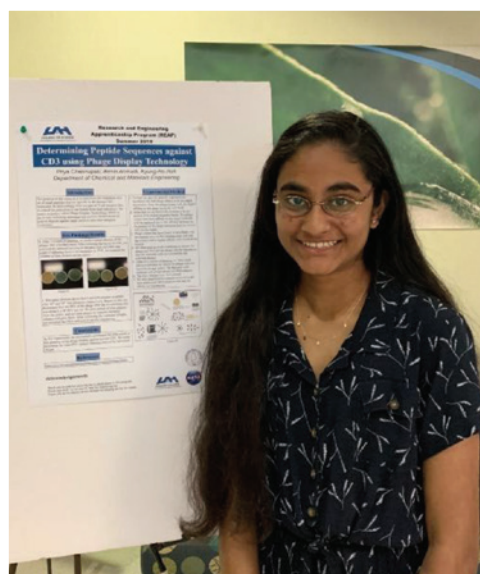
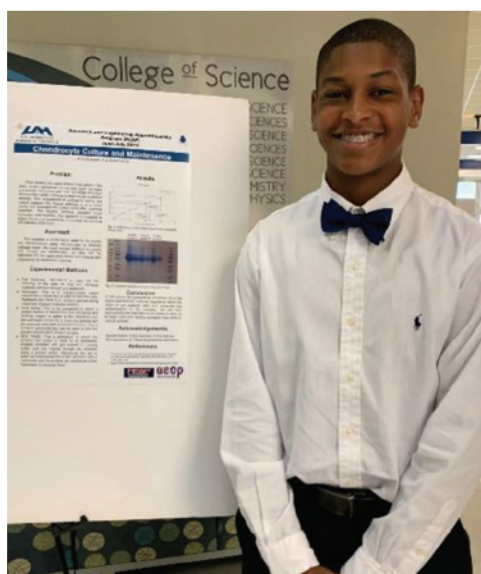
Upon graduation, Veena will join CytomX Therapeutics (San Francisco, CA) as a Research Scientist.



L to R: Lauren Stokes, Dr. K. Roh and Hector Sanchez

OUTREACH

Chemical Engineering faculty members, including Drs. Subramanian, Lei and Roh hosted four high school researchers during the summer through the Army sponsored Research & Engineering Apprenticeship Program (REAP).



Class of 2019



CONGRATU

As always, do stay in touch with the department

Graduated!



ULATIONS!

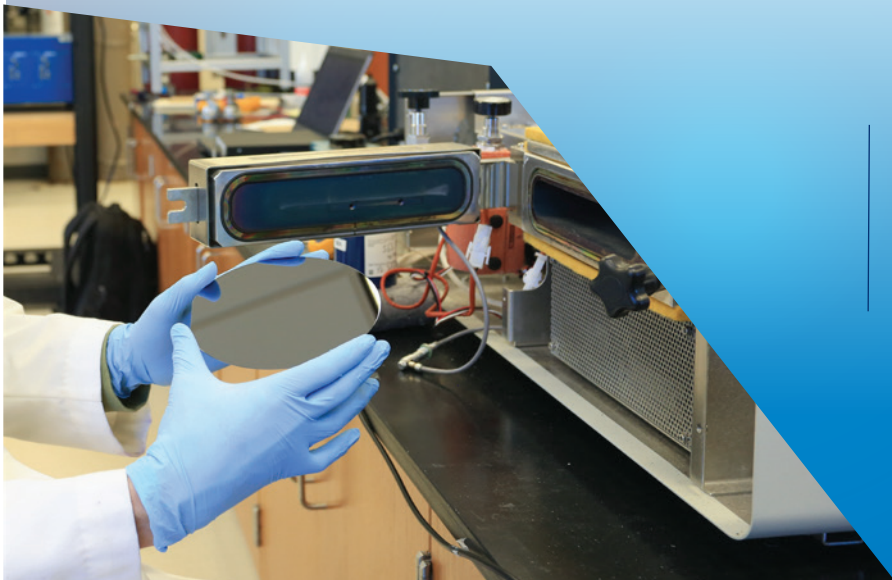
and reach out when you plan to be on campus.



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The Department of Chemical and Materials Engineering at UAH is dedicated to educate and inspire students to contribute to human society through the creation, application, and innovation of chemical and materials engineering knowledge. We do this by through outstanding research, teaching, and service to our profession, our state of Alabama, the nation, and the world.