



CONNECTION

2018-2019 A Year In Review

Message from the Department Head >

Alumni and Friends:

Greetings from Blacksburg. I hope this latest edition of the ChE Connection finds you happy and well. I reached an anniversary of sorts during this past year, completing a five year term year as department head in the fall of 2018 following a year as interim. As I look back on this time I realize how fortunate we have been as a department. The last six years have been a time of growth at Virginia Tech. The Chemical Engineering Department has benefited from a significant investment by the College of Engineering during that time. We moved from Randolph Hall to new facilities in Goodwin Hall five years ago. We have hired six new tenure-track faculty (more than 50 percent growth), increased our research expenditures by 65 percent, and our graduate student population by more than 30 percent. If you haven't looked at our web page recently, you might be surprised to see all the new faces. My thanks go to our faculty and staff for all their hard work, and to the Dean's office for their investment in new faculty positions for the department.

We have managed all this growth while maintaining the quality of our undergraduate program and handling the larger number of undergraduate students being admitted to the College of Engineering and the department. We were also fortunate to bring in Dr. Gary Whiting, the third holder of the Joseph H. Collie Chair (thank you Joe and Barbara!). With his experience from 30 years in industry, he is helping our students develop their business skills, teaching in the undergraduate core curriculum and providing outstanding academic and professional advising to our students.

The past year has been an extraordinarily busy time for the department, as will be evident from the newsletter. In May we had a graduating class of 102 B.S. chemical engineers with a remarkable level of engagement outside of the usual course experience: 61 percent had co-op or intern experience, 42 percent had a study abroad experience, and 51 percent had an undergraduate research experience. As it has for the past decade, the demand remains high for our undergraduate major. We anticipate a graduating class of over 100 next spring in 2020.

All of our growth does not come without challenges. The lion's share of start-up costs for new faculty (equipment, travel, student support) falls to the department and is not funded by the state. Likewise, our support for student travel (ex., travel scholarships for the U.O. Lab in Denmark), undergraduate research, scholarships, and financial support for our student organizations (AICHE, Omega Chi Epsilon, Chem-E-Car team, ChEGSA) is stretched by our increasing student population. Our continuing success as a department owes a debt of gratitude to our alumni who give back to the department through their service, through giving, and through the hiring of our graduates. With each passing year the philanthropy of our alumni becomes more important to the department. Your gifts allow us to enhance the educational experience and the learning environment for all of our students by supporting initiatives for which there is no state budget. Thank you for your help!

On a more personal note, I had a new experience last fall at the start of my separations class. One of my junior students stopped by after class to tell me his mother was a student in one of my classes back around 1989 or 1990. After 33 years on the faculty at Virginia Tech, I'm starting to see the children of former students come through the department. I'm not sure whether to feel old or invigorated, so I am focusing on the latter.

Best wishes,



David F. Cox

David F. Cox
Professor and Department Head

New faculty member, Huiyuan Zhu

Dr. Huiyuan Zhu joined the department from Oak Ridge National Lab as a tenure-track assistant professor for the 2018-19 academic year.

Zhu's research focuses on electrochemical reactions, which holds a promise for next-generation sustainable energy conversion processes.

She was a recipient of the 2014 Liane B. Russell Fellowship. In 2013, Zhu was awarded the Chinese Government Award for Outstanding Self-Financed Students Abroad and the International Precious Metals Institute Gemini Graduate Student Award.

Zhu received her bachelor's degree from the University of Science and Technology of China, and her master's and her doctoral degrees from Brown University.



Huiyuan Zhu



Joseph H. Collie

Joseph H. Collie honored as first member emeritus of the chemical engineering advisory board

Joseph H. Collie was named the first member emeritus of the chemical engineering advisory board based on his exceptional support of and extended service to the Department of Chemical Engineering at Virginia Tech.

In addition to his past service to the university as a member of the Virginia Tech Foundation Board, Collie served as a member of the chemical engineering advisory board for 15 years through five consecutive terms running from the fall of 2003 through the spring of 2018.

Collie's support of the department and chemical engineering students extends far beyond his service on the advisory board. His philanthropy has directly impacted the department, first with the establishment of the Joseph H. Collie Endowed Chaired Professorship in Chemical Engineering in 1995 and with the Joseph and Barbara Collie Scholarship in 2010 for an undergraduate student majoring in chemical engineering.

Collie is a member of the *Ut Prosim* Society of Virginia Tech and the College of Engineering's Academy of Engineering Excellence.

Professor Preston Durrill retires after 35 years of teaching at Virginia Tech

Dr. Preston Durrill has retired after 35 years of teaching at Virginia Tech. He served as an undergraduate advisor and adjunct professor for chemical engineering.

Durrill previously retired in 2002 from Radford University where he taught chemistry for 37 years. In addition to his teaching duties while at Radford, in 1983 he began teaching at Virginia Tech in the Chemical Engineering Unit Operations Laboratory, a six-week summer laboratory experience for rising seniors.

In 2004, he took on additional duties in the Department of Chemical Engineering by teaching the introductory Mass and Energy Balances course to sophomores and by serving as an undergraduate academic advisor. That same year, Durrill also began teaching General Chemistry I and II to hundreds of freshmen in the Department of Chemistry.

A favorite among ChE students, Durrill received the Faculty Appreciation Day Students' Choice Award from the Virginia Tech Student Alumni

Association in 2005, 2006, and from 2008-2015. The quality of his teaching was widely recognized. He twice received Virginia Tech's Sporn Award for excellence in teaching introductory subjects, and the William E. Wine Award for a history of university teaching excellence. He was also a member of the VT Academy of Teaching Excellence.

Durrill received a bachelor's degree in chemical engineering and a master's degree in nuclear engineering from the Massachusetts Institute of Technology and a doctorate in chemical engineering from Virginia Tech in 1966. We wish Professor Durrill the best in his retirement!

To honor Dr. Durrill's legacy, we have established a scholarship fund in his name, the Preston Durrill Scholarship Fund. Contributions to the scholarship will be awarded to deserving students annually. Please contact Virginia Tech Gift Accounting at 800-533-1144 or give.to.vt@vt.edu.



Preston Durrill



Student association hosts 11th annual Graduate Student Symposium

The Chemical Engineering Graduate Student Association hosted the annual Graduate Student Symposium on April 19, 2019.

The one-day event featured 18 oral presentations covering all aspects of graduate research in the department and a poster session, including contributions from 8 undergraduate researchers.

The program co-chairs for the symposium were graduate students Cailean Pritchard and Albert Zhong. Highlighting the program was the keynote address given by Dr. Zach Ulissi of the chemical engineering department at Carnegie Mellon.



Chang Lu

Chang Lu Awarded NIH Grant to Develop New Epigenomic Technology

Professor Chang Lu received a three-year grant from National Human Genome Research Institute (NHGRI) of NIH, for his project “Drop-BS: high throughput single-cell bisulfite sequencing on a microfluidic droplet platform”. With the project totaling more than \$600,000, Lu and his team will develop a novel technology that allows mapping of epigenomes of single cells rapidly and in a large number. Such a tool will find use in analyses of scarce patient samples with a high heterogeneity. The technology will be demonstrated using samples of breast tumors. The project is a collaboration with Rong Li, professor at the University of Texas Health Science Center at San Antonio.

Stephen Martin awarded AAAS Science and Technology Policy Fellowship

Dr. Stephen Martin, an Associate Professor in the Chemical Engineering Department at Virginia Tech, was awarded an AAAS Science and Technology Policy Fellowship. Martin spent the 2018-2019 academic year on sabbatical working in the Advanced Manufacturing Office at the Department of Energy, located within the Office of Energy Efficiency and Renewable Energy in Washington, DC. Martin was among 275 scientists and engineers who spent the year serving professionally in federal agencies and congressional offices.



Stephen Martin

Erdogan Kiran Participates in 4th International Seminar on Aerogels

Professor Erdogan Kiran participated at the 4th International Seminar on Aerogels held at Hamburg University of Technology in Germany. He presented a talk on High Pressure Torsional Braid Analysis which he has developed with Dr. John C. Hassler as a unique new technique for the assessment of thermal transitions and changes in moduli of polymers exposed to compressed fluids. Such characterizations are essential for rational design of processes to generate highly porous extremely light polymeric materials and networks using physical foaming agents such as supercritical carbon dioxide.



Erdogan Kiran

Gary Whiting reappointed Joseph H. Collie Professor

Dr. Gary Whiting, professor of practice of chemical engineering in the College of Engineering at Virginia Tech, was reappointed as the Joseph H. Collie Professor of Chemical Engineering by Virginia Tech President Tim Sands and Interim Executive Vice President and Provost Cyril Clarke.

The Joseph H. Collie Professorship in Chemical Engineering is awarded to a distinguished engineer who has extensive industrial experience and expertise in production, marketing, and sales of chemical products to introduce chemical engineering students to advanced business and marketing concepts in chemicals distribution management. The professorship was created in 1995 with a gift by its namesake, who earned his bachelor's in chemical engineering from the university in 1950.

Whiting has held the title of Collie Professor of Chemical Engineering since 2016.

Whiting has more than 30 years of experience in the chemical industry and 30 years of experience as a small business owner and entrepreneur. He retired from DuPont in 2015, with significant experience in marketing, new business development, process and product development, and project engineering.

During the first half of his career with DuPont, he worked largely in research and development implementing process improvements resulting in patents in the area of reactor design and control and new product development. Whiting rose through the technical ranks and was named as a DuPont Titanium Technologies Research/Engineering Fellow in 2004.

As Business Venture Manager leading DuPont Titanium Technologies' effort in the area of nanomaterials, Whiting's team created a new nano-titanium dioxide product that was launched as a specialty product useful in UV absorption and scattering in polymer systems. Whiting was a co-author of the highly regarded Nano Risk Framework, a collaborative effort between DuPont and the Environmental Defense Fund for the responsible development, production, use and disposal of nano-scale materials. For this work, he received the DuPont Sustainable Growth Excellence Award in 2008.

Whiting's final seven years at DuPont Titanium Technologies (now Chemours Titanium Technologies) was as global product manager where he was responsible for the profitability, competitiveness, quality, and sustainability of a more than half-billion dollar global product portfolio. In this role, Whiting worked with team members from Asia, Europe, North America, Latin America, and South America, providing him with a global perspective and key global contracts.

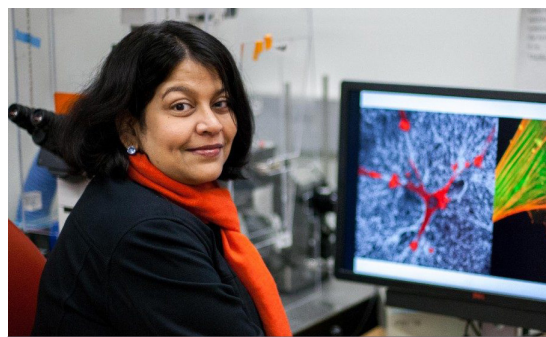
Since his arrival at Virginia Tech in 2016, Whiting has developed and taught a senior-level course, "Business and Marketing Strategies in the Process Industries" that is unique among chemical engineering and marketing departments.

He also serves as an undergraduate academic and career advisor, and offers a non-credit course on "Chemical Engineering Job Search". Whiting's breadth and depth of chemical industry knowledge, including technical, business, and marketing, together with his dedication and patience in helping undergraduate students, will be a great benefit to future chemical engineering students.

Whiting received his bachelor's degree from Lebanon Valley College, and a master's degree and Ph.D. from Virginia Tech.



Gary Whiting



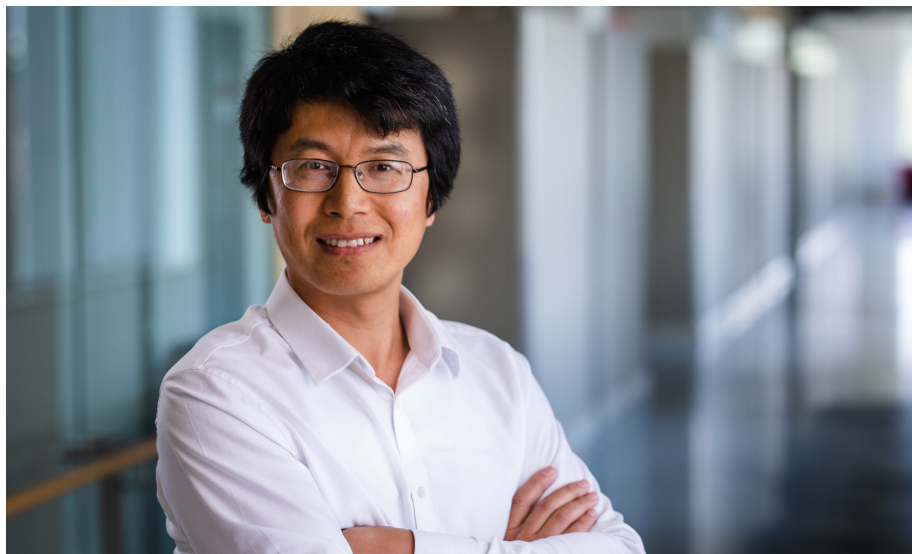
Padma Rajagopalan

Chemical engineers' paper selected American Chemical Society's editors' choice article

An article by Andrew Ford, who recently completed his Ph.D. in chemical engineering, and Professor Padma Rajagopalan, was selected as an American Chemical Society's (ACS) Editors' Choice article. This honor is given to only one article from the entire ACS portfolio each day of the year due to its potential for broad public interest.

Results from the study have implications in understanding cell migration, diseases such as cancer and fibrosis, and in normal processes such as wound healing. The study was partially supported by the National Science Foundation.

Xin receives NSF CAREER award to promote basic catalysis research and data science education



Hongliang Xin

“This grant will allow our group to pursue cutting-edge research on fundamental catalysis, while developing teaching and outreach activities that will enhance recruitment and retention of underrepresented minorities and women in STEM fields.” - Xin

Dr. Hongliang Xin, assistant professor of chemical engineering at Virginia Tech, has received a Faculty Early Career Development (CAREER) award from the National Science Foundation.

With the five-year, \$500,000 CAREER project titled “Bayesian Model of Chemisorption for Adsorbate-Specific Tuning of Electrocatalysis,” Xin plans to investigate, through quantum chemistry and data science, ways to improve the energy efficiency of electrochemical ammonia oxidation involved in ammonia sensing, wastewater treatment, and direct ammonia fuel cells. Ultimately, the research will aid the discovery of next generation energy materials for fuel cells that combine fuels and oxygen to produce electricity driving motors in fuel cell vehicles.

Xin’s strategy is to develop physical models by learning from accurate quantum-chemical simulations. This will enhance understanding of why certain materials work well as catalysts. The fundamental knowledge gained from the project will help guide the design of more efficient electrocatalysts, not only for ammonia-related applications, but also for a broad range of energy and environmental technologies.

“I am truly honored to receive the NSF CAREER award,” said Xin. “This grant will allow our group to pursue cutting-edge research on fundamental catalysis, while developing teaching and outreach activities that will enhance recruitment and retention of underrepresented minorities and women in STEM fields.”

The knowledge will bridge the gap between surface science under ultra-high vacuum conditions and electrocatalysis at solid-liquid interfaces, Xin explained.

Xin joined the Virginia Tech community in 2014. His research focuses on the integration of quantum chemistry and data science for understanding mechanisms of catalytic processes and accelerating catalyst discovery. He holds bachelor’s and master’s degrees in chemical engineering from Tianjin University and Tsinghua University in China, and a doctoral degree in chemical engineering from the University of Michigan.

Tina Russell recipient of 2019 College of Engineering Exemplary Employee Award

Chemical engineering communication and program support specialist, Tina K. Russell, was awarded the 2019 Exemplary Employee Award in the administrative category sponsored by the College Association of Staff in Engineering (CASE) for her sustained dedication and excellence of service. She received an award plaque and an award prize from the Dean of Engineering, Julie Ross, during an award luncheon on May 14.



Tina Russell

Machine-learning enables a previously-unseen look at polymers helpful in biomedical field

A team of researchers led by Dr. Sanket Deshmukh, assistant professor of chemical engineering, has developed a method to investigate the structure of polymers that are sensitive to external stimuli that was published in the *Journal of Physical Chemistry Letters*. Simulation trajectories of this computational model were analyzed by using a data-driven machine-learning method.

This research used the Cori supercomputer at the Department of Energy's National Energy Research Scientific Computing Center. Validation of the model was done at Advanced Research Computing at Virginia Tech.

At present, Deshmukh's group is utilizing the model of the thermosensitive polymer to simulate complex architectures with the goal of providing insights on the structures on individual polymer chains present in these materials, which are otherwise inaccessible with experimental techniques.



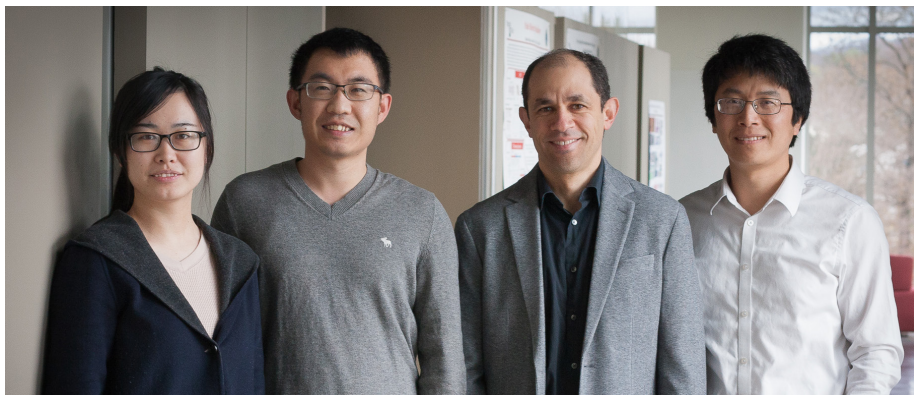
From left: Yaxin An, Karteek Bejagam, and Sanket Deshmukh.

Discovery of single atom structure leads to more efficient catalyst

Dr. Ayman M. Karim, associate professor of chemical engineering and Dr. Hongliang Xin, assistant professor of chemical engineering; have identified the structure of iridium single atom catalysts for carbon monoxide oxidation. The identification of the structure and reaction mechanism will help in the design of better and more cost-efficient catalysts. The research is funded by the Army Research Office.

Yubing Lu and Jiamin Wang, both doctoral students in the department of chemical engineering at Virginia Tech, contributed to this study. Lu led the experiments while Wang was responsible for the computational work.

Research collaborators include Simon R. Bare, distinguished staff scientist at the Stanford Synchrotron Radiation Light Source and scientists from the Pacific Northwest National Laboratory.



From left: Jiamin Wang, Yubing Lu, Ayman Karim, and Hongliang Xin.

Owens wins prestigious Goldwater Scholarship

Jim Owens is one of three rising seniors from Virginia Tech to be named a 2019 Barry Goldwater Scholar. All three are students in the Virginia Tech Honors College. The Goldwater Scholarship is the most prestigious undergraduate scholarship in natural sciences, mathematics, and engineering in the United States.

This year, the scholarship honoring Sen. Barry Goldwater was awarded to 496 students across the United States. The scholarship provides one- or two-year scholarships of up to \$7,500 to help cover costs associated with tuition, fees, books, room, and board.

“Each university can nominate up to four students for the Goldwater Scholarship, so to have three of our four nominees selected as Goldwater Scholars is notable,” said Christina McIntyre, director of professional development, national and international scholarships in the Honors College. “Since 1989, 50 Hokies have been recognized as Goldwater Scholars in the colleges of Engineering, Science, Agriculture and

Life Sciences, and Natural Resources and Environment. I believe this is a testament to the quality of undergraduate research and faculty mentorship happening at Virginia Tech.”

James “Jim” Owens plans to obtain a Ph.D. in chemical engineering with a concentration in materials science, with the goal of developing novel, low-cost materials and fabrication methods to use in energy technologies.

Owens has been involved in several internships, including one at the Massachusetts Institute of Technology, where he researched the electrochemical production of hydrogen peroxide. During his junior year, Owens spent five weeks at the University of Cape Town in South Africa, an opportunity funded by an Odyssey Fellowship through the Honors College. Owens sought to understand the relationship between policy, utilities, and their stakeholders, working in a team that researched scientific literature and conducted interviews to make recommendations for upcoming initiatives.

“The project I spent the most time working on concerned the adoption of renewable, off-grid systems in underdeveloped areas,” Owens said. Through this research opportunity, Owens learned the fundamentals of human-centered design and the economic, cultural, and political constraints that energy scientists must work through.

“Jim’s motivation to perform his particular research project revolves around his strong desire to contribute to sustainable and distributed energy,” said Dr. Michael Bortner, assistant professor of chemical engineering at Virginia Tech. “He plans to use this research to further understand technology constraints in the energy sector and how these concepts practically translate to energy infrastructure and distribution. Jim is passionate about his research, extremely energetic, and excited to pursue a research-based career that will have a significant impact on society.”

In addition, Owens received the “Best Presentation in Electrochemistry” award from Rice University for his presentation at the university’s 2018 Gulf Coast Undergraduate Research Symposium (GCURS), along with being selected as a recipient of the 2017-2018 Donald F. & Mildred Topp Othmer Scholarship Award.



Jim Owens



Mubashir Ansari

Ansari recognized with Aspire! Award

Ph.D student, Mubashir Ansari, was recognized with an Aspire! Award by the Division of Student Affairs. The Aspire! Awards were established by the Student Affairs in 2011 as a way to recognize and celebrate the Virginia Tech students who embody the Aspirations for Student Learning.

Five times a year, five students who live the Aspirations for Student Learning are honored as recipients of Aspire! Awards. The Aspire! Awards are open to students of all majors and levels of study. The Student Affairs’ Aspirations for Student Learning represent the pinnacle of Virginia Tech’s aspirations for and expectations of students. They are:

- Commit to unwavering CURIOSITY
- Pursue SELF-UNDERSTANDING and INTEGRITY
- Practice CIVILITY
- Prepare for a life of COURAGEOUS LEADERSHIP
- Embrace UT PROSIM as a way of life.

Undergraduate researcher develops new model critical in creating better devices



Preeya Achari

Chemical engineering junior Preeya Achari has developed and recently published as first author a new computational model to better understand the relationship between water and a type of two-dimensional material which is composed of one-atom-thick layers that are flat like a sheet of paper. The model will help predict the behavior of water at the surface of hexagonal boron nitride, a compound commonly used in cosmetic products such as eyeshadow, and lipstick.

Achari works in the computational lab of chemical engineering assistant professor Sanket Deshmukh. She developed the model in close collaboration with others in Deshmukh's lab, including post-doctoral researcher Karteek Bejagam and visiting scholar Samrendra Singh.

Prior to the development of the new model, understanding the molecular-level structure of water at the contact surface with hexagonal boron nitride proved very challenging, if not impossible. The development may provide more control in performance of devices made with hexagonal boron-nitride.

In addition to her recently published journal article, Achari was also awarded best oral presentation at the 2018 Materials Research Society meeting in Boston, Massachusetts.

Senior leads launch of STEM research conference

In the spring of 2019, Chemical Engineering senior, Ali Toloczko, organized and executed the first Mid-Atlantic Undergraduate Research Conference in Blacksburg with a team of 12 students. The conference, held March 23-24, involved students discussing their research and special speakers in the science, technology, engineering and mathematics (STEM) fields.

"I got the inspiration after I attended a conference at Harvard," Toloczko said. "After presenting [my research], I realized that there was a lot more to research than just going in to work on your experiment every day."

The key speakers at the conference included Kate Biberdorf, a lecturer in the Department of Chemistry at University of Tennessee Austin. She is known for breaking stereotypes of women in chemistry and research. Another speaker, Daniel Andruczyk, assistant research professor at the Center for Plasma-Material Interactions at the University of Illinois, discussed his plasma physics and fusion research.



Ali Toloczko

Doctoral student shares knowledge of 3D printing with next generation scientists and engineers



Jake Fallon

In December 2018, Jake Fallon volunteered his time to demonstrate the unique and fascinating capabilities of 3D printing technology by designing, 3D printing, and shipping a customized tree ornament for the children to have at the Carlsbad Boys and Girls Club in Carlsbad, CA.

Fallon hopes to eventually sponsor the club with a 3D printer so that the children can gain hands-on experience and to help further engage their interest in STEM. "This would also be a great way for some of the boys and girls who are interested in computer aided modeling to make some of their designs come to life," said Fallon. "It is an extremely rewarding experience to help share 3D printing technology with the next generation of scientists and engineers."

Fallon is advised by assistant professor Michael Bortner and is a member of the Polymer Composite and Materials Lab in the Department of Chemical Engineering at Virginia Tech.

Graduating senior works well under pressure

Outside of the classroom, Mary McCorkill, a senior majoring in chemical engineering, could be found in the Supercritical Fluids Lab at Virginia Tech, operating novel high-pressure equipment to determine the way materials behave as a function of temperature and pressure. Her undergraduate research, a project funded by the National Science Foundation, has been focused on understanding the behavior of ionic liquids and their mixtures at pressures up to 6000 psi.

Ionic liquids are molten salts that are being explored as future-generation sustainable solvents in chemical processes and in energy-storage devices, such as batteries. McCorkill generates valuable data on how these materials will behave in chemical processes at elevated temperatures and pressures.

“The most important thing I have gained through working in the lab is seeing how the concepts we learn throughout our chemical engineering coursework can be practically applied,” McCorkill said.

McCorkill joined the Supercritical Fluids Lab directed by Professor Erdogan Kiran the summer of her sophomore year after taking Kiran’s Thermodynamics course in the Department of Chemical Engineering. She remained in the lab throughout the rest of her time at Virginia Tech citing the “invaluable experience of working with and learning from [her] research team.”

“Having Mary in the lab is like having another graduate student. She is here every day performing experiments and reading publications, and she is currently working on a first-authored publication,” said James Dickmann, a chemical engineering Ph.D. candidate and her mentor in the lab. “We spent the last year together synthesizing our own ionic liquids because we were not able to find a supplier, and Mary really took the lead performing all of the reactions.”

During her time as an undergraduate researcher, she has contributed significantly to the field of high-pressure research as a co-author on two publications related to the understanding of ionic liquids and their mixtures.

McCorkill was also acknowledged for her contributions in two additional publications on polymer modifications with supercritical carbon dioxide. She presented a portion of her work at the 17th European Meeting on Supercritical Fluids and the seventh European Meeting on High Pressure Technology in April 2019 in Ciudad Real, Spain.

She was recently awarded the Virginia Blue Ridge Section of the American Chemical Society’s James Lewis Howe Award, which recognizes outstanding achievements by college seniors in chemistry-related areas. After graduation, she joined NanoSonic in Pembroke, Virginia, as a research scientist – a career path she says was inspired by her time as an undergraduate researcher at Virginia Tech.



Mary McCorkill

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS STUDENT CHAPTER AT VIRGINIA TECH

Host of 2020 AIChE Mid-Atlantic Regional Student Conference

Squares Student Center, Virginia Tech campus

Chem-e-car team wins regional competition

The Virginia Tech Chem-E-Car team placed first in this year's Chem-E-Car competition at the 2019 Mid Atlantic Regional American Institute of Chemical Engineers (AIChE) Student Conference at Pennsylvania State University.

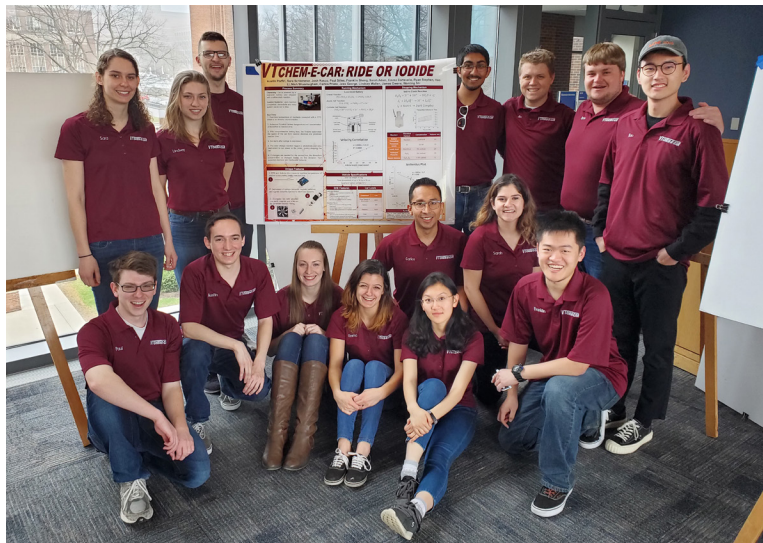
The competition tests a team's ability to design and construct a shoebox-sized car powered by a chemical energy source that safely carries a specified load to a target distance and stops via the direct control of a chemical reaction.

The Virginia Tech team this year focused on designing a completely new drive system for the car. Despite the challenge, a sophisticated on-board computer and expert knowledge of chemistry to power and stop the car propelled this team to victory.

This is the team's sixth consecutive top five finish at the regional competition, this year competing against 21 other cars from other universities. The finish qualifies the team for the national competition in the fall in Orlando, Florida.

The first place finish at the regional event is the second in the team's history, following the first in 2014. Virginia Tech's team consists of chemical engineering undergraduate students, including three seniors: team leader Austin Porfiri, Wenting Shi, and Hao Li; and twelve juniors: Sara Schlemmer, Josh Rasco, Paul Stiles, Franklin Sheng, Emma Darteville, Sarah Adam, Ryan Stephen, Nish Shanmugham, Lindsey Wallen, Carlos Prieto, Jess George, and Jim Owens. Their faculty advisor is Gary Whiting, Joseph H. Collie Professor in the Virginia Tech Department of Chemical Engineering.

The team thanks the generous financial support of Virginia Tech alumnus Steve Cope of ExxonMobil and the Student Engineers' Council. The team also wishes to thank the staff in the Department of Chemical Engineering for administrative and technical support.



2018-2019 Chem-E-Car Team



Thomas Bobcock, Hailey Bain, Brian Boreford, Travis Bean, Benjamin Behardt, Joey Brockwell

Chemical Engineering



Henry Bui, Heather Burham, Tammy Burns, Naomi Butler Abror, Rachel Bjers, Gabrielle Cardenas



Brian Carroll, Zachary Chew, Madeline Creeshaw, Brian Curtin, Alexandria Dabich, Marissa Dawey, Tucker Davis



Kathy Deng, Erin Dharia, Blackl Dillon, Darson England, Cole Estleck, Jordan Estep, Connor Farrell

Class of 2019

Jeff Hofmann Photography
Roanoke, VA



Paul Faust, Charles Ferrell, Scott Friedman, Taylor Frotz, Melli Garfo, Alexis Gillmore, Caleb Griffin, David Guckian



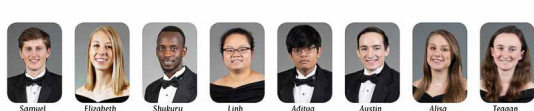
Joey Gullfoyle, Abigail Gullemart, Kevin Hall, Julia Hilden, Jake Hodges, Jesse Hong, Jon Hosteler, Qingqing Hou



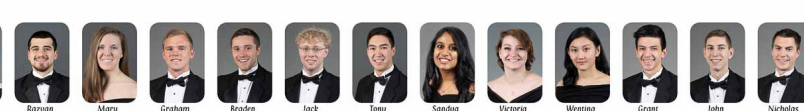
McKenzie Hutchison, Blake Izzo, Mason Kaplanski, Rhett Kiser, Varun Kumar, Ligne Lancesster, Hao Li, Nicholas Lombardy, James Luo, Hunter Mainzer, Zachary Maners, Alexandra Marrot, Emily Marx, Adair Maynard, Glenn McCall, Rachel McCarthy, Mary McCorbill, Alexandre Mello, Karl Mittmann, Carly Nolen



Samuel Odey, Elizabeth Parridge, Shauna Pascal, Linh Pham, Aditya Potukumari, Jason Porfiri, Alisa Pratt, Tragan Pugh, Rajman Rada, Mary Ramey, Graham Rich, Brenden Ricks, Jack Rizek, Tony Rogers, Sandya Soripolla, Victoria Schlusos, Wenting Shi, Grant Smith, John Sneed, Nicholas Snodgrass



Emma Sparks, Joshua Spence, Marilee Spence, Rosalie Stobe, Andrea Surett, Adriana Thomas, Aru Tiwari, Alexandra Tolozco, Nathalie Unico, Clay Viar, Matthew Wagner, Wan Zuhailho Afqah, Wan Zaki, Jordani Warts, Brenden Walber, Christopher Wu, Xuanzhen Yuan, Dingqi Zhang, Zichen Zhu, Faizal Zulkifli



Henry Bui, Heather Burham, Tammy Burns, Naomi Butler Abror, Rachel Bjers, Gabrielle Cardenas, Kathy Deng, Erin Dharia, Blackl Dillon, Darson England, Cole Estleck, Jordan Estep, Connor Farrell, Joey Gullfoyle, Abigail Gullemart, Kevin Hall, Julia Hilden, Jake Hodges, Jesse Hong, Jon Hosteler, Qingqing Hou, McKenzie Hutchison, Blake Izzo, Mason Kaplanski, Rhett Kiser, Varun Kumar, Ligne Lancesster, Hao Li, Nicholas Lombardy, James Luo, Hunter Mainzer, Zachary Maners, Alexandra Marrot, Emily Marx, Adair Maynard, Glenn McCall, Rachel McCarthy, Mary McCorbill, Alexandre Mello, Karl Mittmann, Carly Nolen, Samuel Odey, Elizabeth Parridge, Shauna Pascal, Linh Pham, Aditya Potukumari, Jason Porfiri, Alisa Pratt, Tragan Pugh, Rajman Rada, Mary Ramey, Graham Rich, Brenden Ricks, Jack Rizek, Tony Rogers, Sandya Soripolla, Victoria Schlusos, Wenting Shi, Grant Smith, John Sneed, Nicholas Snodgrass, Emma Sparks, Joshua Spence, Marilee Spence, Rosalie Stobe, Andrea Surett, Adriana Thomas, Aru Tiwari, Alexandra Tolozco, Nathalie Unico, Clay Viar, Matthew Wagner, Wan Zuhailho Afqah, Wan Zaki, Jordani Warts, Brenden Walber, Christopher Wu, Xuanzhen Yuan, Dingqi Zhang, Zichen Zhu, Faizal Zulkifli

BACHELOR, MASTER, AND DOCTORAL DEGREES AWARDED

The department awarded 102 bachelors degrees during the spring 2018 commencement. The department also awarded the following masters and Ph.D. degrees over the past year.

Master of Engineering Non-Thesis

Chen, Han

Advisor: David Cox

Deng, Chengyu

Advisor: Chang Lu

Gadalla, Dina

Advisor: Aaron Goldstein

Gilmer, Eric

Advisor: Mike Bortner

Huang, Yihong

Advisor: Rong Tong

Lee, Youngju

Advisor: David Cox

Wang, Siwen

Advisor: Hongliang Xin

Master of Science

Chan, Kathleen

Investigation of Processing Conditions and Viscoelastic Properties on Frictional Sliding Behavior of Unidirectional Carbon Fiber Prepreg
Advisor: Mike Bortner

Zhang, Qiaoyi (April)

The Synthesis and Characterization of Sodium Polysulfides for Na-S Battery Application
Co-Advisors: Zheng Li (ME) and Hongliang Xin

Zhang, Xiwen

Structure Sensitivity of Alkane Hydrogenolysis Reactions on Ir/MgAl₂O₄/Catalysts
Advisor: Ayman Karim

ANSARI, Mubashir

Generation of Thermotropic Liquid Crystalline Polymer (TLCP)-Thermoplastic Composite Filaments and Their Processing in Fused Filament Fabrication (FFF)
Advisor: Don Baird

CHEN, Hongyu

Experimental Evaluation of Fiber Length Distribution and Modeling of Fiber Orientation and Elastic Properties for Long Glass Fiber Reinforced Thermoplastics
Advisor: Don Baird

DICKMANN, JAMES

Volumetric Properties and Viscosity of Fluid Mixtures at High Pressures: Lubricants and Ionic Liquids
Advisor: Erdogan Kiran

FORD, Andrew

Investigating the Interplay between Inflammation and Matrix Stiffness: Evaluation of Cell Phenotype and Cytoplasmic Stiffness In Vitro
Advisor: Padma Rajagopalan

JO, Ami

The Design of Biodegradable Polyester Nanocarriers for Image-Guided Therapeutic Delivery
Advisor: Richey Davis

Ph.D.

LAMBERT, Gregory

Using Non-Lubricated Squeeze Flow to Obtain Empirical Parameters for Modeling the Injection Molding of Long-Fiber Composites
Advisor: Don Baird

LI, Wenhui

Connecting Thermodynamics and Kinetics of Ligand Controlled Colloidal Pd Nanoparticle Synthesis
Advisor: Ayman Karim

Lu, Yubing

Structural and Kinetic Study of Low Temperature Oxidation Reactions on Noble Metal Single Atoms and Subnanometer Clusters
Advisor: Ayman Karim

MURPHY, Travis

Microfluidic Tools for Molecular Analysis and Engineering
Advisor: Chang Lu

SARMA, Mimosa

Microfluidic Platforms for Transcriptomics and Epigenomics
Advisor: Chang Lu

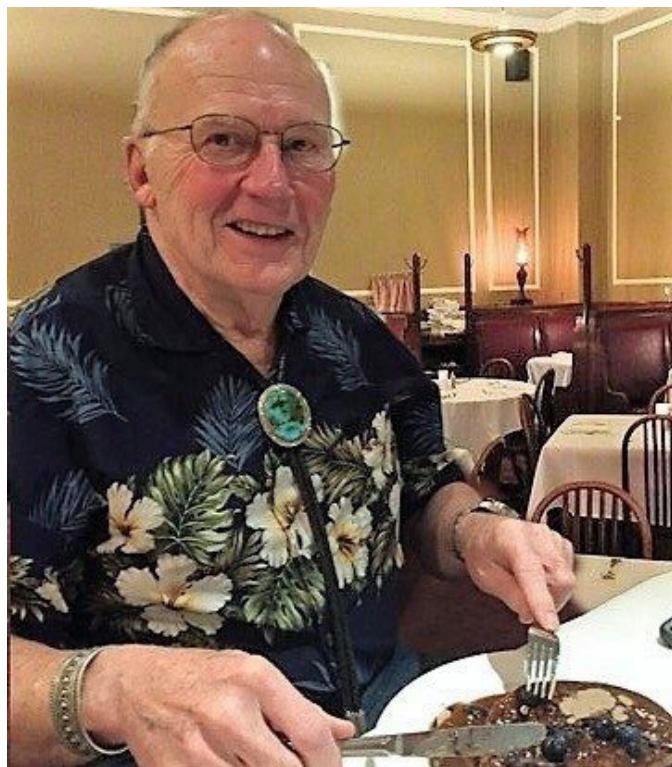
YU, Jianger

Establishing the Conditions for Stable Extrusion of Melt Spun Polyacrylonitrile with Water Based Plasticizers
Advisor: Don Baird

IN MEMORIAM >

William L. (Bill) Conger

An outstanding educator,
patient and enthusiastic.



William L. (Bill) Conger, former department head and Professor Emeritus of Chemical Engineering passed away July 26 at the age of 82 in his home surrounded by his family.

Conger received his B.S. from the University of Louisville and his Ph.D. from the University of Pennsylvania. He began his career at Esso before joining the faculty at the University of Kentucky. In 1983 he moved to Virginia Tech and was appointed Professor and Department Head of Chemical Engineering. He served on the Virginia Tech faculty for 19 years before his retirement and move to Estes Park, CO.

Bill was an outstanding teacher and a winner of the Sporn Award for Excellence in Teaching Engineering Subjects at Virginia Tech. He was fiercely dedicated to his students, and remembered by them for his patience and enthusiasm in teaching the introductory chemical engineering course in mass and energy balances and the course in separations.

He is remembered by his colleagues for his love of the outdoors, hunting, fishing and everything related to scouting. The young faculty that he hired appreciated and admired him for the tireless support and mentoring that he provided.





1991

Caroline McClean Holtzman. (BS)

Other degree: MS in Systems Engineering, 1997
 Caroline is a thermal apparel technical leader for DuPont. She lives in Midlothian, Virginia and can be reached at caroline.m.holtzman@dupont.

2013

Noah Belkhaty (BS)
 Other degree: MS in Electrophysiology, VCU
 Noah is currently a student at Edward Via College of Osteopathic Medicine (VCOM) and hopes to graduate in 2022. He lives in Blacksburg and can be reached at nbelkhaty@vcom.vt.edu.

2016

Max Tarshis (BS)
 Max works in production engineering at Honeywell and his email address is mtarshis06@gmail.com.

2018

David Rivera (BS)
 David works at Merck as an associate specialist for operations. He is helping Merck to start up a new process in the next few months. He lives in Lexington, Virginia and can be reached at david5@vt.edu.



2nd Annual Giving Day

Virginia Tech held its 2nd Annual Giving Day beginning at noon on March 19th, ending at noon on March 20th, 2019. Giving Day is a much-advertised web-based fund drive that provides opportunities for giving to different organizations on campus. For 2019, 72 donors worked their way through the different menus to donate directly to Chemical Engineering, nearly double the number that gave in 2018! Many of these were first time donors. Thank you to all of our alumni, friends, students, faculty and staff that participated!

Special thank you goes out to our alumni, students and staff that served as Giving Day Ambassadors: John Hillenbrand, Mike Kender, Chris McDowell, Tony Rogers and Tina Russell.

The department gratefully acknowledges the following individuals for their support during 2018-2019.

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Bailee J. Yarbrough
Joseph and Diane Zier
Stephen G. Zimmermann

Giving to Chemical Engineering

One of the primary reasons for the department's continued success is the generous support of our alumni and friends. Your contributions provide funds for scholarships and travel for our undergraduate students, fellowships for our graduate students, and support for activities such as our external seminar program that brings outstanding speakers from other institutions here to Virginia Tech to interact with our faculty and students. Your continued support is vital to our goal of becoming one of the top chemical engineering programs in the country.

To make it as easy for you as possible to support our department, we have added a link on our homepage (www.che.vt.edu) that will direct you to a form for making a gift online. The link is entitled "Giving to ChE" and can be found on the upper right hand side of the page. The page describes the method for designating your gift for the Chemical Engineering Department. If your selected fund is "Chemical Engineering Department Annual Fund", you can be assured that your support will go directly to ChE.



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WE WANT TO HEAR FROM YOU!

The Chemical Engineering Department is always interested in hearing from its alumni. Please take a few minutes to complete the following:

Full Name: _____ Name while at Virginia Tech (if different) _____

Degree received at Virginia Tech / year: _____

Other degrees / Institutions: _____

Home Address: _____

Phone: _____ Fax: _____ E-mail: _____

Business Name: _____

Current Position / Title: _____

Please feel free to provide any additional information (on separate piece of paper if needed) about yourself or your career: _____

The Department of Chemical Engineering would like to keep our alumni updated about the careers and lives of other alumni, either via the web or the department newsletter. However, we also respect each person's right to privacy. Thus, please indicate below the level of confidentiality that you wish us to maintain with regard to your information:

- ___ Feel free to make all information provide on this form public.
- ___ Feel free to publish my name, year of graduation, and contact information only (the additional information about yourself or career will be kept confidential).
- ___ Feel free to publish my name, year of graduation, and the additional information about myself (your contact information will be kept confidential).
- ___ Do not publish any information about me.
- ___ Other, please explain on a separate sheet of paper.

Please mail the completed form to:
Chemical Engineering Department
 c/o Ms. Jane Price
 245 Goodwin Hall (MC 0211)
 635 Prices Fork Road
 Blacksburg, Virginia 24061

or by e-mail at: jsprice@vt.edu