

CHEM-E NEWS

CHEMICAL ENGINEERING

SUMMER 2018

COLLEGE OF ENGINEERING



KANSAS STATE
UNIVERSITY

FROM THE DEPARTMENT HEAD



I am so very pleased to announce our new name, the Tim Taylor Department of Chemical Engineering. The endowment from Tim and Sharon Taylor's generous donation to the department will ensure that we continue to offer outstanding training and opportunities to our students. These funds will help us to hire and retain faculty who are dedicated and inspiring teachers, and world-renowned researchers. Our students will become leaders in their professions through

the mentoring they receive from our faculty. I greatly appreciate this foresighted investment in the future from the Taylors, as well as the confidence they have placed in the department.

Two new faculty will be starting in the department this fall. Won Min Park joins as an assistant professor. He will be developing biological reactions to create protein-based nanostructures with controlled sizes, shapes and chemical properties for his research.

Its potential applications include biosensors, bio-imaging and biomolecular computing. Park will be teaching Thermodynamics I this fall. M. Helal Uddin is joining as a teaching assistant professor. He is coming from the University of Minnesota, Duluth, where he held a postdoctoral appointment. Besides holding a Ph.D., he also worked for four years as a process engineer, and will bring a good combination of both academic and practical chemical engineering experience. He will be teaching Health and Safety in chemical engineering, and the Materials Science and Engineering courses this fall. We are planning to start searches for additional faculty soon.

Through their hard work, the department's students, faculty and staff received several awards this year, as you can read about in this newsletter.

Faculty and students continue to enthusiastically pursue their research. Ongoing projects include developing new semiconductor materials, carbon nanotubes for photocatalytic air purification, catalysis to convert biomass to fuels, studies of plant root-associated bacterial communities and developing new processes for the production of ammonia. These projects will help society by improving the environment and food production, creating new energy sources, and developing new, more sensitive and versatile electronic sensors.

We appreciate hearing from our alumni. Send us an email to let us know how you are doing.

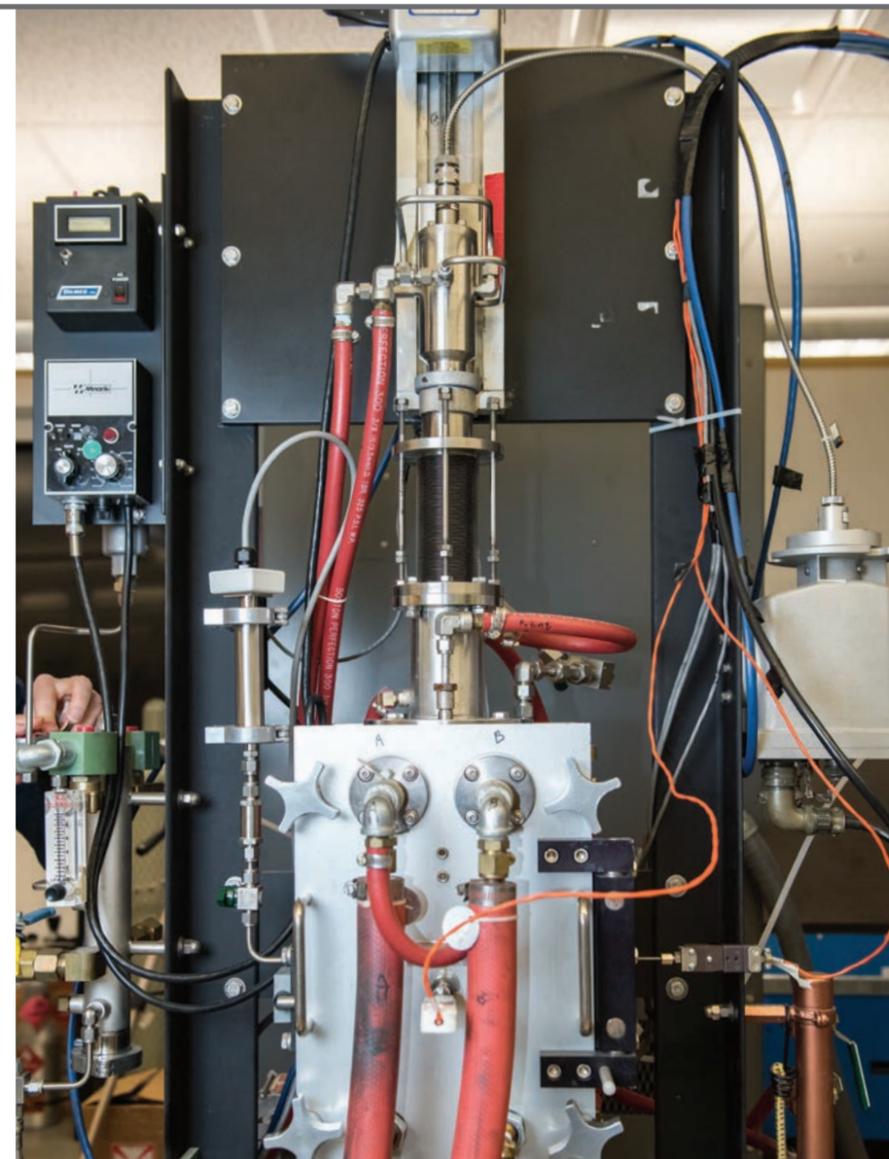
James H. Edgar
University Distinguished Professor and Department Head
Tom H. Barrett University Faculty Chair
Chemical Engineering

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ON THE COVER
TIM TAYLOR VISITS WITH K-STATE ALUM, SHAQUAN WHITE.

LEFT
ULTRA-HIGH-TEMPERATURE FURNACE IN THE CHEMICAL ENGINEERING RESEARCH LABORATORY OF J.H. EDGAR

CHEM-E NEWS

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GIVING BACK WITH AN EYE TO THE FUTURE

TIM AND SHARON TAYLOR GIVE TO NAME THE TIM TAYLOR DEPARTMENT OF CHEMICAL ENGINEERING

With an eye to the future, Tim Taylor and his wife, Sharon, have made a significant investment in the College of Engineering at Kansas State University, naming the Tim Taylor Department of Chemical Engineering. This investment will empower the department to recruit and retain top faculty, and the best students, by providing flexible funding for department leaders to take advantage of emerging opportunities.



TIM AND SHARON TAYLOR

Tim Taylor received his degree in chemical engineering from K-State in 1975. He served on the Engineering Advisory Council, received the Engineering Distinguished Service Award and was inducted into the College of Engineering Hall of Fame. He also serves on the College of Engineering's Innovation and Inspiration Campaign steering committee.

"I think there are three things that make a good educational opportunity — students, faculty and facilities," Tim said. "I hope with this gift, we're able to address all three of those, because in the end, it's really the quality of those three things that determine success."

The Taylors appreciate the foundation Tim received at K-State, inspiring them to give back, but the future success of students and the college is what they really value.

"The real reward in giving back to our university is watching our students continue to develop and grow," Tim said. "I believe the future of these students who come out of chemical engineering and other parts of the university are just going to be critical to recognizing the potential that exists in the world. That is the most rewarding aspect."

"The real reward in giving back to our university is watching our students continue to develop and grow."

— Tim Taylor '75

"I've had a very fortunate career in the energy sector, but it was built on the foundation of the education I received at K-State in chemical engineering," Tim said. "Because of that, I'm in the position to contribute back to the university. I think it's important to help current and future students enjoy the same types of opportunities I had."

INDUSTRY IMPACTS SENIOR DESIGN EXPERIENCE

by Keith L. Hohn and Jennifer Anthony

In senior design, students use their engineering knowledge to design a practical system. No longer are calculations simple with a single right answer. Instead, students attack an ill-defined problem, requiring them to learn about ideas not found in textbooks and to make informed assumptions to achieve a practical solution. In short, they have to think like practicing engineers.

In the spring 2018 semester, representatives from industry helped students by submitting five design projects from DowDupont, Koch Industries, Burns & McDonnell, Weiss Associates and GreatPoint Energy Inc.

Matthew Schoeder, from Koch Fertilizer Beatrice LLC, commented on his experience: "I enjoyed working with the senior design class this year on a practical problem. Thank you to the department of chemical engineering for allowing us to work with your students and I hope we can continue to work with them next year."

Through a collaboration with Cargill, industry also provided process safety coaching to the design teams. Each team was assigned a Cargill engineer who provided guidance on how to incorporate appropriate safety measures into its design. Each student interacted with the Cargill coaches through three sessions, all of which were done online.

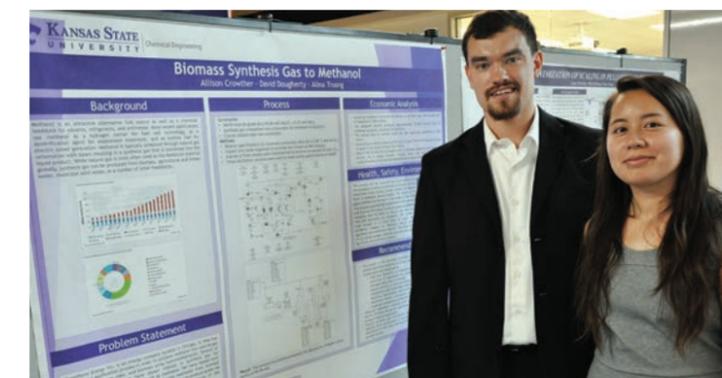
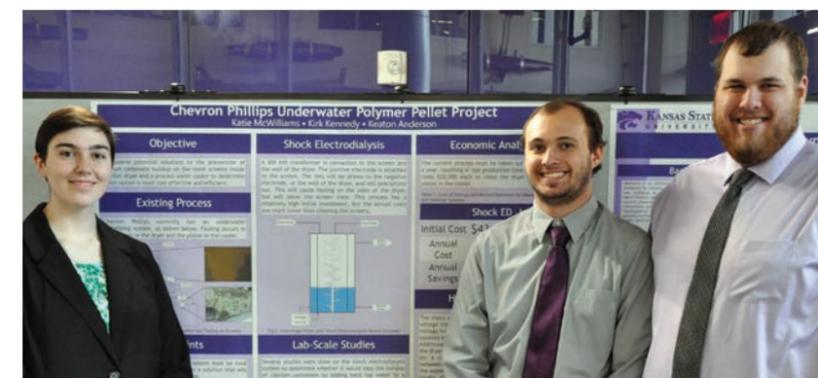
In the first session, coaches and the coaching plan were introduced. In the second session, each design team met with its coach to talk about hazards and inherently safer design. Design teams talked with their industrial coaches about the chemicals used in their process and their hazards. In the final session, conducted after the design teams had completed their flowsheet, and a mass and energy balance around each process unit, each team engaged in process hazard analysis with coaching from the Cargill mentor. Through these activities, students were able to thoroughly consider the process hazards associated with their processes and ensure that their design contained appropriate safety features to mitigate these hazards.

Industrial input into the senior design experience has been extremely valuable for chemical engineering students, and the department wishes to sincerely thank the companies who contributed.

Industrial projects used in spring 2018 senior design class

Company	Project Title
Burns & McDonnell	Synthetic lube oil base stock from linear alpha olefin monomer feed
DowDupont	Ethane to vinyl
Koch Industries	Scrubbing system for anhydrous ammonia
Weiss Associates	Environmental remediation of a contaminated site
GreatPoint Energy Inc.	Biomass syngas to methanol

BELOW LEFT, KATIE MCWILLIAMS, KIRK KENNEDY AND KEATON ANDERSON DISPLAY A CHEVRON PHILLIPS PROJECT ON UNDERWATER POLYMER. BELOW, DAVID DOUGHERTY AND ALINA TRUONG SHOW A DESIGN PROJECT ON PRODUCTION OF METHANOL FROM BIOMASS.





CHEMICAL ENGINEERING WINS OUTSTANDING DEPARTMENT AWARD

The chemical engineering department was named the **2018 Outstanding Department** for Open House this year, which involved scoring well in all major categories of the annual event. Three students — Eli Janzen, Christopher Mattson and Sarah Featherstone — received the David and Virginia Braun Innovation Award for their display on papermaking, “The Alchemy of Scroll-Making.” The department’s skit, “Adventures in Alchemy,” won second place. The combined scores for these and other activities gave CHE the edge over the other departments. Faculty advisers were Sigifredo Castro Diaz, Andrew Duncan and Brian Tande.



THE FOUR DRAGONS: INEFFICIENCY, CONTAMINATION, EMISSIONS AND DISEASE

OPEN HOUSE 2018



BERNADETTE DRUOUHARD RAISES HER STAFF OF ENVIRONMENTAL ALCHEMY.



CHE STUDENTS INVOLVED WITH OPEN HOUSE

NEW FACULTY WON MIN PARK

Won Min Park will join the CHE department as an assistant professor this fall. Park earned his Ph.D. from Georgia Tech, his M.S. from the Korea Advanced Institute of Science and Technology, and his B.S. from Hanyang University, all in chemical engineering. Prior to coming to K-State, he had been a postdoctoral associate in the department of biology at MIT.

Park will be starting a research program to develop protein nanomaterials that display novel properties. Using proteins as primary building blocks, his group will create precisely controlled nano-structural features that are correlated with the specific properties needed for biological and biomedical applications. The group will develop protein nanomaterials in three categories: nanoscale shapes and

patterns, enzyme-packaging nanocages and complex hybrid nanostructures. These protein nanomaterials will be designed to display nano-topological, biocatalytic or optical properties for applications such as biosensing, nanomedicine or bio-imaging. A modular strategy will be adopted to design recombinant, fusion protein-building blocks that are programmed to self-assemble with control over materials’ properties. In the systematic design, protein orientations, interactions and spatial organization toward programmed assembly will be investigated and optimized by integrated computational modeling and experimental characterization.



M. HELAL UDDIN

M. Helal Uddin will join the CHE department this fall as a teaching assistant professor. He earned his B.S. from Bangladesh University of Engineering and Technology in 2007, followed by his M.S. and Ph.D. in 2013 and 2016, respectively, from the University of Nevada, Reno, all in chemical engineering. In graduate school, Uddin was focused on experimental research on thermochemical conversion of waste biomasses into feasible renewable energy sources, as well as computational thermochemical conversion of waste biomasses into feasible renewable energy sources, as well as computational looping combustion technology.



Before coming to K-State, Uddin was a postdoctoral associate in the mechanical and industrial engineering department at the University of Minnesota, Duluth, focusing on designing, modeling and testing a cavity solar reactor for thermochemical conversion processes. Before starting his graduate study, he also worked for four years as a process engineer in the chemical manufacturing and petroleum processing industry. He has experience teaching fluid mechanics, transport phenomena and process control. At K-State, he will be teaching the Materials Science and Engineering courses, Health and Safety, and the Chemical Engineering Unit Operations Laboratory.



PROFESSOR CITED FOR TEACHING AND RESEARCH

HOHN NAMED COFFMAN CHAIR

Keith Hohn has been named the Coffman Chair for University Distinguished Teaching Scholars in 2018-19. This university award recognizes a faculty



member for outstanding undergraduate education, and empowers this person to advance the interests of undergraduate teaching and learning at K-State during the year in residence.

During his year as Coffman Chair, Hohn will study and catalog how faculty in professional programs — those in which a college degree is required to gain basic career entry in a specific occupational field — impart the skills their students need to succeed as professionals. He will search for commonalities between disciplines as well as differences.

“While in some cases techniques used by a particular discipline are unique to that discipline, it is likely there are some commonalities between the approaches,” Hohn said. “It may be possible for educators in chemical engineering, for example, to learn from faculty in journalism on how to prepare students for the professional world.”

For his project, Hohn will develop a survey to be sent to faculty in the university’s professional programs to find out more about each program, the profession its students will work in and the educational activities used to prepare students for the profession.

“The survey will also find out about specific techniques such as guest speakers, practicums and internships, lab work, and mentoring used in the programs,” Hohn said. “Along with this survey, I will meet individually with faculty from the programs to get more details about their teaching approaches and to observe firsthand how they implement these approaches with students.”

The outcome of Hohn’s work will be an in-depth understanding of the educational practices of professional programs through the quantitative and qualitative data collected. He will share his findings with the K-State community at workshops at the end of the academic year.

HOHN AWARDED FRANKENHOFF OUTSTANDING RESEARCH AWARD

Keith Hohn has been awarded the Frankenhoff Outstanding Research Award, an award given in the K-State College of Engineering to recognize exceptional research accomplishments during the past five years. The award recognizes Hohn’s significant research accomplishments in the area of heterogeneous catalysis for energy applications, and in particular, use of heterogeneous catalysis to convert biomass-derived compounds to fuels and chemicals.

Over the past five years, Hohn has obtained more than \$1.74 million in funding from government and industrial sources as the principal investigator or co-principal investigator. This funding has come from a variety of sources, including the National Science Foundation, Department of Defense, American Chemical Society-Petroleum Research Fund, Pipeline Research Consortium Internationale and Invista, a major polymer company. He has published 21 peer-reviewed articles and made 17

presentations at regional, national and international meetings since 2013. Hohn has been invited to present his research at a variety of venues — Invista, PRCI Technical Meeting, University of Lille, France; Catholic University of Louvain, Belgium; Karlsruhe Institute of Technology, Germany; Katholieke Universiteit – Leuven, Belgium; and the University of Missouri. He has recently submitted two patent applications on his work to convert biomass-derived compounds to butene and higher hydrocarbons.

ANTHONY RECOGNIZED FOR TEACHING EXCELLENCE



Jennifer Anthony, CHE associate professor, has received two awards in recognition of her teaching. She was named the 2018 College of Engineering James L. Hollis Awardee for Excellence in Undergraduate Teaching, presented to nominated faculty who demonstrate innovation in course development and classroom instruction, are well-respected by students and colleagues, and demonstrate competence and enthusiasm for instruction. Anthony excels in all of these aspects, making it a priority to incorporate elements of process safety in all of the chemical engineering courses she teaches. Not only is she an effective teacher, but through her mentorship has helped to improve the instruction of other faculty in the chemical engineering department.

In support of her nomination a student wrote: “Dr. Anthony is simply

a phenomenal instructor. Through our experience in her class and other skills she has passed along to us, we are getting the best possible chance to become successful engineers.”

Anthony was also named a university-wide coordinator in the Peer Review of Teaching Program, with the objective to help faculty members develop and document their teaching. It is designed to support faculty in the development of a community of scholars who write about the intellectual work involved in teaching and who share that writing with interested colleagues.

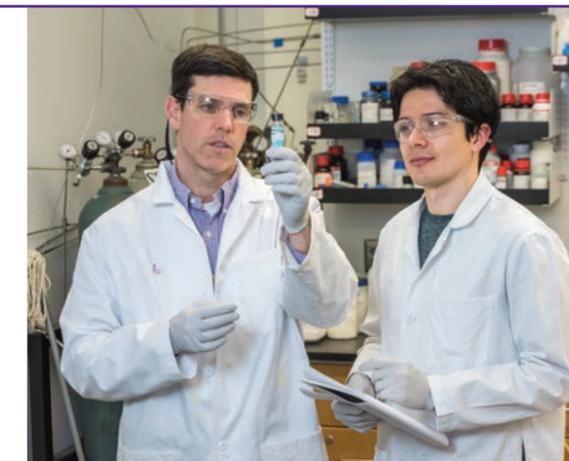
Program director, Jana Fallin, said, “We are so glad Jennifer has accepted our coordinator position for PEER Review of Teaching. Her resume was quite impressive and I know she is going to move this program forward.”

Hohn has been active in the catalysis community, providing leadership as the founding editor-in-chief of *Catalysts* (mdpi.com/journal/catalysts), an open-source journal on catalysis that is rapidly gaining an international reputation. He has also worked to establish a regional catalysis society, the Great Plains Catalysis Society (greatplainscatalysis.org), and currently serves as its president.

“I am honored to receive the Frankenhoff Outstanding Research

Award in recognition of my research accomplishments,” Hohn said, “especially in light of the outstanding past winners. I greatly enjoy studying heterogeneous catalysis and look forward to continuing to make an impact through my research.”

KEITH HOHN, LEFT, AND PH.D. CANDIDATE, LEONARDO GARRO-MENA, DISCUSS THEIR RESEARCH.





HANSEN RECIPIENT OF RESEARCH AND EXCELLENCE AWARDS

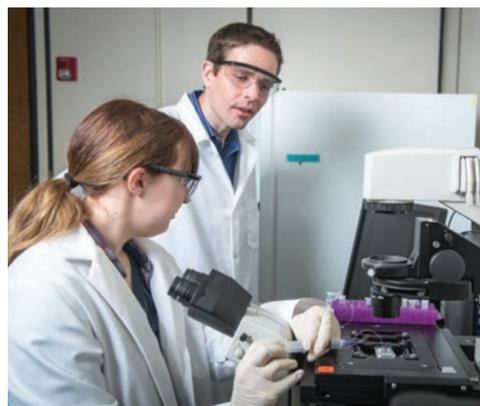
KEYSTONE RESEARCH FACULTY SCHOLAR



Ryan Hansen, CHE assistant professor, has been named a Steve Hsu Keystone Research Scholar by the K-State College of Engineering. This award, named after Steve Hsu, M.S., ME '59, was established to recruit and retain top scholars in the early stages of their careers who are in high demand for faculty positions throughout the U.S.

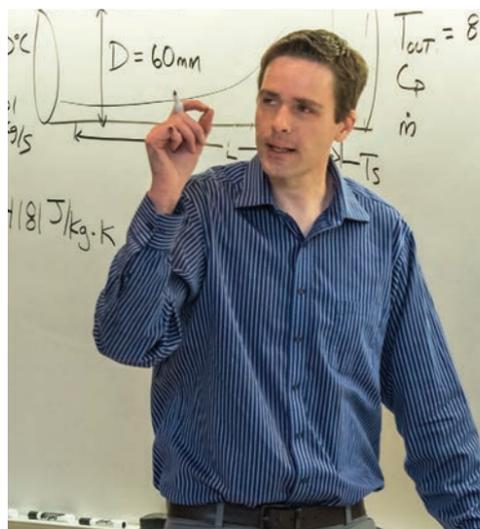
Since starting at K-State in August 2015, Hansen has established an active research group with three Ph.D. candidates, four undergraduate students and a postdoctoral appointee. He is recipient of research grants from the National Science Foundation and the Department of Energy for his research on biological interfaces.

Having previous records of outstanding research accomplishment, faculty members are nominated by their department head for this position. Each Keystone Research Faculty Scholar receives a three-year appointment with a salary supplement, and discretionary funds to



support travel, specialized equipment, and additional graduate students to join his or her research team.

Hansen is the lead PI on an NSF CBET award with Prathap Parameswaran, CE, for work on anaerobic membrane bioreactors. He and four other K-State faculty collaborators also received a research award from the National Science Foundation for a project on sustainable biosensor integration for precision management of agricultural soils.



"Dr. Hansen has always stood out to me as an exceptional educator and mentor. His interest in his students' futures is one of the ways he exceeds the expectations of an ordinary professor."

"Though his coursework is challenging, most students would say they learned more in Transport I and II than in any other class, mostly due to Dr. Hansen's excellent instruction. He is one of the best professors in the college."

ABOVE RIGHT, HANSEN WORKS WITH CHE SENIOR, AUDREY ANDERSON. RIGHT, HANSEN OFFERS CLASSROOM INSTRUCTION.

2018 FACULTY EXCELLENCE AWARDEE

Assistant professor of chemical engineering, Ryan Hansen, received the 2018 Faculty Excellence Award, which was established by alumni of the program to honor those faculty who are inspiring and who help students reach their full potential. The award also helps retain faculty by making sure they know their hard work is recognized and appreciated. Students nominating Hansen were enthusiastic about his teaching with the following comments:

WINKS: PROFESSIONAL PROGRESS AWARDEE

The Kansas State University College of Engineering honored 10 alumni for professional career accomplishment during the first 20 years following their graduation at ceremonies April 21.

Recipients of the Professional Progress Award were nominated by their respective department heads and confirmed by Darren Dawson, dean of engineering.

Laura Winks, Houston, Texas, CHE's 2018 awardee, is a 1999 graduate of K-State in chemical engineering. She is the global basic chemicals financial planning manager in the Chemical Company at the ExxonMobil Houston campus. She began her career with Exxon at the Baytown Chemical Plant, holding multiple positions in technical, business coordination, turnarounds/projects and maintenance. In 2004, Winks joined the Edison, New Jersey, plant in support of lubricant-base stock production, relocating back to Houston in 2006 into several sales and marketing positions within the intermediates and synthetics organization. She had most recently served as the Americas' polyethylene product manager.

Winks supports the advancement of women in engineering at ExxonMobil through the Chemical Company women's leadership team and serves as a mentor in the Houston campus women's interest network. She has led the Chemical Company's efforts in recruiting engineering graduates from K-State and has served on the advisory committee for the chemical engineering department.



I spent the first seven years in chemical manufacturing sites doing process technical support. I then moved into the business side of chemicals and have grown into positions in sales, marketing, planning and regulatory affairs for a majority of ExxonMobil Chemical Company products. I enjoy the business side of the petrochemical industry and the fun of running a business.

What professional accomplishments are you most proud of?

I am most proud of the time I have served on high-performing teams that have tackled initiatives of change for the entire Chemical Company. These teams were rewarded for the work that was done to implement the change. Working with all the great people made a difference.

Have there been important turning points in your career?

Yes, after nine years with the company, I was given the opportunity to represent the company and industry with governments and regulatory agencies. It taught me about the great people in my organization I work with and the integrity with which we represent our products.

What have been the biggest changes in your field since starting your career?

Information availability and the digital experience have increased at exponential rates and continue to move quickly. You have to be constantly learning the next technology and be very nimble.

She recently answered the following:

In your current position, what does that mean you do from day to day?

As the Oxo Global marketing manager, I run the business for our higher alcohol and plasticizer products, which represents a key component of our ExxonMobil Chemical Company. These products are intermediate building blocks for hundreds of applications that go into products that affect our everyday life. Our chemistry enables that.



CONGRATULATIONS

CHE GRADUATES



Not Pictured: Samuel Applegate, Brianna Betsch, Joshua Bisges, Christopher Burley, Gregory Burley, Nickolas Mayes, Trevor Miley, Yazmine Patel

M.S. and Ph.D. graduates

Fall 2017

Haider Almkhelfe – Amama (Ph.D.)
Scalable carbon nanotube growth and design of efficient catalysts for Fischer-Tropsch synthesis

Spring 2018

Huan Wang – Amama (Ph.D.)
Rational Design of Graphene-Based Architectures for High-Performance Lithium-Ion Battery Anodes

Mingxia Zhou – Liu (Ph.D.)
First-principles Based Micro-kinetic Modeling for Catalysts Design

Aaron Mcrorie – Edgar (M.S.) - distance
Bold and Small: Using Nanotechnology for Magnetic Filtration of an Inorganic Pigment Liquid Slurry

Summer 2018

Michael Heidlage – Pfromm (Ph.D.)
Sustainable ammonia synthesis via thermochemical reaction cycle

Jared Carson – Rezac (Ph.D.)
Atomic force microscopy study of the metal surface during a palladium-catalyzed hydrogenation membrane reaction

Yixiao Li – Rezac (Ph.D.)
Enabling Membrane Reactor Technology using Polymeric Membranes for Efficient Energy and Chemical Production

Song Liu – Edgar (Ph.D.)
Experimental and Theoretical Studies of Hexagonal Boron Nitride Single Crystal Growth

Chaoran Huang – Anthony (M.S.)
Seed-free short time synthesis of zincosilicate zeolite VPI-8 and its catalysis of methane dehydroaromatization reaction

B.S. graduates

Fall 2017

Diana Abbott – Xenometrics
Montgomery Baker-Fales – CHE Ph.D. candidate, University of Delaware
David Kourchenko – unreported
Sultan Seyedahmed – Saudi Aramco

Spring 2018

Audrey Anderson – Magellan Midstream Partners
Keaton Anderson – unreported
Rachel Anstaett – Grundfos
Samuel Applegate – December 2018 graduate
Mason Armstrong – unreported
Jack Ayres – Special Assistant to the Lieutenant Governor, then KU Medical School
Eric Banning – Caraustar
Brianna Betsch – Koch-Glitsch
Joshua Bisges – Cree
Austin Budke – ExxonMobil
Christopher Burley – Procter and Gamble
Gregory Burley – Pepsico
Jayson Carswell – unreported
David Dougherty – unreported
Bernadette Drouhard – Black & Veatch
Hannah Fain – Newell Brands
Sarah Featherstone – Medical School at KU
Eric Gray – Graduate School at K-State
Eli Janzen – Graduate School at K-State
Marques Jozefowicz – Graduate School at K-State
Kirk Kennedy – unreported
Aishah Khawari – unreported
Megan Kohman – KU School of Medicine
Avery Kostelac – Epic Systems
Karter Krokstrom – Phillips 66

Jacob Larson – unreported
Zachary Lock – Koch Industries
Kayla Maghirang – Graduate School, Pennsylvania State University
Nickolas Mayes – unreported
Jack McCraney – unreported
Logan McGinley – Spirit AeroSystems
Katherine McWilliams – Pfizer
Trevor Miley – unreported
Bryce Misenhelter – Tank Connection
Mary Nelson – Schenck Process
Jess Neufeld – Archer Daniel Midland
Steven Pfeifer – Cargill Corn Milling
Samuel Reesor – Hill's Pet Nutrition
Devon Ronsse – Chevron Phillips Chemical Company
Leah Shenold – unreported
William Smith – Graduate School, Colorado School of Mines
Robert Strine – Keane Group
Benjamin Studer – Archer Daniels Midland
Alina Truong – unreported
Zixian Wang – Graduate School at K-State
Ross Werth – unreported
Angelica White – Pfizer
Regan Wilson – Burns & McDonnell
Logan Zecha – unreported
Martin Ziegler – PepsiCo
Ty Zorn – Ardent Mills, also starting MBA in August



ALUM ESTABLISHES A COMMUNITY OF PROCESS ENGINEERS



"Spend as much time and energy as possible to learn everything you can about the process."

– Scott Love

Although he has held many different jobs in refining, process design, specialty chemicals, corporate engineering, and research in both refining and production, alumnus Scott Love (B.S. 1980) has always considered himself first and foremost a process engineer.

"Once graduates leave academia and go into industrial practice, we all really start out as process engineers," Love said, even when going on to do other things in the course of their careers, this is the formative experience.

"Even during the last 20 years of my career in research," he said, "the contributions I was able to make were really contingent on my experiences as a process engineer. Successful research is all about reduction to practice and being able to implement things on a very practical basis."

Because looking into and understanding the process has always intrigued him, upon retirement Love decided to establish a community of process engineers within

AIChE. While the professional meetings of the organization offer many opportunities for learning about cutting-edge research and the latest advances in chemical engineering, they didn't offer anything to help the day-to-day challenges of process engineers.

As established, it is currently an online community of 100 engineers interested in collaborating and sharing information about process engineering within many different industries.

"Many of the things process engineers do in these different industries are very similar and enabled by a chemical engineering education," Love said. "The goal of this community is to share some of our experiences on heat transfer, reaction engineering and basic process unit operations. This could include how to evaluate the fouling of an existing heat exchanger or when the right time is to clean it.

"This is merely a starting point, though. As more people become engaged, programming will be the natural culmination at AIChE meetings."

Love started with Phillips Petroleum in 1980 as a process engineer at a refinery. Throughout his career, he has been an active member of AIChE, holding positions from director, to committee chairs, to his current seat on the AIChE Foundation Board of Trustees. He is an AIChE fellow.

His advice to new engineers: "Spend as much time and energy as possible to learn everything you can about the process. It can make the difference between success and failure."

For further information about the AIChE Community of Process Engineers, visit: aiche.org/community/process-engineers.

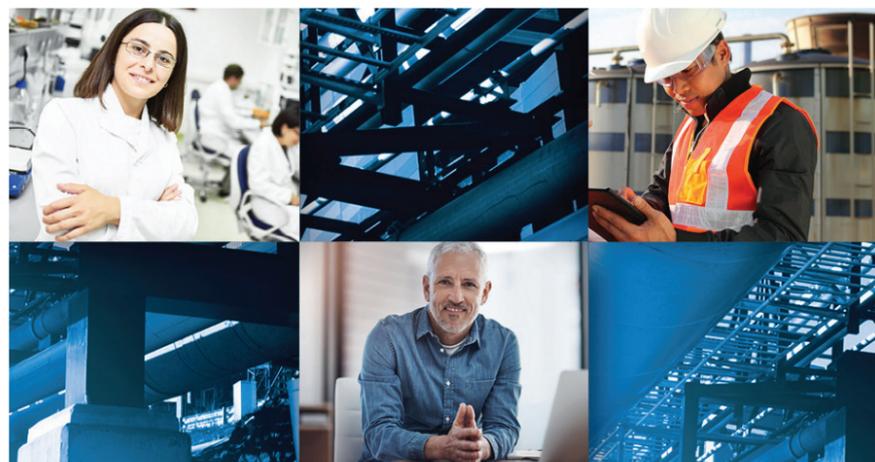


IMAGE COURTESY OF AICHE WEBSITE

STUDENT NEWS BRIEFS

Haider Almkhelfe, CHE doctoral student, was presented with the first-place Carbon Nanomaterials Graduate Student Award at the Nanoscale Science and Engineering Forum last November at the 2017 American Institute of Chemical Engineers annual meeting in Minneapolis, Minnesota. The award honors graduate students whose research achievements, in the broad area of carbon nanomaterials, demonstrate a high level of excellence. Finalists are selected from abstract submissions and the presentation of their work in the award session of the forum. Placidus Amama, assistant professor and Tim Taylor chair in chemical engineering, is Almkhelfe's major professor.

Jack Ayres was one of 12 students recognized as an Outstanding Graduating Senior by the Dean of Student Life. Ayres served as the 2017-18 student body president of Kansas State University.

Sarah Featherstone was inducted into Phi Kappa Phi, the oldest and most prestigious all-discipline honor society, which recognizes and promotes academic excellence in all fields of higher education, and engages the community of scholars in service to others. New senior initiates must be in the top 10 percent of their class. Featherstone graduated Summa cum laude in May 2018, and will be attending medical school at the University of Kansas in the fall.

Graduating senior **Eli Janzen** received a summer undergraduate research fellowship to work at the National Institute of Standards and Technology in Gaithersburg, Maryland, during the summer of 2018. He will help to develop a thermodynamic model for the cobalt-rhenium phase diagram. Janzen will begin work toward his Ph.D. in chemical engineering at K-State in the fall.

Max Meyer was selected as a new member for the Mortar Board Senior Honor Society for the 2018-19 academic year. Mortar Board is dedicated to promoting scholarship, leadership and service to the community.

Olivia Peiffer, class of 2020, was selected for the 2018-19 Raj and Diana Nathan Undergraduate Research Experience Award from the College of Engineering. She will be developing techniques for measuring low concentrations of boron in biological samples to facilitate further studies in boron-neutron-capture therapy for use in treating certain cancers. Her research will be directed by John Schlup, CHE professor.

KANSAS STATE UNIVERSITY CHEMICAL ENGINEERING EXCELLENCE FUND

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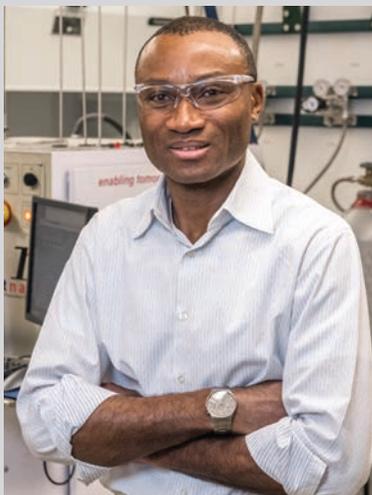
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Kansas State University prohibits discrimination on the basis of race, color, ethnicity, national origin, sex (including sexual harassment and sexual violence), sexual orientation, gender identity, religion, age, ancestry, disability, genetic information, military status, or veteran status, in the university's programs and activities as required by applicable laws and regulations. The person designated with responsibility for coordination of compliance efforts and receipt of inquiries concerning the nondiscrimination policy is the university's Title IX Coordinator: the Director of the Office of Institutional Equity, equity@k-state.edu, 103 Edwards Hall, 1810 Kerr Drive, Kansas State University, Manhattan, Kansas 66506-4801. Telephone: 785-532-6220 | TTY or TRS: 711. The campus ADA Coordinator is the Director of Employee Relations and Engagement, who may be reached at charlott@k-state.edu or 103 Edwards Hall, 1810 Kerr Drive, Kansas State University, Manhattan, Kansas 66506-4801, 785-532-6277 and TTY or TRS 711. Revised Aug. 29, 2017.

DEPARTMENT NEWS



Placidus Amama was promoted to associate professor beginning in fall of 2018. Amama has been with the department since fall 2013.



Ninety-six students attended the 2018 department of chemical engineering awards banquet celebrating student and faculty accomplishments.



Assistant Professor Urara Hasegawa received a grant from the Center for Molecular Analysis of Disease Pathways, a National Institutes of Health Center for Biomedical Research Excellence, for her research project entitled "Nanoparticle Platform for

Site-Specific Delivery of the Gasotransmitter Hydrogen Sulfide." The goal is to develop a method of delivering hydrogen sulfide to specific body sites to treat cancer, and cardiovascular and neurodegenerative diseases.