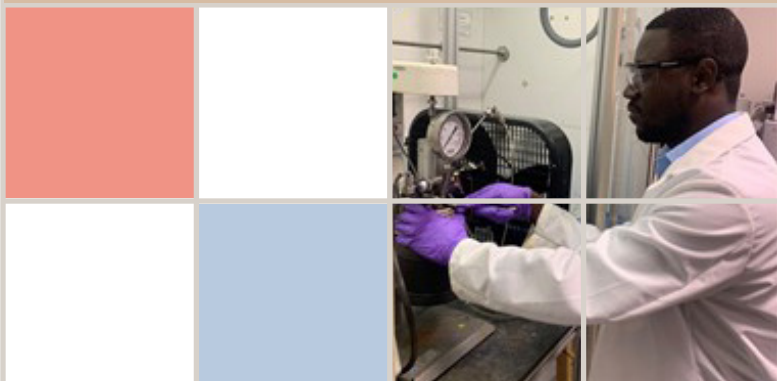
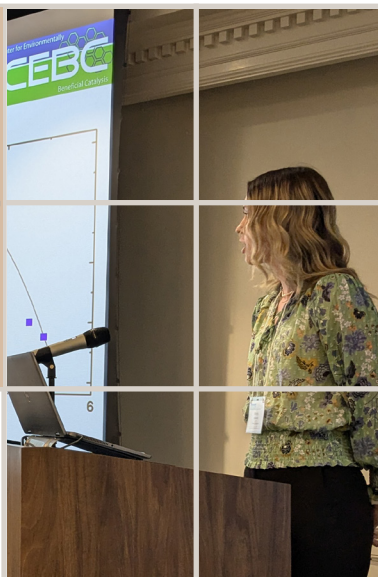




CENTER FOR ENVIRONMENTALLY BENEFICIAL CATALYSIS

The University of Kansas



Center for Environmentally

CEBC

Beneficial Catalysis

Rising to Challenges of the Chemical Industry

2025
Annual Report

Patents & Publications

Continued on back page



Inventions & Patents 2004-2025

86 invention disclosures
26 patents issued

Patents issued in 2025

- "Bimetal-Incorporated Mesoporous Silicates for Alcohol Dehydration and related Methods," B. Subramaniam, A. Ramanathan and H. Zhu. U.S. Patent 12,194,451, Issued Jan. 14, 2025
- "Methods for forming Lignin Pre-polymers and Lignin Resins," B. Subramaniam, J. R. Silverman, A. M. Danby, T. P. Binder and S. Green. U.S. Patent 12,234,329, Issued Feb. 25, 2025

Selected 2025 Publications

See complete list at www.cebc.ku.edu/publications

Aghaei, Z.; Opalade, A. A.; Day, V. W.; Jackson, T. A., Oxygen Reduction by Amide-Ligated Cobalt Complexes: Effect of Hydrogen Bond Acceptor. *Molecules* **2025**, 30 (15), 3274. doi:10.3390/molecules30153274

Al-Barghouti, K. S.; Kore, R.; Agbodekhe, B.; Trevisan Melfi, D.; Marin-Rimoldi, E.; Shiflett, M. B.; Maginn, E. J.; Scurto, A. M., Experimental Measurements and Molecular Dynamics Simulations of Self-Diffusivity in Mixtures of [C2C1im][Tf2N] with Difluoromethane and Pentafluoroethane. *J. Phys. Chem. B* **2025**, 129 (28), 7311-7326. doi:10.1021/acs.jpcc.5c02880

Alzahrani, H. A.; Zhu, H.; Bravo-Suárez, J. J., Catalytic and modulation excitation visible-NIR spectroscopic insights into the consequences of K promotion and pretreatment on Cu/SiO2 for direct propylene epoxidation. *Journal of Catalysis* **2025**, 116242. doi:https://doi.org/10.1016/j.jcat.2025.116242

Featured on I&EC Research cover April 30, 2025

Mark, N. P.; Singh, S. K.; Uchagawkar, A.; Hagberg, E.; Binder, T.; Subramaniam, B., Impacts of Sulfur Impurity and Acid Pretreatment on Catalytic Depolymerization of Corn Cob Lignin. *Industrial & Engineering Chemistry Research* **2025**, 64 (17), 8630-8641. doi:10.1021/acs.iecr.4c04479

Castilla-Acevedo, S. F.; Pallais-Leclair, A.; Melfi, D. T.; Bhalode, P.; Mellein, B.; Scurto, A. M.; Vlachos, D. G.; Allgeier, A. M., Understanding the solubility behavior of 2,2&-bifuran-5,5&-dicarboxylic acid in different pure solvents. *Fluid Phase Equilib.* **2025**, 594, 114355. doi:10.1016/j.fluid.2025.114355

Curry, T. D.; Cooper, F. L.; Lind, N. M.; Thach, C. L.; Khalife, C.; Blakemore, J. D., Quantifying the Lewis Acidity of Mono-, Di-, and Trivalent Cations in Anhydrous Bis(trifluoromethylsulfonyl)imide Salts. *Inorg. Chem.* **2025**, 64 (49), 23920-23938. doi:10.1021/acs.inorgchem.5c03576

Ervin, A. C.; Blakemore, J. D., Hydrodynamic characterization of the redox chemistry of crown-encapsulated uranyl complexes. *Frontiers in Nuclear Engineering* **2025**, Volume 4 - 2025.

Farris, B. R.; Leonard, K. C., Accelerating Catalysis Understanding via Large Language Model Data Extraction and Shallow Machine Learning Techniques. *JACS Au* **2025**, 5 (11), 5578-5589. doi:10.1021/jacsau.5c01087

Fields, C. C. I. V.; Jain, P.; Subramaniam, B.; Allgeier, A. M.; Vlachos, D. G.; Lobo, R. F., Intensification of Renewable 4,4'-Dimethylbiphenyl Synthesis for Recyclable Diesters. *ACS Sustainable Chem. Eng.* **2025**, 13 (4), 1754-1761. doi:10.1021/acssuschemeng.4c09233

Gipper, J. R.; Gonzalez-Eymard, S.; Abdoullaeva, J.; Caricato, M.; Shoshani, M. M., A Ni-Al Hydride Cluster Bearing Site-Differentiated Al Centers: Demonstration of Olefin Insertion and Alkyl Transfer. *Inorg. Chem.* **2025**, 64 (43), 21317-21322. doi:10.1021/acs.inorgchem.5c02694

Gumaste, T.; Cooper, F. L.; Blakemore, J. D., Analysis of Bis(trifluoromethylsulfonyl)imide Interactions with Metal Cations Through a Chemical Informatics Approach. *Molecules* **2025**, 31 (1). doi:10.3390/molecules31010018

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From the Director

I am pleased to present this 2026 Annual Report of the Center for Environmentally Beneficial Catalysis (CEBC) as one of my first duties as the new Director of CEBC. I assumed this post in January of 2026, inspired by the potential of our Center to pursue our mission “to invent cleaner, safer, energy efficient technologies that protect the planet and human health.” In doing so we embrace our role as educators of a new generation of research talent and seek to build a culture where every trainee thrives and feels valued.

I am also grateful for the leadership of Dr. Bala Subramaniam, our founding director, and the Dan Servey Distinguished Professor of Chemical and Petroleum Engineering, and his decades of excellence in research leadership. He crafted a vision and nurtured relationships that supported the success of CEBC. I appreciate that, while he is primarily focusing on research activities in his group, he is still energetically supportive of CEBC through mentorship, advice and program leadership.

Organizations evolve and we see 2026 as a year of adaptation. Shifts in federal funding of academic research and broad challenges in the economy present opportunities for creative thinking. Moving forward, I have asked our principal investigators and researchers to promote CEBC core strengths in reaction engineering, data science, and, of course, the multiple modalities of catalytic phenomena. Skills in reaction engineering are valuable to industry, and we seek to be a leader in such training.

Further, we have identified a growing collection of federal opportunities focused on artificial intelligence and data science, for which we are well-suited to compete. The former NSF National Research Traineeship (NRT) program at CEBC — labeled The Internet of Catalysis — positioned CEBC as an early leader in data science for catalysis and led to the formation of a certificate program at KU. We are grateful for Kevin Leonard’s leadership in this space and look forward to even more collaborative projects across CEBC.

Since 2021, seven assistant professors in chemistry and engineering have partnered on collaborations within CEBC. A new generation brings new ideas, which we are happy to feature in the coming pages. The group of Aaron Teator in Chemistry pursue post-polymerization modification to impart new properties to materials, and the group of Manar Shoshani in Chemistry are interrogating mechanistic aspects of carbon dioxide conversions with homogeneous catalysts. Each of these colleagues recently garnered an NSF CAREER award to support their growing research efforts, and theirs join other notable grants funded in 2025 by our junior colleagues, exploring electrocatalysis, water-treatment, enzyme engineering, plastics upcycling and more.

CEBC has consistently worked with industry to define new use-inspired research themes. In 2025 we hosted two industry workshop events to further that aim. As you can read on page 9, one focused on industrial chemicals and biorenewables and one was specific to the pharma industry. We are grateful to participants for sharing their perspectives on workforce development, potential innovations in the model for graduate education in the USA, and specific research themes that support industrial competitiveness. Our students and all trainees benefit from our membership / advisory board relationships, and we encourage even more companies to partner with us as we advance our mission.

Sincerely,



Dr. Alan Allgeier
CEBC Director



Rising to Challenges of the Chemical Industry

As the chemical industry's global output continues to expand, the Center's mission is more relevant than ever.



Subramaniam transition

CEBC founder steps back from directorship



Dr. Bala Subramaniam, Dan F. Servey Distinguished Professor of Chemical Engineering, stepped down from leading the Center for Environmentally Beneficial Catalysis as director on December 31, 2025. He continues as a Distinguished Professor in the KU Chemical & Petroleum Engineering Department and a primary investigator for several of CEBC's funded research projects.

Bala's 22 years of visionary leadership have guided the CEBC's continuous growth with strategically selected core projects and synergistic research teams. During Bala's tenure as director the center attracted \$47 million in federal funds and \$17 million in industry and private funding. Through these funded projects, the CEBC has given the chemical industry and the world many significant breakthroughs in green and sustainable chemistry.

Major federal grants during Bala's years as CEBC director include \$5.6 million from the United States Department of Agriculture (USDA) to advance clean technologies, a \$4.4 million National Science Foundation (NSF) & Environmental Protection Agency (EPA) Networks for Sustainable Molecular Design & Synthesis grant, a \$4 million NSF early career research grant with the University of South Carolina focused on catalysis for renewables, and a \$4 million NSF grant with University of Delaware and Pittsburg (KS) State University to advance manufacturing of renewable and recyclable polymers.

The CEBC's roots were established during early collaborations between Bala and Dr. Darlye Busch, deceased 2021, Distinguished Professor of Chemistry. While pioneering CO₂-expanded liquids, or CXLs, as pressure-tunable reaction media for partial oxidations, the two KU professors envisioned an Engineering Research Center (ERC) to "systematically address urgent technological needs through the development of environmentally friendlier and inherently safe catalytic processes with economic viability."

That combination of engineering and chemistry would become the foundation of CEBC. For the National Science Foundation ERC proposal, Bala and Daryle sought partnership with the University of Iowa, University of Washington in St. Louis, and Prairie View A&M University in Texas. Through the years, a total of 28 chemical companies have been CEBC Industry Advisory Board members, a nod to Bala's ability to facilitate partnerships between academia and industry.

Under Bala's leadership, the ERC research was organized into "thrust groups," exemplar systems designed to address grand challenges facing the chemical industry. Working under the broad thrust categories of Active Site Design & Synthesis, Media & Catalyst Support Forms, Experimental Design & Advanced Measurements, and Structural, Mechanistic & Process Modeling, the CEBC nurtured cross-disciplinary projects involving P.I.s from Chemistry, Chemical Engineering, Civil/Environmental Engineering and Mechanical Engineering at KU and the partner universities.

Leading the Media & Catalyst Support Forms group, Bala helped the CEBC garner success in 2006 with tunable CO₂-expanded liquids (CXLs), leading to an issued patent in 2014. In 2007, his research group showed liquid CO₂ to be a safe and inert solvent for ozonolysis chemistry. Through the years, Bala's notable advances in catalysis have included the development of polymer-bound precious metal catalysts, a radically greener ethylene oxide process lauded by the American Chemical Society, and a revolutionary spray oxidation technique curbing CO₂ emissions. Patented in 2016, Bala's spray oxidation technique has since been adapted to multiple applications. Under Bala's leadership, the CEBC has had 26 patents issued to date.

Bala continues to conduct CEBC core research. He is currently primary or co-investigator on major projects. His sponsored research supports two graduate students, two postdoctoral researchers and two associate researchers. He looks forward to continuing to collaborate with CEBC faculty and industry partners.

CEBC Deputy Director Alan Allgeier is the Center's new director, effective January 2026. Alan succeeds Dr. Bala Subramaniam, CEBC co-founder and longtime director. Alan has served as CEBC Deputy Director since 2020, following the retirement of former deputy director Dr. R.V. Chaudhari.

As director, Alan looks forward to building on the excellence in research and workforce development that has been CEBC's hallmark since its 2003 founding. "Continuing to expand collaborations with industry partners across the chemical, biorenewable, polymer and pharmaceutical sectors will be a critical strategy," he said, "to help connect KU's fundamental research to regional and national needs – supporting economic growth and quality of life."

Alan's interest in the CEBC began with his 2017 hiring as an associate professor for the University of Kansas Chemical and Petroleum Engineering Department. With a strong background in catalysis, he has brought exciting new research to KU and CEBC. His KU lab group conducts research in heterogeneous catalysis, enzyme catalysis, natural polymers, characterization science, and pharmaceutical manufacturing.

The Allgeier lab's first collaborative project was based on a 2020-2023 grant from the Kansas Corn Commission (KCC) to explore biocatalytic ethanol oxidation as a platform technology. In 2021, on the heels of the KCC grant, Alan co-led a multi-university team on a \$4 million, five-year NSF grant to advance manufacturing of renewable and recyclable polymers (called R2P).



Dr. Alan Allgeier
CEBC Director

Dr. Alan Allgeier takes reins as CEBC Director

Allgeier Group's Work Is "Rock Chalk Ready"

KU's Center for Technology Commercialization (KUCTC) selected a project of Alan Allgeier's research group for the inaugural Rock Chalk Ready program to mature early-stage innovations and position them for commercialization success. Allgeier's "Technologies to Enhance Corn Oil Extraction During Ethanol Production" is one of six promising KU innovations selected.

Supported by a FORGE grant from the Kansas Department of Commerce, Rock Chalk Ready reflects a collaborative One KU approach, inviting participation from innovators on KU's Lawrence and Medical Center campuses. The program aims to de-risk technologies and business concepts by providing funding, guidance and connections to resources across KU's innovation ecosystem.

The project has advanced to the NSF Regional iCorps program to support translation of academic science to commercial reality.

While accelerating his research accomplishments, Alan also increased his focus on promoting regional collaborations in catalysis among midwestern universities and chemical companies. A founding member in 2018 of the Great Plains Catalysis Society (GPCS) chapter of the North American Catalysis Society, Alan served on the GPCS executive committee from 2018 to 2024. As chair in 2022-2023 he presided over the GPCS 2023 Annual Meeting held at KU in conjunction with CEBC's 20th anniversary.

Alan utilizes experience from his twenty-year career in the chemical and pharmaceutical industries to envision and realize revolutionary technologies for the sustainable manufacture of chemicals and materials. His expertise in heterogeneous and homogeneous catalysis and reactor design have been instrumental in producing large-scale monomers for nylon and polyesters, and small-scale pharmaceuticals and specialty chemical products.

Hired as a postdoctoral researcher by DuPont in 1997, Alan's professional career progressed as he became a Senior Research Chemist focusing on heterogeneous catalysis and three-phase reactions for production of nylon monomers and specialty chemicals. Following DuPont's divestiture of nylon in 2004, he joined Amgen, Inc. to help establish the Amgen Catalysis and Hydrogenation Group, and to conduct process development and clinical manufacturing. In 2011, Alan joined DuPont Central Research, reaching the level of Senior Principal Scientist, and was a technology leader for surface and particle science in the Corporate Center for Analytical Sciences.

Alan received his B.S. Chemistry from Case Western Reserve University (Cleveland, Ohio) and subsequently obtained his M.S. and Ph.D. degrees in Inorganic Chemistry from Northwestern University (Evanston, Illinois). He has garnered recognitions during his career, including the 1994 Sigma Xi Award at Northwestern University for excellence in graduate research, being elected to Chair the Organic Reactions Catalysis Society from 2008-2010, the 2011 Amgen (internal) Green Chemistry Award, the 2014 Russell Malz Awardee for Service to Catalysis from the Organic Reactions Catalysis Society and the 2021 Catalysis Club of Philadelphia Award.

Accelerating Discovery

Despite 2025 federal headwinds, KU and CEBC gain ground in research funding

The year 2025 saw unprecedented levels of funding cuts in nearly every federal agency. Budget cuts to the National Science Foundation and the Department of Energy had significant impact on in-place CEBC research projects during the year. Remarkably, with assistance from less traditional funding sources and innovations by the KU Office of Research, CEBC investigators have been able to continue core projects and start new ones.

New federal funding. Six CEBC faculty members secured individual research funding from DOE (James Blakemore), ACS (Juan Bravo-Suárez), NIH (Kendrick Smith), and NSF (Rachael Farber, Manar Shoshani and Aaron Teator), representing more than \$5 million promoting their sponsored research initiatives.

New industry funding. Four different companies sought out CEBC faculty members for targeted research projects. Chemistry Professor James Blakemore, Chemical Engineering Professor Aaron Scurto, and Distinguished Professor of Chemical Engineering Bala Subramaniam garnered a total of \$321,374 in new industry-sponsored projects.

State of Kansas, KU, and collaborative funding.

- Chemistry Professor and department chair Tim Jackson received \$1 million through the National Strategic Research Institute at the University of Nebraska to support a multidisciplinary KU research team spanning the Departments of Chemistry, Ecology and Evolutionary Biology, and Mechanical Engineering.
- Chemical Engineering Assistant Professor Elizabeth Corson partnered with Wichita State University on a carbon valorization project worth just under \$200,000. She also earned one of KU's new initiative awards, a KU New Faculty Research Development Award of \$10,000.
- Environmental Engineering Associate Professor Justin Hutchison won a \$620,000 grant from the Kansas Water Resources Institute.

Electravera Start-Up one of 16 selected for new ACCEL-KS funding

Electravera, the brainchild of KU Chemical Engineering Professor Kevin Leonard, graduate student Shelby Atherton and recent graduate Dr. Brianna Farris, is among 16 start-up companies awarded funding from the new Kansas Department of Commerce ACCEL-KS program. Administered by KU Innovation Park and Wichita-based Groover Labs, the statewide initiative seeks to fast-track high-potential projects toward commercial success. More than 65 entrepreneurs applied in the first year of funding.

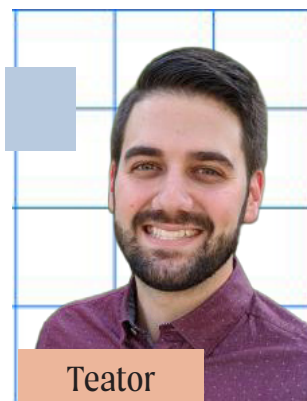
The two chemical engineers are researchers in Dr. Kevin Leonard's laboratory group. Partnering during their participation in the highly successful CEBC NSF Research Traineeship (NRT) program, Bri and Shelby began to seek a low cost, low energy solution to critical mineral recovery from end-of-life batteries. Their novel electrochemical process is designed to selectively recover critical minerals from diverse lithium-ion battery waste streams and convert them into high-purity feedstocks for electronic device manufacturing.

With ACCEL-KS support, their goal is to enable a circular economy for critical materials, reducing waste and strengthening U.S. technological resilience.

Two CEBC assistant professors in Chemistry earn National Science Foundation's prestigious award for early-career faculty

Dr. Aaron Teator's research group is developing new materials that have broad potential uses, including more robust, decomposable, and recyclable plastics and rubbers. Over the past five years, Teator and his research group have been part of a multi-institution NSF RII Track-2 FEC grant, "Advanced Manufacturing Renewable and Recyclable Polymers" with six other CEBC/KU research groups. The CAREER award garners the Teator group \$687,000 over the next five years.

Dr. Manar Shoshani received a five-year CAREER award totaling more than \$769,000 to further his research on converting carbon dioxide so it can be used to develop valuable products for energy, agriculture and pharmaceuticals. Those products would be useful as common commodity chemicals and have high value in the energy sector and agricultural and pharmaceutical industries, among other areas.



Teator

CAREER Awards



Shoshani

Dr. Kevin Leonard named KU School of Engineering Associate Dean

Professor of Chemical & Petroleum Engineering Kevin Leonard will serve as associate dean for research. Kevin joined KU/CEBC in 2013. He has a successful and diversified research record, serving as PI on projects valued at more than \$6 million, combined CEBC and School of Engineering projects, and founding three spin-off companies, including Avium, LLC, which operates in Lawrence, KS. Most recently through CEBC, Kevin led an NSF NRT project on the incorporation of AI training in engineering education. Kevin looks forward to supporting the development of research teams with members both inside and outside the School of Engineering.



Leonard



Blakemore

Bravo-Suárez

Caricato

Corson

Jackson

Subramaniam

Faculty Recognition

Dr. James Blakemore is the 2025-2028 Keith D. Wilner Chair in Chemistry, receiving financial support for research from the fund. James is the second to receive this rotating Chair, made possible by the generous support of KU Chemistry alumnus Dr. Keith Wilner.

Dr. Juan Bravo-Suárez has been elected as Great Plains Catalysis Society Chair 2026. Dr. Bravo Suárez has served as secretary for GPCS and has been active in managing the group's webinar series. He has also helped with the annual GPCS Symposium each fall.

Dr. Marco Caricato received the Robert and Eugenia Terss Research Award from the KU Department of Chemistry in May, given for overall excellence in publications.

Dr. Elizabeth Corson has been elected to serve as American Institute of Chemical Engineers Awards Chair for Area 1E, Electrochemical Fundamentals. The committee's primary role is to select each year's recipients for AIChE's Institute Awards.

Dr. Nakisha Mark Makes her mark on CEBC Education & Outreach

While maintaining an active research portfolio in the laboratory, Nakisha now guides CEBC's Education and Outreach programs. Her diverse experiences in academia, agriculture and health bring seamless continuity to the long-established education and outreach portfolio at CEBC. Nakisha's efforts are supported by the KU Office of Research's newly appointed Director of Researcher and Trainee Development, Dr. Ana Chicas-Mosier, formerly of CEBC. Dr. Mark is excited to bring her creative and innovative mindset from the laboratory, adding new ideas to capture the enthusiasm of CEBC and the wider KU community.

Dr. Timothy Jackson received one of five William T. Kemper Fellowships for Teaching Excellence. Each year, the \$7,500 fellowships are awarded to outstanding KU faculty whose innovative approaches to teaching help students gain crucial skills, embrace academic and professional challenges, develop learning strategies, and improve long-term student success.

Dr. Bala Subramaniam was appointed as Editor-in-Chief of the 10th Edition Perry's Chemical Engineers' Handbook. Known as "The Chemical Engineer's Bible," the reference book has been a source of chemical engineering knowledge for a wide variety of engineers and scientists for more than 80 years.

Welcome! Dr. Kendrick Smith Assistant Professor of Chemistry

Research Interests:

Research in the Smith lab investigates the synthetic potential of enzymes as catalysts to accomplish challenging chemical transformations. The group leverages natural biosynthetic enzymes and artificial, designer enzymes to streamline syntheses of complex natural products and biologically active small molecules, and to provide sustainable alternatives to venerable reactions in molecular synthesis. These goals are tackled by linking expertise in organic synthesis and catalysis, enzymology, high-throughput experimentation and bioinformatics.

Notable:

2024 Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) K99/R00 Fellow, an American Society for Biochemistry and Molecular Biology (ASBMB) program funded by the National Institutes of Health

Education:

- Postdoctoral Fellowship, 2020-2025, University of Michigan, Ann Arbor
- PhD Chemistry, 2020, University of North Carolina, Chapel Hill
- BS Chemistry, 2013, University of Virginia



Smith

Increasing
Expertise
& Expanding
Outreach



Mark

Catalyzing Discovery

Ramping up solar panels recycling DOE \$1,300,000 2023-2027

Solar power is cost-competitive and avoids carbon emissions associated with conventional energy sources. By 2050, the demand for solar power is estimated to be as much as 100 Terawatts. Recently, however, solar panels have come under significant criticism because over 80% of old panels are currently sent to landfills. The cost of recycling the panels is now about \$20 to \$30 each, while the cost for disposal is about \$1 to \$2. At the same time, valuable materials including silver, silicon and glass that could be recovered from recycled panels are wasted in landfills.

Critics argue that this massive waste creates environmental risks, as panels can contain toxins like lead and cadmium. Cadmium (Cd) and tellurium (Te) are critical materials to produce high efficiency CdTe photovoltaic (PV) panels. To ensure supply chain safety and economic production, cost effective and environmentally benign technologies to recover and recycle critical minerals are needed.

In conventional technologies, the solar panels are crushed and concentrated acid/oxidant mixture is used to recover the Cd and Te present in dilute concentrations (0.2 wt.% of total panel mass). Collaborating with the Idaho National Laboratory and First Solar Inc., P.I. Dr. Bala Subramaniam and Associate Researcher Dr. Hongda Zhu have developed a technology that uses benign solvents and acoustic vibrations to swell polymeric resins and rapidly delaminate solar panels to selectively recover the exposed PV semiconductors as a suspension in water (>99 wt.% recovery of Cd and Te).

By concentrating the Cd and Te in much smaller volumes of water, the CEBC process avoids the use of large volumes of mineral acids and oxidants, promoting the sustainable recycling of solar panel components. Insights into polymer resin/solvent compatibility and the delamination mechanism are guiding optimal process development and scale-up.

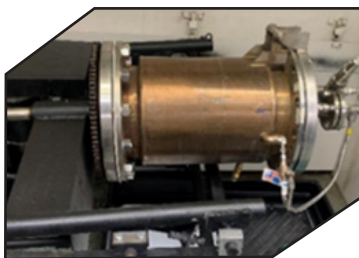
Researchers at KU's CEBC are working with academic, industry and national lab partners to develop processes to sort municipal waste, isolate usable plant-based materials, and design storable and transportable feedstocks for manufacturing products. The Center for Mineral and Metal Oxide Removal from Biomass (CMORE), headquartered at the University of Wisconsin, is one of five projects funded by a partnership of Schmidt Sciences and the Foundation for Food & Agricultural Research. The two organizations have established the Virtual Institute on Feedstocks of the Future (VIFF) to enhance scientific collaboration in transforming biomass into key products in a more sustainable, circular bio-economy.

Working with collaborators, the VIFF research team at CEBC — Bala Subramaniam, Thomas Binder, Sandip Singh, Nakisha Mark and Paul Nyankey — is developing technologies to

transform agricultural/forestry residues and municipal solid waste into sustainable materials and products. An important aspect that has received scant attention is the effect of mineral content in biomass on organosolv/acetosolv fractionation—a process to deconstruct plant materials into their cellulose, hemicellulose and lignin components. Biomass feedstocks contain significant amounts of inorganic minerals, such as potassium, calcium, and silica, which manifest as ash and adversely affect their downstream conversion via processes such as grinding, pyrolysis and gasification. Biomass demineralization has the potential to not only enhance downstream thermal and catalytic processes but also promote sustainable agriculture by returning the removed mineral nutrients to the soil.

Using beetle-killed pine wood (BKP) as feedstock, CEBC researchers have shown chemical demineralization of the BKP feedstock largely preserves the composition and yields of the acetosolv fractions while significantly improving bio-oil yields during reductive catalytic fractionation. The VIFF team is systematically investigating how BKP demineralization, characterized by different ash contents and elements, affect the yields, structure and composition of the cellulose and lignin fractions during acetosolv and reductive catalytic fractionations. Insights from such studies are of fundamental and practical significance.

To make larger quantities of the various fractions for product testing purposes, a 20-L pilot-scale biomass fractionation reactor (shown in photo), donated by ADM, has been successfully commissioned at the CEBC. The new reactor can process 2–3 kg biomass per batch and is equipped with a 50 L rotary evaporator for solvent recovery



and recycling. The team expects that the availability of this larger scale unit will spur further collaborations aimed at process and product development, thereby expediting the commercialization of biorefineries based on agricultural and forestry residues.

Acetosolv scale-up modeling supports researchers' experiments

While researchers conduct experiments at the laboratory scale, they also carry out software simulations of manufacturing plants to estimate costs and environmental impacts of a commercial-scale process.

In one example based on laboratory data from the Acetosolv project, graduate student Fernando Zea of Chemical Engineering Associate Professor Kyle Camarda's research group modeled a manufacturing plant and completed an economic projection. The estimated annual revenue of an Acetosolv plant processing 150,000 tons per year would be \$129 million per year, against a total annualized cost of \$42 million per year, showing a significant profit potential.

Using a Life Cycle Assessment model to estimate environmental performance, the Acetosolv process shows 46% lower greenhouse gas emissions compared to a standard Kraft process used in the pulp and paper industry. As additional data become available, further refinements to the models can guide scale-up towards commercialization by clarifying assumptions and reducing uncertainty.

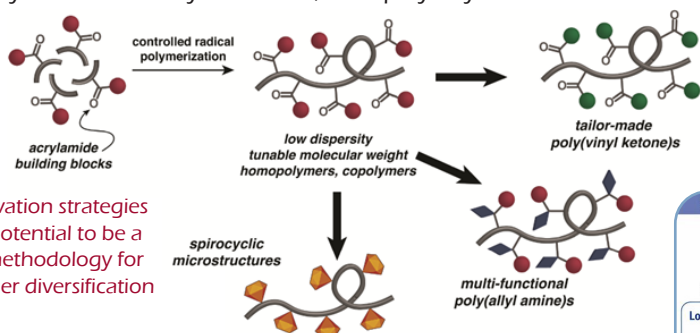
From waste to sustainable agriculture VIFF \$10,000,000 2024-2029

Exploring a new path toward designing degradable synthetic polymers

In the search for better-performing materials, chemists must tweak the properties of the polymers they make. Traditional approaches involve changing the building block chemicals and using additives during the material synthesis that, for example, may make a film more durable in harsh conditions or perhaps more easily degradable in the environment. This approach, known as controlled radical polymerization (CRP), has resulted in a wide range of commercial materials. But not all chemical functionalities are easily accessible using this method.

Kasun Wekasinghe and his coworkers in Aaron Teator's lab group have been exploring a complementary strategy known as postpolymerization modification (PPM), which involves reactively altering the properties of the polymer after it's been synthesized through targeted reactions. Specifically, they treated unactivated poly(dialkylacrylamide)s with trifluoromethanesulfonic anhydride (Tf₂O). This resulted in the generation of keteniminium ions that, with another step called nucleophilic quenching, enabled selective conversion of pendant amide groups on the original polymer to aryl ketones. As reported by the researchers (*J. Am. Chem. Soc.* **2025**, 147 (25), 21302-21307), their resulting material can be broken down by UV light, whereas the original polymer is non-degradable at similar conditions.

This new approach avoids the need for designer monomers or activated polymer precursors, allowing the team to prepare a series of previously unattainable functional copolymers from easily accessible, inert polyacrylamides.



Amide activation strategies have the potential to be a platform methodology for rapid polymer diversification

Reflecting on the impact of a major grant

NRT \$3,000,000 2019-2025

Though the National Science Foundation Research Traineeship (NRT) has concluded, its legacy of interdisciplinary leadership and professional growth continues. The grant cultivated a cross-disciplinary environment where engineers, chemists, and computer scientists developed fluency in each other's fields.

Beyond the classroom, trainees engaged in international collaborations, built skills aligned with emerging industry needs, and contributed insights to both governmental agencies and private stakeholders. The program also strengthened the university's mentorship culture, with faculty and staff applying lessons learned at both institutional and multi-institutional levels.

The NRT's influence extends well beyond its six-year funding period. An elective course in machine learning for scientists and engineers — critical for preparing graduates for today's cross-functional chemical industry — continues to be offered, alongside a new graduate certificate that formally recognizes student achievement in the field. Analytical tools developed through the program remain active in university laboratories, enhancing research capabilities on campus.

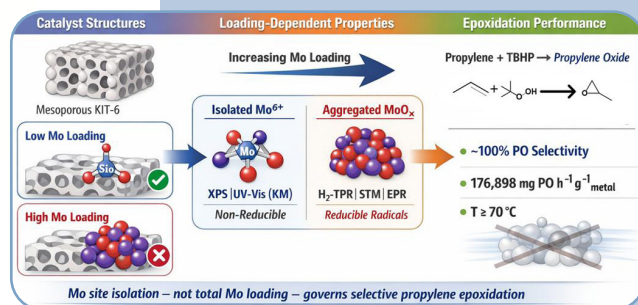
NRT alumni have taken their cross-disciplinary expertise into the private sector, with ventures such as Electravera and Avium Energy applying machine learning skills to deliver meaningful business impact.

Catalyzing Discovery

Getting "Mo" from selective oxidation

Selective oxidation of small organic molecules is a key process in industrial catalysis with significant economic and environmental benefits. One important application is converting propylene to propylene oxide (PO), a major manufacturing process used to produce glycols and other wide ranging specialty chemicals. The main challenge is achieving high product selectivity to avoid undesired products such as CO and CO₂. Therefore, rational design of catalytic active sites based on a fundamental understanding is essential.

CEBC researchers Drs. Bala Subramaniam and Sahil Kumar have demonstrated that silica-supported molybdenum (Mo) catalysts show remarkable performance for this reaction at mild reaction conditions. These insights provide a scalable design principle for next-generation oxidation catalysts for sustainable chemical manufacturing.



Systematically controlling Mo loading on ordered mesoporous KIT-6 silica, they hypothesized that isolated tetrahedrally-coordinated molybdenum sites deliver complete PO selectivity toward propylene oxide at a 137-times higher rate compared to other reported Mo-based catalysts.

Graduate student Lindsey Penland of Dr. Rachael Farber's research group used scanning tunneling microscopy (STM) to reveal the structure of the Mo catalyst surface with atomic-scale resolution, highlighting the difference in Mo adsorption between low- and high-loading Mo catalysts. Scanning tunneling spectroscopy (STS) data highlights the subtle variations in Mo states on catalysts of different loading, emphasizing that Mo site isolation, not the total Mo quantity, helps drive PO formation.

Industry & Science Advisory Boards

Industry Advisory Board (IAB)

ACS Green Chemistry Institute

Dr. Edmond Lam, Assistant Director

Archer Daniels Midland

Dr. Derek Butler, Senior Scientist/Lab Manager

Chevron Phillips Chemical Co.

Dr. Pasquale Iacono, Research & Process Chemist

Gevo, Inc.

Dr. Andrew Ingram, Director of Process Chemistry & Catalysis

Johnson Matthey

Dr. Jerry Springs, R&D Director

W.R. Grace

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Science Advisory Board (SAB)

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National Laboratory of the Rockies
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Dr. Elizabeth Biddinger

The City College of New York
Associate Professor, Chemical Engineering

Dr. Hai-Ying Chen

Oak Ridge National Laboratory
Distinguished R&D Scientist

Dr. Rachel Getman

The Ohio State University
Professor & Chair, Chemical & Biomolecular Engineering

Dr. Friederike Jentoft

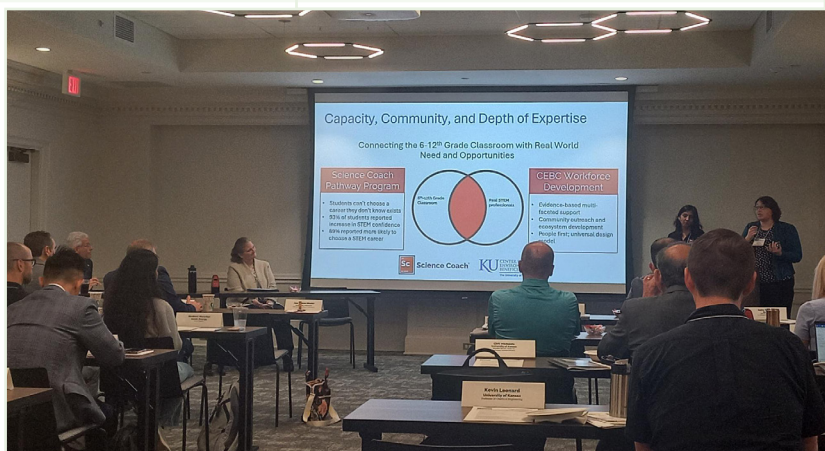
University of Massachusetts, Amherst
Professor of Chemical Engineering

Dr. Justin Notestein

Northwestern University
Professor & Chair, Chemical & Biological Engineering

The CEBC organized workshops for the chemical and pharmaceutical industries, exploring workforce development and industry/academe collaboration. Student training in AI/data science, process safety management, and integration of chemistry and process engineering knowledge were emphasized as important to industry in assessing candidates for employment.

Workshops engage industry and academia



CEBC faculty presented their research areas of expertise to attendees from the chemical industry during the Fall Industry Advisory Board Meeting. In November, a virtual workshop covering these topics was convened with representatives of seven pharmaceutical companies.

“Rising to the challenges and needs of the chemical industry”

The second day of CEBC’s Fall 2025 IAB meeting featured this special focus on the chemical industry. To kick off the workshop, a panel discussion on the title topic was led by current Industry Advisory Board (IAB) members Dr. Paul Bloom (Gevo, Inc.), Dr. Jose Leboeiro Hernandez (ADM) and Dr. Jerry Springs (Johnson Matthey). Former IAB member Dr. Cathy Tway of BP, CEBC Education and Outreach Director Dr. Ana Chicas-Mosier, and guest speakers Dr. Tony Boccanfuso of University-Industry Demonstration Partnership (UIDP) and Dr. Jasmin Patel of Science Coach gave presentations geared toward identifying and closing gaps for workforce development in the chemical sciences. KU administrators Adam Courtney, CEO of KU Innovation Park, Dr. Cliff Michaels, KU Center for Technology Commercialization Executive Director, and Jane New, KU Director for Industry Partnerships, joined for a university/industry collaborative session. The day-long workshop concluded with an overview of CEBC capabilities highlighting the research labs of 16 CEBC-affiliated faculty members.

Pharma/University Visioning Workshop

On November 12, CEBC hosted a similar workshop addressing specific challenges of the pharmaceutical industry. Representatives of AbbVie, American Chemical Society Green Chemistry Institute, Amgen, Bristol Myers Squibb, Cambrex, Eli Lilly and Sanofi gathered online for a two-hour virtual workshop. The agenda included a presentation and panel discussion on workforce development needs in pharma, information briefs by CEBC researchers on key areas of research expertise relevant to pharma, and panel discussion on “Pharma Industry/University Engagement.” CEBC’s then-Deputy Director Alan Allgeier, Education & Outreach Director Ana Chicas-Mosier, and Chemistry Professor Jon Tunge made presentations and led the panel discussions.

Networking Opps: Conferences

January

Bioinorganic Chemistry Gordon Research Seminar Ventura, CA

Students: Zahra Aghaei, Markell Lomax

February

29th Organic Reaction Catalysis Society (ORCS) Conference, Myrtle Beach, SC

Faculty: Dr. Alan Allgeier; Student Samir Castilla

March

American Chemical Society (ACS) Spring Meeting San Diego, CA

Postdoctoral Researcher Dr. Kinithi Wickramaratne
Student Deshkanwar Brar

May

ACS Spring 2025 Kansas Physical Chemistry Symposium Midwest Theoretical Chemistry Conference, Detroit, MI

Students: Shreyaa Brahmachari, Emmanuel Forson, Taylor Parsons

June

North American Catalysis Society NAM29, Atlanta, GA

Faculty: Drs. Alan Allgeier, Juan Bravo-Suárez & Bala Subramaniam
Associate Researcher Dr. Hongda Zhu; Postdoctoral Researchers: Drs.
Nakisha Mark & Hongda Zhu; Students: Hashim Alzahrani, Samir Castilla,
Bhagyeshya Patil, Odiri Siakpebru & Alejandra Torres-Velasco

29th Annual Green Chemistry & Engineering Conference Pittsburgh, PA

Faculty: Drs. Aaron Scurto & Bala Subramaniam; Postdoctoral
Researcher Dr. Preeti Jain; Student Samir Castilla

July

ACS Green Chemistry Institute, Green & Sustainable Chemistry Summer School, University of Vermont, Burlington, VT

Postdoctoral Researcher Dr. Preeti Jain

International Conference on Biological Inorganic Chemistry Long Beach, CA

Students: Zahra Aghaei, Markell Lomax, Anagha Puthiyadath

Raise Summit, Paris, France

Faculty Dr. Kevin Leonard

Students: Shelby Atherton, Brianna Farris & Josena Frame

August

ACS Fall National Meeting, Washington, DC

Students: Shelby Atherton, Brianna Farris, Prathusha Kothinti
& Jared Schaeffer

Great Plains Catalysis Society (GPCS) Symposium, Ames, IA

Faculty Dr. Alan Allgeier; Postdoctoral Researcher Dr. Apoorva Ranjekar;
Students: Hirushan Hetti Arachchige, Samir Castilla, Nadith Dissanayake,
Tom Gonzales, Prathusha Kothinti, Alejandra Torres-Velasco

KU REU Symposium, Lawrence, KS

Undergraduate Students Morgen Keller & Tej Maheshwari

October

ACS Midwest Regional Meeting, Columbia, MO

Students Hirushan Hetti Arachchige & Deshkanwar Brar

November

American Institute of Chemical Engineers (AIChE) Annual Meeting Boston, MA

Faculty: Drs. Alan Allgeier, Aaron Scurto & Bala Subramaniam
Graduate Students: Diego Melfi, Paul Nyankey, Alejandra Torres-Velasco &
Fernando Zea; Undergraduate Students: Morgen Keller, Tej Maheshwari

Outreach Events

The secret life of spices at Carnival of Chemistry

CEBC postdocs Nakisha Mark (far right), Sahil Kumar (back) and Priyanka Pal (not pictured) demonstrated differences in pH and scent of locally and internationally sourced spices at the annual KU Carnival of Chemistry. Their experiments captured the interest of both the kids and adults, who learned how compounds in spices contribute to the spice's pH, and how the compounds' volatility enables the aroma of spices to be smelled. As a bonus, prizes were given to increase excitement and encourage STEM learning among the kids.



Taking science on the road

Dr. Ana Chicas-Mosier led a group of volunteers who hosted several sessions at the Housing Authority, engaging k-12 kids in diverse experiments. The participants learned concepts from across the sciences, including biological sciences, physical chemistry and green chemistry. Experiments ranged from DNA extraction from strawberries to learning about solar energy by building a miniature solar car.



American Association for the Advancement of Science names four CEBC faculty as Fellows



Alan Allgeier

Professor of Chemical Engineering

- American Chemical Society (ACS) 2025 Annual Spring Meeting, San Diego, CA

Juan Bravo Suárez

Assoc. Professor of Chemical Engineering

- North American Catalysis Society NAM29, Atlanta, GA

Elizabeth Corson

Asst. Professor of Chemical Engineering

- 248th Electrochemical Society Meeting, Chicago, IL
- Collaborative Research Luncheon: Energy, KU Office of Research, Lawrence, KS
- NASA Glenn Research Center, Cleveland, OH

Ana C. Morais

Assistant Professor of Chemical Engineering

- Dept. of Chemical Engineering, Kansas State University, Manhattan, KS
- Dept. of Chemical Engineering, Washington University in St. Louis, St. Louis, MO
- Great Plains Catalysis Society (GPCS) Symposium, Ames, IA
- American Institute of Chemical Engineers (AIChE) Annual Meeting, Boston, MA
- Federal University of Santa Maria, Brazil, Porto Alegre

Bala Subramaniam

Distinguished Professor of Chemical Engineering

- Chevron Phillips Chemical Company, Bartlesville, OK
- American Chemical Society/Moore Foundation Visioning, National Academy of Sciences, Washington, DC

Chemistry professors Timothy Jackson, Ward Thompson, and Jon Tunge, and computer science professor Michael Branicky are among the 471 scientists, engineers and researchers named in the recently announced American Association for the Advancement of Science (AAAS) fellows 2024 class.

Timothy Jackson was recognized for distinguished contributions to the field of bioinorganic chemistry, particularly through the combined use of kinetic, spectroscopic and computational methods to develop electronic structure-activity correlations of bioinspired manganese complexes. As a CEBC faculty member, Tim has been a P.I. or co-P.I. on numerous collaborative projects, including the \$4.4 million NSF Networks for Sustainable Molecular Design and Synthesis program.

Ward Thompson was recognized for distinguished contributions in theoretical chemical dynamics and spectroscopy, including seminal studies on chemistry in nanoscale confinement and the calculation of activation energies. One of CEBC's first faculty members, Ward has participated in an ERC Thrust Group, a 2012 industry seed project, the NSF Networks for Sustainable Molecular Design and Synthesis program, and a DOE-funded project developing computer-based methods that explore the mysteries of catalysts supported on amorphous silica.

Jon Tunge was recognized for the advancement of critical synthetic strategies involving the environmentally benign formation and utilization of organometallics. Jon led one of the CEBC's first ERC Thrust Groups and developed a method for "polymer-bound" catalysts to be retained inside the reactor. Jon also was a key member of the NSF Networks for Sustainable Molecular Design and Synthesis program.

Michael Branicky was recognized for distinguished contributions to modeling, analysis and control of cyber-physical systems, and for applications to networked control systems and robotics. He is a former dean of the KU School of Engineering. He recently served as a faculty mentor for CEBC's National Science Foundation Research Traineeship (NRT) program. One of Michael's research interests involves cyber-physical systems, which are applied to a wide range of areas such as agriculture, energy, health care, manufacturing and transportation.

KU's inaugural gathering of AAAS Fellows

In November, the University of Kansas celebrated its 33 faculty members elected as Fellows of the American Association for the Advancement of Science (AAAS). Among them are CEBC faculty members Bala Subramaniam, Tim Jackson, Ward Thompson, Jon Tunge and Michael Branicky, plus CEBC research project collaborators Donna Ginther and Candan Tamerler.

Election as an AAAS Fellow is an honor in the scientific community, recognizing individuals who uphold the standards of professional ethics and scientific integrity. Before being nominated, AAAS membership must be maintained continuously for a four-year period leading up to a nomination by a fellow of the AAAS Council.

In addition to the 11 current and former CEBC faculty and collaborators who are AAAS fellows, former CEBC Science Advisory Board members Mahdi Abu-Omar, Rodney Fox, Ive Hermans, Umit Ozkan and Vincent Pecoraro also are fellows.

CEBC faculty receive research impact award from KU's Department of Chemistry

The KU Department of Chemistry recognizes one faculty member each month based on the peer-reviewed papers published by chemistry faculty from the three previous months, reviewed by the Chemistry Department Chair and Associate Chairs.

In 2025, seven CEBC faculty members' published works were selected for this recognition.

James Blakemore, Associate Professor, January
Timothy Jackson, Chair & Professor, March
Aaron Teator, Assistant Professor, June
Ward Thompson, Professor, August
Marco Caricato, Professor, October
Manar Shoshani, Assistant Professor, November
Rachael Farber, Assistant Professor, December

Brian Laird chosen for exclusive physics society fellowship

Dr. Brian Laird, KU chemistry professor and CEBC researcher, has been elected to Fellowship in the American Physical Society. The APS Fellowship recognizes members who have made exceptional contributions in the field of physics. Each year, no more than one-half of 1% of the society's membership (excluding student members) are elected to the status of Fellow. KU currently has three other active fellowship members on its faculty, all within the Department of Physics & Astronomy.

Laird, who also has been a courtesy professor in both physics & astronomy and chemical & petroleum engineering at KU, was chosen for his groundbreaking, interdisciplinary work developing algorithms for molecular modeling. The society stated, "For pioneering contributions to the use of atomistic simulation to study the equilibrium and nonequilibrium properties of interfaces and significant advances in the development of algorithms for molecular-dynamics simulation."

Computational modeling complements experimental work in physics, chemistry and engineering by providing a detailed understanding of how molecular-level interactions give rise to observable phenomena. The Laird research group has worked extensively with the CEBC, beginning with his participation in the ERC grant proposal leading to the center's inception. From 2013-2017, Laird was lead investigator on the \$4.4 million NSF Networks for Sustainable Molecular Design and Synthesis program with CEBC faculty members Drs. Bala Subramaniam, R.V. Chaudhari, Ward Thompson and Jon Tunge.

"To be recognized by the physics community as a chemist is quite an honor," Laird said. "I think it speaks to the interdisciplinary nature of my work."



Laird's Nobel Prize connection

A team of three scientists, including a former research colleague of Laird's, was chosen for this year's Nobel Prize in Chemistry.

Omar Yaghi, a professor of chemistry at the University of California, Berkley, and his colleagues were recognized for their work creating metal-organic frameworks that can be used to harvest water from desert air, capture carbon dioxide, store toxic gasses or catalyze chemical reactions. From 2009 to 2015, Laird was a co-principal investigator with Yaghi on an Energy Frontier Research Center funded by the Department of Energy, an association that, Laird said, makes him "Nobel-adjacent along with many other people." Said Laird, "My role was to take the materials he had and do computational predictions of the absorption of carbon dioxide and methane."



Marco Caricato

Professor of Chemistry

- ACS Fall Meeting, Washington, DC
- University of Louisville, Louisville, KY

Rachael Farber

Assistant Professor of Chemistry

- ACS Midwest Regional Meeting, Columbia, MO
- University of Regensburg, Germany
- Brandenburg University of Technology Cottbus-Senftenberg, Germany
- ACS 2025 Spring Meeting, San Diego, CA

Tim Jackson

Department Chair & Professor of Chemistry

- International Conference on Biological Inorganic Chemistry, Long Beach, CA

Manar Shoshani

Assistant Professor of Chemistry

- Kansas State University Seminar, Manhattan, KS
- Canadian Society of Chemistry Conference, Ottawa, Ontario
- ACS Midwest Regional Meeting, Columbia, MO
- Periodic Tables Talk, online

Jon Tunge

Professor of Chemistry

- Great Plains Catalysis Society (GPCS) Symposium, Ames, IA
- Columbia University: Norton Symposium, New York, NY

Congratulations 2025 Graduates

Ph.D. in Chemistry

Deshkanwar Brar

Advisor, Jon Tunge

Now a postdoctoral researcher at University of Georgia

Rafael Diaz Hernandez

Advisor, Jon Tunge

Now an assistant laboratory professor at Middlebury College

Taylor Parsons

Advisor, Marco Caricato

Kasun Wekasinghe

Advisor, Aaron Teator

Now a postdoctoral researcher at the University of Kansas



Ph.D. in Chemical Engineering

Brianna Farris

Advisor, Kevin Leonard

Now co-founder of Electravaera

Bhagyesha Patil

Advisor, Juan Bravo-Suárez

Now an adjunct researcher at CEBC/KU

Darik Rosser

Advisor, Kevin Leonard

Now a postdoctoral researcher for CEBC and Avium, LLC

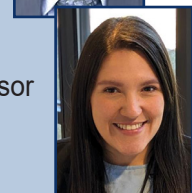
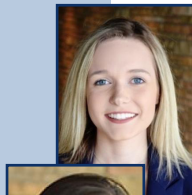
Odiri Siakpebru

Advisor, Ana Morais

Alejandra Torres Velasco

Advisor, Juan Bravo-Suárez

Now a teaching assistant professor at University of Pittsburgh (PA)



Trainees receive awards, scholarships

American Chemical Society

Leadership in the Promotion of Research Safety

Shelby Atherton (PhD student) Advisor: Kevin Leonard

Nakisha Mark (postdoc) Advisor: Bala Subramaniam

Leadership in the Promotion of Inclusion & Belonging

Darik Rosser (PhD student) Advisor: Kevin Leonard

Alejandra Velasco Torres (PhD student) Advisor: Juan Bravo-Suárez

Leadership in Mentoring

Samir Castilla (PhD student) Advisor: Alan Allgeier

American Institute of Chemical Engineers (AIChE)

Undergraduate Student Poster Competition, Boston, MA

Tej Maheshwari Advisor: Elizabeth Corson

2nd Place in Catalysis and Reactor Engineering

Great Plains Catalysis Society (GPCS)

Annual Symposium, Ames, IA

Hirushan Hetti Arachchige (PhD student)

pictured with award

Advisor: Rachael Farber

Best Oral Presentation

Prathusha Kothinti (PhD student)

pictured with award, left

Advisor: Alan Allgeier

Best Poster Presentation

Outstanding Oral Presentation

Samir Castilla (PhD student)

pictured with award, right

Advisor: Alan Allgeier

Best Oral Presentation

Outstanding Poster

Presentation

Other Scholarships & Fellowships

Aadhya Bhatia (undergraduate) Advisor: Manar Shoshani

Millenium Scholarship, KU University Scholars Program

Helinna Bontrager (undergraduate) Advisor: Manar Shoshani

Millenium Scholarship, KU University Scholars Program

Samir Castilla (PhD student) Advisor: Alan Allgeier

Travel Award, Organic Reaction Catalysis Society

Nora Jennings (undergraduate) Advisor: Bala Subramaniam

KU Millennium Fellows Campus Hub Director

Morgen Keller (undergraduate) Advisor: Elizabeth Corson

KU Center for Undergraduate Research & Fellowships

Isabelle Schiedel (undergraduate) Advisor: Manar Shoshani

KU Edwin Emery Slosson Scholarship in Science, Phi Kappa Phi Honor Society invitation & membership



KU Departmental Recognition of Trainees

Chemical & Petroleum Engineering

Dacosta Osei *Advisor: Ana Morais*, Outstanding MS Research Award

Nigel Twiyeboah *Advisor: Alan Allgeier*, Outstanding MS Research Award

Alejandra Torres Velasco (graduate) *Advisor: Juan Bravo-Suárez*, 2024-2025 KU Graduate Teaching Assistant Award, KU Graduate School

Chemistry

Chemistry Top Overall Awards in Organic Chemistry

Davis Curry *Advisor: James Blakemore*, Ernest & Marvel Griswold Award

Kasun Wekasinghe *Advisor: Aaron Teator*, Frank B. Dains Award

Chemistry Awards & Scholarships

Zahra Aghaei *Advisor: Tim Jackson*, Burton & Cheryle MacKenzie Scholarship; Wilson Graduate Summer Scholarship

Hirushan Hetti Arachchige *Advisor: Rachael Farber*, Cross Summer Scholar

Elizabeth Bartlett *Advisor: Ward Thompson*, Charles & Beatrice Kulier Scholarship

Shreyaa Brahmachari *Advisor: Marco Caricato*, Cornelius McCollum Research Scholarship

Fynn Cooper *Advisor: James Blakemore*, Burton & Cheryle MacKenzie Scholarship

Alex Ervin *Advisor: James Blakemore*, Drs. Walter & Roy Cross Memorial Award

Emmanuel Forson *Advisor: Marco Caricato*, Charles & Beatrice Kulier Scholarship

Fernando Gonzales *Advisor: Manor Shoshani*, Ralph E. & Esther Weik Badgley Scholarship; George Corbin Bailey Memorial Scholarship

Natalie Lind *Advisor: James Blakemore*, Elmer McCollum Research Scholarship

Lindsey Penland *Advisor: Rachael Farber*, Drs. Walter & Roy Cross Memorial Award

Anagha Puthiyadath *Advisor: Tim Jackson*, Bijan & Mary Taylor Amini Scholarship

Where in the **WORLD** are the CEBC alumni?

Sam Brunclik *Ph.D. 2024 Chemistry (adv. Jackson)*, Assistant Professor at College of Saint Benedict and Saint John's University, St. Joseph, MN

Dupeng Liu *PhD Chemical Engineering 2017 (adv. Subramaniam) & Postdoc 2018-2021*, Founder & CEO TrusOne, Berkeley, CA; earned MBA from University of California Berkeley 2025

Apoorva Ranjekar *Postdoc 2023-2025*, Postdoctoral Researcher with the Wonderful Institute for Sustainable Engineering (WISE) at KU

Wei Ren *PhD Chemical Engineering 2010 (adv. Scurto)*, Future Operations Manager, ExxonMobil, Spring, TX

Shazia Satter *Postdoc 2021-2022*, Air Resources Engineer, California Air Resources Board, Sacramento, CA

Ravi Teja Addanki *Postdoc 2024-2025*, Research & Development Scientist at Clemson University

Anoop Uchagawkar *PhD Chemical Engineering 2022 (adv. Subramaniam) & Postdoc 2022-2025*, Process Development Engineer, ExxonMobil, Spring, TX

Nan Wang *PhD Chemical Engineering 2021 (adv. Weatherley)*, Senior Scientist at AbbVie

Congratulations 2025 Graduates

Masters Degrees

**Mohammad Abazid, M.S.
Chemical Engineering**

Advisor, Elizabeth Corson

Now at Becton, Dickinson (BD),
Karlsruhe, Germany

Markell Lomax, M.S. Chemistry

Advisor, Tim Jackson

Now employed by Thermo
Fisher Scientific, St. Louis, MO

**John Styers, M.S.
Chemical Engineering**

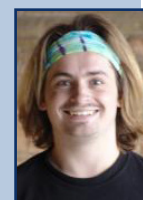
Advisor, Alan Allgeier

Now pursuing PhD in Chemical
Engineering at KU

**Nigel Twi-Yeboah, M.S.
Chemical Engineering**

Advisor, Alan Allgeier

Now employed by Nextera
Energy Resources



Dr. Sandip Singh, CEBC associate researcher, is among The Stanford University/Elsevier Top 2% Scientists List for 2025. The publication includes Dr. Singh as an elite scientist with significant global impact. Published annually, the report uses data from Scopus to identify 100,000-200,000 top scientists worldwide, based on citation metrics across 22 scientific fields and 174 subfields.

Singh Among World's Top Scientists



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Complete list at
www.cebc.ku.edu/publications

