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CHEMICAL AND BIOLOGICAL ENGINEERING

Fall 2025

A Newsletter for Friends and Supporters of the Mines CBE Department



CONTENT

3Fabulous Fall
5Awards and Honors
6What are they up to?
8Department Happenings
9CBE Ambassadors
12Undergrad recognition
14Alumni updates

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Linked In: Mines Chemical and Biological Engineering Department

Email: CBE@mines.edu

Alumni! We'd love to hear from you, send us an email or connect with us on LinkedIn and let us know what you're up to.

On the cover: Alderson Hall's stained glass wall - photo by Laura Ragsdale

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FALL 2025

A newsletter for friends & supporters
of the Colorado School of Mines Department of
Chemical and Biological Engineering

Newsletter created by Laura Ragsdale, Program Assistant

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A fabulous fall in CBE

Dear friends and supporters of Mines Chemical and Biological Engineering,

As we begin a new year, this edition of our newsletter looks back at the second half of 2025 and all we have accomplished and experienced.

Many of our faculty received awards and grants to continue their research. Alexander Pak and Ramya Kumar were both awarded MIRA awards from the National Institute of Health, a first for researchers at Mines.

Undergraduate and Graduate students continued their efforts to foster community and growth in the CBE department culture, with their respective student groups, the CBE Ambassadors and CEQA.

We named our Outstanding Graduating Senior, Cole Kics and celebrated with the rest of the December graduates. Kayley Sefcik was selected as our Outstanding TA in CBE.

Recent PhD graduate from CBE Xue Wang was named both the CBE Outstanding Graduating Thesis Award and the Mines Rath Award. CBE Undergraduates continue to impress at the Research Symposium.

Read about all of these accomplishments and more in this edition of our newsletter, and we hope to hear about more amazing accomplishments in Spring 2026!



Faculty Awards and Honors

Congratulations to Alexander Pak and Ramya Kumar. These CBE professors both recently won National Institutes of Health MIRAs for early stage investigators!

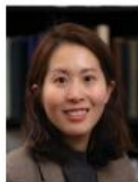
- Dr Pak was awarded \$1.7M for 5 years
- Dr Kumar was awarded \$2M for 4 years

Sponsored by the National Institute of General Medical Sciences (NIGMS), the **MIRA (Maximizing Investigator's Research Award)** is awarded to promising early career researchers, providing them with stable and flexible funding to encourage innovation and drive scientific breakthroughs in basic biological and medical science.

This is the first time Colorado School of Mines researchers have won the prestigious MIRA and Nanette Boyle, department head of Chemical and Biological Engineering at Mines said, "The MIRA is a highly competitive award, and to have two faculty members in our department win it in the same year is extraordinary. These awards recognize the creativity and vision that Dr. Kumar and Dr. Pak each bring to their research."



[Learn more about the research these MIRAs will support by clicking here >>](#)



Stephanie Kwon received funding from NSF National Science Foundation for their project titled "*Collaborative Research: Catalysis on crowded surfaces: the effects of co-adsorbates on CO and CO2 hydrogenation mechanisms.*" Award: \$344,016.00



Kevin Cash received funding from DOE Office of Science for their project titled "*Nano Sensor Development.*" Award: \$144,367.00

Faculty Awards and Honors



Carolyn Koh received funding from GPA Midstream Association for their project titled "*TSA: Water Content of CO2 Streams from CCUS Processes.*" Award: \$200,973.00

Diego Gomez-Gualdron was awarded an NSF grant titled "*CDS&E: Transferable machine learning (ML) potentials to enable ML-based screening of adsorbents for separations involving chemisorption.*"



Colin Wolden received funding from DOE Office of Science for their project titled "*Direct Internal Recycling for High Field and Spherical Tokamaks.*" Award: \$2.6M for 5 years

Lam Research was honored by the Colorado School of Mines (Golden, Colo.) for contributing more than \$1 million in academic research funding to the university in the past 10 years. Lam's philanthropic contributions, guided by Lam's Etch Product Group and Deposition Product Group (DPG), included the following:

- Approximately \$900,000 in donations for research between Lam's dielectric etch group and Dr. **Sumit Agarwal**, professor of chemical engineering.
- \$75,000 in donations from Office of the CTO (OCTO) for research with Dr. **Agarwal** as part of three Unlock Ideas projects in 2015 and 2016.
- More than \$300,000 in funds from dielectric etch and dielectric deposition groups within Lam for research with Dr. **Agarwal** under sponsored research or services agreements.



What are they up to?

The ACS journal *Energy and Fuels* has honored E. Dendy Sloan as a Pioneer in Energy Research (PIER)



Professor E. Dendy Sloan from the Colorado School of Mines, United States, has been selected as the 2025 PIER of gas hydrates research in the field of unconventional energy sources for his outstanding contributions to gas hydrate kinetics and the development of hydrate kinetic inhibitors.

Below is an excerpt from Q&A with Prof. E. Dendy Sloan | *Energy & Fuels*

WHAT MADE YOU INTERESTED IN AND DECIDED TO MOVE INTO GAS HYDRATES RESEARCH? COULD YOU PLEASE TAKE US THROUGH THE EVOLUTION OF THIS TOPIC AS YOU STARTED WORKING IN THIS AREA?

During my career, a nation's gross national product per capita was approximately proportional to that nation's natural gas energy expenditure. The initial 1974 challenge was to enable natural gas to flow unhydrated from permafrost regions, like the North Slope, to warmer, more populated climates. The projects were challenges initially with meager funding for investigation.

It was an existential pleasure to learn at the fundamental, molecular level about microscopic phenomena, which stretched my ability. It was also good to know that industry was willing to support "having fun" with molecules, if I could provide a bridge to macroscopic applications such as energy flowlines and reservoirs. Seen objectively, this seems strangely like an elder version of "playing with blocks", which proved useful to society.

[CLICK TO READ MORE](#)

Greco González Miera

Energy & Fuels 202539(47), 22461-22462 DOI: 10.1021/acs.energyfuels.5c05391

What are they up to?



Designing Structured Courses for ChemE Student Success

Course design can be difficult but with practice comes better course designs and thus better student outcomes. Introducing Alignment: A Course Design Deck which **Justin Shaffer** designed to help give instructors practice at designing courses via aligning assessments and activities to learning objectives and tailoring this process to specific course design situations and figuring out how to overcome barriers. And now there's a deck for student's too! Practice: A Student Success Card Deck is designed to help give high school and college students a way to explore effective study strategies and how to apply them to a variety of courses and topics. Additionally, this deck will help students learn how to overcome barriers to studying and pursue overarching skills that will lead to success.

<https://www.recombinanteducation.com/cards/>



Professor of Practice **John Jechura** was in Houston this semester as part of a three-person team teaching the GPSA Engineering Data Book training for GPA Midstream. This has proven to be a very popular event for the GPA & well attended by people from industry. This year's event has proved to be very well attended – the original 30 person limit was expanded to 42.

CBE photos



Bean and David Bowle



Mac



Sora and Noona



Bailey

Match the pets to the professor



Prof Pak



Prof Crane



Prof Wolden



Prof Morrish

A BLAST FROM CBE'S PAST

Do you recognize our beloved Alderson Hall in this photo? This is before the lab wing was built.



CBE Ambassadors



CBE AMBASSADORS ARE ON A ROLL

The CBE Ambassadors program has been reignited! Started initially in 2019 as a collaboration between CBE students, faculty and staff, the CBE Ambassadors program aims to enhance the student experience in CBE.

The group consists of ~20 CBE student volunteers from all class levels who have applied and been accepted based on their interest in helping/leading initiatives chosen by the group and supported by the department. The Ambassadors work closely with department faculty and staff, for example to host outreach and social events; tutoring sessions for core CBE courses; and myth-busting discussions where "seasoned" students help underclass students better understand elective options, what Field Session is really like, etc.

Other initiatives have included transfer student support; a CBE-specific Philanthropy Tank event; CBE Smiles, where students took pictures of CBE students, faculty, and staff having fun and shared them on social media. The group is also currently working on a challenge to design a "CBE Demo Kit" of objects, media, etc. that can show interested people of all ages (K-12, prospective freshmen, current Mines students, etc.) what Chemical and Biological Engineering is.

Future initiatives will include connecting with alumni as well. The program provides a great opportunity for students, faculty, and staff to work together to help improve the daily experiences of all of the CBE family.

If you are interested in learning more about the CBE Ambassadors, or in connecting with us in any way, please reach out to Dr. Tracy Gardner (tgardner@mines.edu) or Laura Ragsdale (laura.ragsdale@mines.edu). We'd love to hear from you!

CBE Ambassadors



Mkari, Mia, and Ashley - CBE Ambassadors in its first year back up and running, at graduation with their alumni hats and CBE Ambassador cords.



We hosted some Board Gaming events! Sometimes it IS all fun and games.



A good time was had by all at Pizza with the Profs!



CBE Ambassadors Davin and Yoshi helping out at a Majors Fair event



Undergraduate Student Updates



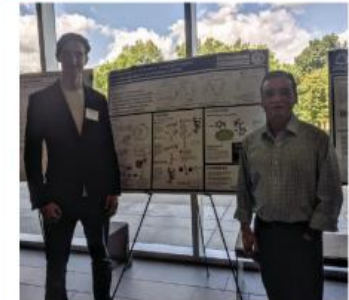
Karsten Kunneman, a Chemical Engineering senior, presented his research, "A Lightweight, Open-Source Web Application to Simulate the Equilibrium and Inhibition of Clathrate Hydrates Using Existing Models and Techniques," at the 2025 AIChE Annual Student Conference in Boston, MA.

Omar Mansurov, a Chemical Engineering senior, presented his research at the 2025 AIChE Annual Student Conference in Boston, MA. His research presentation was titled "Construction of Chemistry-Independent Representations for Gas Adsorption Prediction in Metal-Organic Frameworks."



Chemical Engineering senior **Caroline Hufnagel**, who working with professor Colin Wolden, attended the AVS Symposium in Charlotte in September and presented her first paper: C. L. Hufnagel, V. Camacho, T. F. Fuerst, A. Rutkowski, J. D. Way, and C. A. Wolden, "The impact of argon addition on hydrogen superpermeation through palladium alloy metal foil pumps during direct internal recycling," Fusion Engineering and Design 222, 115428, (2026).

Congrats! Undergraduate Research Symposium Winners



CONGRATULATIONS TO THE 2025 FALL UNDERGRADUATE RESEARCH SYMPOSIUM POSTER WINNERS!

#1 Tie | Emma Bateman, Senior, EDS | Mentor: **Melissa Krebs, Ph.D., CBE** | Designing Localized Drug-Delivery Solution for Women's Health

#1 Tie | Wyatt F. Brooks, Senior, CH | Mentor: C. Michael McGuirk, CH | Controlling Zirconia Crystallization Towards the Synthesis of Phase Pure Polyethylene Depolymerization Catalysts

#2 | **Micah Zumtobel, Junior, CBE** | Mentor: Shubham Vyas, CH | Python-Driven Benchmarking of EPR Parameters for Fluorinated Species: Using Spin Traps to Investigate Degradation Mechanisms of Diverse PFAS Molecules?

#3 | Caitlyn Castellion, Junior, CH | Mentor: **Ramya Kumar, CBE** | Sulfonated Polymer Brushes Sequester Fibroblast Growth Factors and Promote Human Mesenchymal Stem Cell Proliferation



Congrats!

**Outstanding Graduating Senior
Cole Kics**



Kics, of Shorewood, Illinois, will work in the pharmaceutical industry before considering graduate school in a few years.

Favorite Mines memory: Trips to the mountains with new friends and communities.

**Outstanding TA in CBE
Kayley Sefcik**



Sefcik was our TA for 3 sections of CBEN 314 - she did an excellent job of surveying the sections at the start of the semester to see what times would work best for the most students, and was still willing to have students email her with questions. She held recitations and went above and beyond in her TA duties!

Melissa Krebs, associate professor of Chemical and Biological Engineering, has been inducted into the American Institute for Medical and Biological Engineering College of Fellows.

AIMBE membership honors those who have made outstanding contributions to "engineering and medicine research, practice, or education" and to "the pioneering of new and developing fields of technology, making major advancements in traditional fields of medical and biological engineering or developing/implementing innovative approaches to bioengineering education."

Professor Krebs was nominated, reviewed, and elected by peers and members of the College of Fellows "for pioneering advancements in cell-interactive biomaterials and clinical translation specifically in regenerative medicine and drug delivery technologies."



Congrats to our most recent graduates!

Adrian Mendonsa - PhD - Cash Lab

Joshua Worley - PhD - Koh Lab

Chelsea Johansen - PhD - Farnsworth Lab

Joseph Briggs - PhD - Koh Lab

Yuanxing Zhang - PhD - Wu Lab

Xue Wang - PhD - Agarwal Lab

Sean Mathews - MS - Wolden Lab

and Cameron Burst - MS - Wolden lab

**CBE's Outstanding Graduate Thesis
& Mines' Rath Award Winner**

XUE WANG



Xue graduated in August of 2025 and is currently working as a Process Engineer at Lam Research Corporation.

His thesis was titled Understanding of Plasma-Surface Interactions During Plasma Etching of Dielectrics for Semiconductor Device Fabrication.

Xue's dissertation directly addresses challenges associated with fabrication of next-generation computer chips, which will be increasingly challenging to manufacture as the critical dimensions become less than two nanometers.

Xue was also named the Fall 2025 Rath Award winner! This prestigious honor recognizes the doctoral graduate whose thesis holds the greatest potential for lasting societal impact.

Congratulations Xue on this amazing achievement!



Alumni Updates

CBE ALUM NAMED DISTINGUISHED RESEARCHER

Undergraduate alumna **Courtney Smoljan** (B.S. graduate, class of 2021 and current Ph.D. Candidate at Northwestern University, expected 2026). Courtney recently won the Distinguished Graduate Researcher Award, which is the highest honor and distinction that a Northwestern graduate can achieve!

Courtney used to intern at NREL and has been mentored by Nicholas Thornberg, adjunct professor in CBE, since 2020.

Courtney said on LinkedIn of the award - "I am honored to share that I was selected as the Distinguished Graduate Researcher in the Department of Chemical & Biological Engineering at Northwestern University. As the recipient of this award, I had the opportunity to talk about my research on "Designing Stable Metal–Organic Frameworks with Sub-Angstrom Pore Control" at the department retreat today. I am so thankful to have had the opportunity to study at Northwestern in the groups of Randy Snurr and Omar Farha and for all of the collaborators and friends that have made this such an amazing place to get a Ph.D."



CBE Senior Lief Ritter on campus with his giant pumpkin, weighing 1,579 pounds

Check it out!



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Support Chemical and Biological Engineering

A gift to the Colorado School of Mines Chemical and Biological Engineering Department helps our students succeed.

Gifts can support fellowships, academic programs, student research, upgrades to equipment and other initiatives.

To learn more about supported our department, visit weare.mines.edu or reach out to the Mines Foundation.

Guess the pet answers:

1. Crane 2. Morrish 3. Pak 4. Wolden

