In This Issue

A Message from Our Directors: Thank You for Attending the Site Visit!

“The EARTH Industry Day and NSF site visit was a tremendous success. Held at the new University of Kansas David Booth Memorial Football Stadium and Conference Center on October 20–21, the event brought together faculty, students, and staff from the University of Kansas, University of Notre Dame, University of Maryland, University of Hawai‘i, University of South Dakota, Lehigh University, University of Iowa, University of Delaware, and Howard University. We were also joined by member companies, community colleges, and professional organizations.

Over the course of the two days, attendees participated in twenty-two lectures, fifty-five poster presentations, and several breakout sessions with our industry partners. Thanks to the whole team for a great fall meeting.

We are excited to welcome you all to the University of Notre Dame in the spring. Please reserve Wednesday, March 11 through Friday, March 13 on your calendars to allow for travel time. More details to come in the new year.”

—Mark Shiflett, Center Director and Jennifer Schaefer, Deputy Director

Exit Survey

Upcoming Webinar

Join us on **November 12 at 2 pm CT / 3 pm ET** for our next installment of the 2025 Webinar Series! Our speaker will be **Dr. Xudong Wang**, the Vice President of Research at The Air-Conditioning, Heating, and Refrigeration Institute (AHRI). **Registration is required to attend the event.** See you then!

Register Here

Convergent Research

New Publications

**Corresponding author(s); ASAP: As Soon As Publishable*

Optimization of Heat Transfer Mechanisms in Elastocaloric Cooling Systems

Het Mevada, Yunho Hwang*, and Ichiro Takeuchi

Int. J. Refrig. **2025**, *180*, 407–415
DOI: 10.1016/j.ijrefrig.2025.09.022



Read the Article

Activation and Functionalization of Organic Disulfides by Bis(Perfluoroalkyl) Complexes of Nickel(II)

Cherry Mae T. Ravidas, Roger E. Cramer, and David A. Vicic*

Organometallics **2025**, *44*, 2295–2300
DOI: 10.1021/acs.organomet.5c00310


Read the Article

Gas Chromatography Methods for the Efficient Separation of Multicomponent Refrigerant Blends of Hydrofluorocarbons and Hydrofluoroolefins: R-404A, R-407C, R-410 A, R-507, and R-513A

Julia E. Espinoza Mejia, Abdulrhman M. Arishi, Evanna M. Dominic, Aaron M. Scurto, and Mark B. Shiflett*

Microchem. J. **2025**, *218*, 115439
DOI: 10.1016/j.microc.2025.115439





Read the Article

Enhanced Thermophysical Property Prediction with Uncertainty Quantification Using Group Contribution-Gaussian Process Regression

Barnabas P. Agbodekhe, Montana N. Carlozo, Dinis O. Abranches, Kyla D. Jones, Alexander W. Dowling*, and Edward J. Maginn*

Mol. Syst. Des. Eng. **Article ASAP**
DOI: 10.1039/D5ME00126A

Read the Article

Methodology Development for the Measurement of Refrigerant Flammability Limits

Kevin Turner, Arthur Benson, Michael Lundin, Ed Atchison, Dave Watson, Steve Campbell, Brian Finney, Glen Khlebutin, Riyaz Papar, and Mark B. Shiflett*

Ind. Eng. Chem. Res. **Article ASAP**
DOI: 10.1021/acs.iecr.5c01453

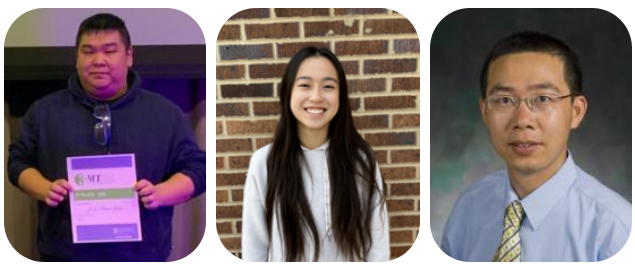
HUDSON TECHNOLOGIES®
Reclaiming the Future Together.

Read the Article

Covert and Multiplexed SERS QR Codes via Inkjet Printing

Zishen Yang*, Erin Schnetzer, Mary Tran, and Chaoyang Jiang*

J. Raman Spectrosc. **Article ASAP**
DOI: 10.1002/jrs.70061



Read the Article

Click here to see a list of all EARTH peer-viewed publications.

Please use the following statement in your publication acknowledgements.
"This research is based upon work supported by the National Science Foundation under award number **EEC-2330175** for the Engineering Research Center EARTH."

Member Achievements

Research Professor Yunho Hwang was named a recipient of the University of Maryland's 2025 Provost's Excellence Award for Professional Track Faculty. The award recognizes the excellence of his research contributions over his 32 years at the University of Maryland.

Professor Elaina Sutley, EARTH's Impact & Belonging pillar lead, won the 2025 Blavatnik National Award in Physical Sciences and Engineering, KU's first recipient of this prestigious honor. Her pioneering research uses advanced modeling to improve disaster resilience and housing recovery, shaping national building codes and safety policies.

Professor Nosang Myung received significant support from Notre Dame's Bioengineering & Life Sciences Initiative to lead ND-SCAN and co-lead ND-BIOSCOPE, two interdisciplinary projects addressing the opioid crisis and biological threat preparedness. His research was also featured recently in a "Fighting For" video.

Graduate student Julia Espinoza (Mark Shiflett's group) has been awarded $1,500 from KU's Doctoral Student Research Fund to support her research on refrigerant thermodynamics. Her research involves phase equilibrium and transport property measurements.

Professor Damena Agonafer received the Best Paper award at the Open Compute Project Global Summit in San Jose for his work on advanced evaporative cooling and dual-faced CDU integration, pushing the limits of energy-efficient thermal management in modern data centers.

Senior undergraduate Evanna Dominic (Mark Shiflett's group), majoring in chemical engineering and Spanish, has been selected for the prestigious 2025 Millennium Fellowship. Out of over 60,000 applicants worldwide, Evanna is one of 26 students from the University of Kansas chosen for this global leadership program.

Welcome, New EARTH Faculty!

Professor Joule Bergerson joined the University of Notre Dame to serve as the faculty director of ND Energy and was also appointed the inaugural Richard and Ellen Stanley Professor of Energy Systems Engineering in the Department of Chemical and Biomolecular Engineering. Joule is a leading expert in energy technology assessment. Her research helps to inform infrastructure and investment decisions and energy innovations in the global effort to aggressively reduce greenhouse gas emissions.

ND Profile

Google Scholar

Professor Zuxiao Zhang joins us from the University of Hawai'i at Mānoa in the Department of Chemistry. Zuxiao's lab focuses on pioneering catalytic systems to transform abundant chemical feedstocks into high-value building blocks, with applications in medicinal chemistry and drug functionalization. He is joining Thrust 1 Project 1.3.

Group Website

Google Scholar

Professor Yiling Nan joins us from the Department of Chemical and Petroleum Engineering at the University of Kansas. Her research spans computational molecular modeling, polymer chemistry, and fluid transport in nano-confined spaces. She is joining Thrust 1 Project 1.1.

KU Profile

Google Scholar

Engineering Workforce Development

Outreach

Lehigh University **Professor Elizabeth Young** and her team of graduate students recently visited a daycare near the university to introduce preschoolers to Earth science topics. Experiments involved making a cloud in a bottle, a rain cloud using shaving cream, exploring

what influences soil erosion, and making fossils from coffee grounds. Dr. Young and her group design the outreach experiments with different science themes in mind and has been continuously engaging in science outreach since the Young Group has been at Lehigh. Graduate students on Dr. Young's team will be infusing refrigeration and heating related themes to introduce the *cool* science behind the HVACR industry.

The KU Council of Students, led by graduate students **Julia Espinoza** and **Emmanuel Ababio**, represented EARTH at the Student Organization Reverse Career Fair in September. The event provided a great opportunity to share EARTH's mission of promoting sustainable HVACR technologies and environmental awareness with visiting employers. Representatives from companies such as Frito-Lay and Terracon stopped by to learn more about the organization's ongoing initiatives. The event successfully highlighted EARTH's commitment to sustainability while strengthening its presence within the KU engineering community.

The Adventures of EARTH Man

Celebrate the season with a spooky new issue of The Adventures of EARTH Man! Visit our website to explore this month's comic and catch up on past adventures that bring sustainability and engineering to life.

Announcements and Reminders

Did you know that an EARTH Convergent Research (CR) Meeting Calendar is maintained in the shared Google folder? You can view the entire 2025 calendar here!

Upcoming Meetings

October 30: Thrust 1 (3 pm ET), Crosscut 2 (4:30 pm ET)
November 2–6: AIChE Conference, Boston, MA
November 6: Thrust 2 (3 pm ET)
November 7: Project 3.1 (4 pm ET)
November 13: Thrust 3 (3 pm ET)

ASHRAE Society Scholarships

Due December 1

Presidents Scholarship • Engineering Technology Scholarships •
Undergraduate Engineering Scholarships • University-Specific Scholarships •
ASHRAE Society Chapter Scholarships • Regional Scholarships

Connect with EARTH on Social Media

About Us | Contact Us

The Environmentally Applied Refrigerant Technology Hub (EARTH) is working to create sustainable, accessible refrigeration and air conditioning innovations that will improve the quality of life for all Americans and secure U.S. leadership in workforce development and manufacturing.