



# WELCOME TO EARTH



## Environmentally Applied Refrigerant Technology Hub

stay *fresh* on upcoming events, surveys, publications, and more!

### Our Pillars



Convergent  
Research



Innovation  
Ecosystem



Engineering  
Workforce  
Development



Impact and  
Belonging

### Our Directors



**Mark B. Shiflett**  
Center Director  
U. Kansas



**Jennifer L. Schaefer**  
Deputy Director  
U. Notre Dame

### The News, Distilled

**Meet  
Crosscut 2**

**Mental Health  
Awareness Month**

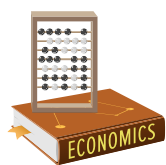
**Visit to  
Penn Tech**

**Outreach  
UMD & KU**

**EARTH Man  
Comic**



**Read More!**



**We will impact the engineering and scientific communities, the HVACR industry, and society!**



# Meet Behavior & Policy Crosscut 2!



## Jessecae Marsh

Associate Professor of Psychology  
Associate Dean for Interdisciplinary Programs  
& International Initiatives  
Lehigh University; [jessecae.marsh@lehigh.edu](mailto:jessecae.marsh@lehigh.edu)



Dr. Jessecae Marsh is a cognitive psychologist who studies how people's beliefs influence the way they reason and make decisions. She is specifically interested in how people think about cause and effect relationships. She applies her research focus into real world domains. For example, she has studied how the way people think about the causal basis of a disease influences the treatments they think will work for that disease. She has also explored how providing people with causal representations of how things interact in a domain can influence a person's likelihood to make a good decision. As part of the EARTH team, she is excited about understanding how people's causal knowledge about the relationship between refrigerants and the environment influences their decision making. For example, if a technician believes that they have a very small causal role in the larger issue of climate change, does this make them more likely to vent refrigerants rather than correctly capture them? Likewise, would providing causal explanations of how a new refrigerant technology helps the environment help people overcome any price concerns and adopt a new technology? She is excited to bring the human side to EARTH.



## Dietrich Earnhart

Associate Professor of Economics  
Director of Center for Environmental Policy  
& Undergraduate Studies  
University of Kansas; [earnhart@ku.edu](mailto:earnhart@ku.edu)



My expertise focuses on regulated companies' efforts to comply with environmental protection requirements and regulatory agencies' efforts to induce this compliance. I wish to contribute by constructing conceptual frameworks that explain households' and companies' decisions to manage their use of refrigeration and air conditioning and implementing empirical frameworks to estimate the relationships associated with these same decisions.

# Meet Behavior & Policy Crosscut 2!



## Joseph Kantenbacher

Associate Professor of Sustainability & Environment  
University of South Dakota;  
[joseph.kantenbacher@usd.edu](mailto:joseph.kantenbacher@usd.edu)



I am an environmental social scientist. My scholarship focuses on how people understand environmentally oriented issues and how they can be motivated to work towards a more sustainable future. My research has two main branches. The first draws most heavily on psychology and sociology to characterize how people think about the environment, what they know or think they know and how that knowledge informs their behaviors. My work in this area has included travel and tourism, public policy support, and home energy conservation. The second branch of my research feeds into an area called futures studies. With this work, I try to understand how people, particularly young adults, think about the future and how these views influence their willingness to invest in the future. Across all my research, I use surveys and interviews most frequently.



## Jide Wintoki

Capitol Federal Professor of Finance  
Associate Dean of Graduate Programs  
University of Kansas; [jwintoki@ku.edu](mailto:jwintoki@ku.edu)



Professor Wintoki's research focuses on corporate and international finance, with a particular emphasis on corporate governance. He examines how boards of directors, executive compensation, employee networks, and legal environments shape firm value, corporate policy, and decision-making. He has also explored the financing of corporate R&D. As part of EARTH, he is especially interested in examining how investors react to the adoption of new technologies and how they incorporate this adoption into their environmental, social, and governance (ESG) analyses of the material risks and growth opportunities facing the HVACR sector.



ERC - EARTH



NSF ERC EARTH



@NSF-ERC-EARTH.BSKY.SOCIAL



NSF.ERC.EARTH



@NSFERCEARTH





# Meet Behavior & Policy Crosscut 2!



## Kieko Matteson

Associate Professor of History  
Department Chair of History  
University of Hawai'i at Mānoa;  
[kieko.matteson@hawaii.edu](mailto:kieko.matteson@hawaii.edu)



Born and raised in Vermont and with family ties in Hawai'i, Kieko Matteson developed an early interest in environmental history while hiking and birding in New England and the U.S. West. Later stints in France and Finland led her to explore the history of natural resource conservation and land use in Europe. Her book, *Forests in Revolutionary France: Conservation, Community, and Conflict 1669-1848* has been published in the Cambridge University Press Studies in Environment and History Series. Prior to joining the History Department, Dr. Matteson served as the Executive Director of the World History Association. She has also served as editor of the American Society for Environmental History and U.S. National Park Service's "Special History of World War II Activities in Pacific Island Park Units." During spring and summer 2013, Matteson was a Fellow at the Rachel Carson Center for Environment and Society in Munich, Germany.



## Bruce Huber

Professor of Law  
University of Notre Dame;  
[bhuber@nd.edu](mailto:bhuber@nd.edu)



Professor Bruce Huber's research explores environmental and natural resource law, focusing in particular on collective action problems and regulatory design. His work aims to surface politically viable regulatory approaches to modern industrial challenges. If you're curious about how environmental law works and how it might interact with your areas of research, please reach out.



ERC - EARTH



NSF ERC EARTH



@NSF-ERC-EARTH.BSKY.SOCIAL



NSF.ERC.EARTH



@NSFERCEARTH





# Meet Crosscut 2!



## Todd Watkins

Professor of Economics  
Executive Director, Martindale Center for the  
Study of Private Enterprise &  
Microfinance Program  
Lehigh University; [taw4@lehigh.edu](mailto:taw4@lehigh.edu)



Todd A. Watkins, PhD, is a policy economist focusing on the intersection of inclusive finance, sustainable economic development, and social entrepreneurship. His scholarship explores how financial tools can create pathways to economic opportunity and how entrepreneurial approaches can address social challenges in sustainable ways. One stream of research examines inclusive financial services for underserved communities, investigating how access to financial tools influences economic development and resilience. Another focus is on socially and environmentally oriented entrepreneurship and sustainable private enterprises. This work investigates sustainable business model innovation and how entrepreneurial mindsets can be cultivated and address complex social challenges. Dr. Watkins employs both in-depth field studies and quantitative economic and statistical analysis to understand the impact of financial inclusion and private social enterprises on sustainable development. He currently serves as Professor of Economics and Executive Director of the Martindale Center for the Study of Private Enterprise in the College of Business at Lehigh University and was the founding Executive Director of Lehigh's Baker Institute for Entrepreneurship, Creativity and Innovation. He holds a PhD and Master in Public Policy from Harvard University and a BS in Optics from the University of Rochester.



## Brent Goldfarb

Dean's Professor of Entrepreneurship  
Academic Director, Dingman Center  
University of Maryland; [brentg@umd.edu](mailto:brentg@umd.edu)



Brent Goldfarb received a Ph.D. in economics from Stanford University and a bachelor's degree in economics and computer science from Tel Aviv University. Goldfarb's recent projects include a book on bubbles and crashes in new technology industries, with a focus on how narrative impacts entrepreneurial investment and beliefs, a study of how team composition affects entrepreneurial outcomes, and the documentation of gender and racial disparities in student entrepreneurship. Goldfarb also works at the intersection of empirical methods and the Philosophy of Science to develop solutions to the reliability crisis in science.

# Mental Health Awareness Month



Did you know that nearly **1 in 5 American adults** will have a **diagnosable mental health condition** in any given year?

That equates to **68.7 million people**.

**Feeling anxious? Panicked?**

**Try the 3-3-3 rule.**

See: What are 3 objects near you?

Hear: What are 3 sounds you hear?

Feel: How do 3 of your body parts feel?

Click to learn more about grounding.



**YOU'RE  
NOT  
ALONE**

National Alliance on Mental Illness

Substance Abuse and Mental Health Services Administration

Mental Health America

American Hospital Association

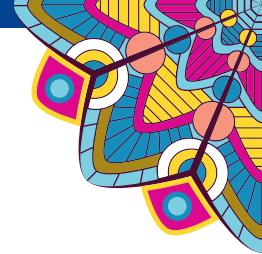
National Institute of Mental Health



*Read  
all  
About it*

Thank you to our fantastic artist, [Chamisa Kellogg](#)!





# Earth Outreach

## Maryland & Kansas



Throughout April, NSF ERC EARTH led several community and student outreach efforts to promote sustainable cooling solutions. A highlight was our participation in #MarylandDay, where the Center for Environmental Energy Engineering welcomed visitors to explore how air-conditioning works and discover innovations like roving robots that deliver personalized cooling. NSF ERC EARTH hosted an exhibit where researchers demonstrated elastocaloric cooling — a technology where nickel-titanium tubes release and absorb heat through compression and relaxation, offering potential for emissions-free cooling. A heartfelt thank you to our graduate students for enthusiastically sharing their knowledge and inspiring the next generation of engineers!



NSF ERC EARTH hosted an Earth Day table to engage with undergraduate and graduate students. The EARTH team connected with attendees to raise awareness about the center's mission and research opportunities. Staff distributed flyers, EARTH-themed swag, and shared information about how students can get involved as researchers. The event fostered meaningful connections and expanded the center's network among students eager to contribute to EARTH's mission!



ERC - EARTH



NSF ERC EARTH



@NSF-ERC-EARTH.BSKY.SOCIAL



NSF.ERC.EARTH



@NSFERCEARTH



# Pennsylvania College of Technology



## Center Director Mark Shiflett and Education Director Casey Williams took a trip to Penn Tech!



"I left the visit energized by how seamlessly our objectives aligned with Pennsylvania College of Technology's leadership and faculty. In a single day, we gained executive support for a new technician-to-engineer pathway, mapped out summer immersion workshops in their state-of-the-art HVAC labs, and set a joint grant-writing schedule to pursue federal and state funding. Curriculum leaders committed to embedding an EARTH elective in the two-plus-two degree sequence by next fall—an essential step toward graduating industry-ready engineers within two years—while workforce-development staff and I outlined a mentor-incentive pilot to strengthen the talent pipeline. With program accreditation happening soon, access to advanced sensor technology for shared testbeds, and the hopes of drafting a MOU, the visit not only cemented a strategic partnership but also set a clear 24-month roadmap for internships, grants, and CTE outreach that will accelerate HVACR workforce development regionally and beyond." -Dr. Casey Williams



ERC - EARTH



NSF ERC EARTH



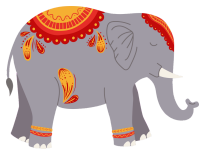
@NSF-ERC-EARTH.BSKY.SOCIAL



NSF.ERC.EARTH



@NSFERCEARTH



# Member Accomplishments



Congratulations to **Professor Dowling** who received the James A. Burns, C.S.C., Award for his exceptional dedication to mentoring graduate students!

Congratulations to **Professor Colón** on becoming a tenured professor!



Congratulations to **Professor Wintoki** on becoming the Dean of the School of Business at KU!



## NRF Scholarship

The National Refrigeration Foundation (NRF) is offering a scholarship to incoming juniors and seniors at 4-year universities and colleges. Interested students must have completed 45 semester credit hours or 90 quarter credits, hold a minimum 3.0 GPA on a 4.0 scale (3.75 on a 5.0 scale), and be working towards an engineering degree. **The deadline to apply is March 31!**

## Upcoming Events

**SAVE THE DATE** for the  
EARTH Webinar Series featuring  
**Jim Seely from Authentix**  
June 17, 2-3 pm CT  
*More details coming soon.*



ERC - EARTH



NSF ERC EARTH



@NSF-ERC-EARTH.BSKY.SOCIAL



NSF.ERC.EARTH



@NSFERCEARTH





# Upcoming Events



The **7th IIR Conference on Thermophysical Properties and Transfer Processes of Refrigerants** will be held **June 15-18, 2025, at University of Maryland**. This international conference aims to outline the future perspectives and challenges of the field as we move toward lower-GWP solutions that minimize the impact of refrigerants on the global environment. **Our Director, Mark Shiflett, is one of the plenary speakers! Online registration closes on June 6.**

**ERC ATP-BIO is hosting a webinar on May 20<sup>th</sup>** titled “The decedent model: A new paradigm for accelerate need lifesaving biomedical innovation and de-risking high stakes clinical trials” presented by Dr. Robert Montgomery (NYU Langone Health).

7<sup>th</sup> IIR Conference on Thermophysical Properties  
and Transfer Processes of Refrigerants

**TPTPR 2025**  
College Park, Maryland USA  
**JUNE 15-18**



CENTER FOR  
ENVIRONMENTAL  
ENERGY ENGINEERING

[ceee.umd/tptpr2025](http://ceee.umd/tptpr2025)

NSF ERC for ADVANCED TECHNOLOGIES FOR THE PRESERVATION OF BIOLOGICAL SYSTEMS



## NSF ATP-Bio PUBLIC WEBINAR SERIES

presents:

**Robert Montgomery**

MD, DPhil, FACS

H. Leon Pachter Chair and Professor of Surgery  
Director, NYU Langone Transplant Institute



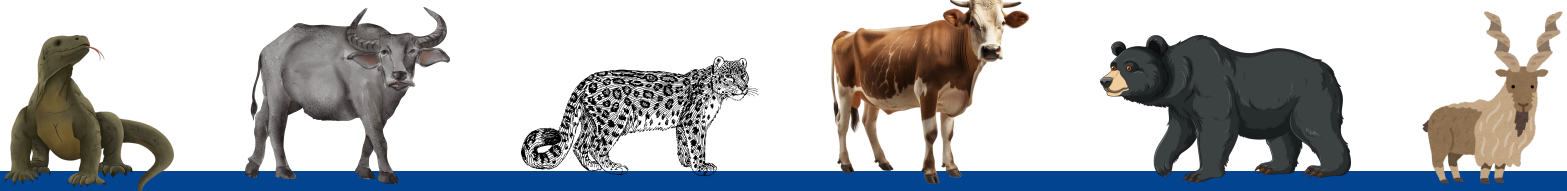
**THE DECEDENT MODEL: A NEW  
PARADIGM FOR ACCELERATE NEED  
LIFESAVING BIOMEDICAL  
INNOVATION AND DE-RISKING  
HIGH STAKES CLINICAL TRIALS**

**Tuesday**  
**May 20 2025**  
2:45-4:00pm CT  
3:45-5:00pm ET

[ZOOM LINK](#)

Dr. Robert A. Montgomery is Chair of Surgery and Director of the Transplant Institute at NYU Langone Health. A pioneer in transplantation, he developed laparoscopic live kidney donation, the Domino Paired Donation protocol, and xenotransplantation. A National Academy of Medicine member, he has published over 325 articles and received numerous honors, including the 2022 Liberty Science Center Genius Award, Newsweek's America's Greatest Disruptors, and Ukraine's Order of Merit for humanitarian efforts.

Visit us: [atp-bio.org](http://atp-bio.org)



Please use the following statement in your publication acknowledgements if your research was funded by EARTH.

“This research is based upon work supported by the National Science Foundation under award number **ERC-2330175** for the Engineering Research Center EARTH.”



ERC - EARTH



NSF ERC EARTH



@NSF-ERC-EARTH.BSKY.SOCIAL



NSF.ERC.EARTH



@NSFERCEARTH