University at Buffalo
Research and Education in eNergy, Environment and Water (RENEW)

Currents

News, events and more from the RENEW Institute, where faculty collaborate across disciplines to solve the world's most pressing problems

SPRING 2025

Message from the Director

Uncertainty is challenging. Whether it's the fate of a submitted proposal or the timeline of a lab's retrofitting, academic scientists routinely adapt to it. However, rapidly shifting federal priorities for sponsored projects are significantly increasing our collective "uncertainty burden," which is stressful. Though the short term is fraught with unknown variables, I'd like to share some thoughts on how we might proceed.

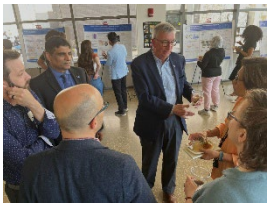
We are equipped to contend with uncertainty. Steeped as we are in the scientific method, we know to address the state of “not knowing” methodically: formulating, testing, and revising hypotheses. Amidst the tumult, let’s focus on the training that make us tenacious and resilient in our pursuit of scientific knowledge. To that end, RENEW is equipped with instrumentation, tools, and support mechanisms to advance our thinking and spark new findings. (See the Shared Instrumentation Spotlight below.)

We can plan and prepare for the future. Let’s continue to ready ourselves for future proposals. Whether organizing planning sessions, breakfast meetups, or other networking, brainstorming, or information sharing events, RENEW is here to support our community of researchers. Our Catalyzing Conversations lecture series continues to enrich the campus community and prompt interdisciplinary dialogue. Through the collaborative effort of RENEW and CSEE researcher Yinyin Ye and EVS’s Marisa Manheim, we hosted two outstanding guest speakers this spring. If you would like to nominate a speaker, please use the weblink here!

Together, let’s maintain focus on what we do best: tackling the most persistent energy, environment and water challenges that the world faces today.

Diana S. Aga, Ph.D.
SUNY Distinguished Professor
Henry M. Woodburn Professor of Chemistry
Director of RENEW Institute

News and Updates



RENEW expands popular End of Year Poster Session

On April 24, students of RENEW's Core Faculty and Faculty Affiliates showcased their research at the RENEW Annual End of Year Poster Session. Over 100 attendees engaged with 34 student presenters from across the disciplines.
>>> Read about the event in UBNow

NSF elevates UB and RENEW-led research

Last month, the findings of former NSF Ascend Postdoctoral Research Fellow Karla Sanchez Lievanos were featured in NSF "Highlights." Under the supervision of Diana Aga and Tim Cook from the Department of Chemistry, Sanchez Lievanos established the promise of molecular nanocages to remove up to 90% of PFAS from groundwater, which will inform development of environmentally-responsible solutions for PFAS removal from water.
>>> Read these findings

Sophie Nowicki receives $5M grant from the Heising Simons Foundation

Sophie Nowicki and her international team have been awarded $5M to fund a 4-year project to improve the sea level contributions from Greenland and Antarctic ice sheet in the coming centuries. Nowicki's Ice Sheet Model Intercomparison Project for CMIP7 (ISMIP7), builds on the previous success of ISMIP6, which delivered key projections for the IPCC Sixth Assessment Report. >>> See how Nowicki's research informs this NASA Sea Level Projection Tool and review her data sets on Ghub.

Unexpected findings in Kristin Poinar's "state-of-the-climate" summary for NOAA's Arctic Report Card

After a decades-long period of fast ice flow, mass loss of the Greenland Ice Sheet slowed considerably in 2024. Poinar's findings demonstrate that the lost ice sheet mass was 50−80% less than the 2002−2023 annual average. This constitutes encouraging news for the Greenland Ice Sheet as well as the planet.
>>> Read Poinar's Arctic Report Card

Photo Credit: Meredith Forrest Kulwicki

RENEW research featured in NIH Newsletter

The May issue of the National Institute of Environmental Health Science's newsletter Environmental Factor features a new PFAS detection method developed by Diana Aga, Luis Colón, and NIH graduate student fellow Karla Rios-Bonilla.
>>> Read Rios-Bonilla's related research about PFAS mixture toxicity assessment

Sophie Nowicki to lead NSF Research Experiences for Undergraduates (REU) at UB this summer

A prestigious NSF REU has been awarded to Sophie Nowicki to support the participation of 10 undergraduates from across the U.S. to investigate extreme weather events in her Center for Geological and Climate Hazards. SUNY has augmented the award with additional support to further expand the program's impact.
>>> Learn about Nowicki's REU in UBNow

Spring meetup: Climate Change Brainstorm Blitz

To promote rapid exchange of ideas and spark new collaborations among climate researchers, Kristin Poinar designed and convened an innovative breakfast meetup for interdisciplinary scientists; a follow up event is tentatively planned for the fall. Other recent thematic meetups requested by faculty have included a “Water breakfast” for faculty conducting Great Lakes research, and a “Chemistry-centric PFAS breakfast.” RENEW Core Faculty and Faculty Affiliates are encouraged to submit their ideas for breakfast meetups to Lisa Vahapoglu.

Thomas Thundat receives NSF I-Corps Funding

Thomas Thundat received a $50K grant for his project titled "Translation Potential of a Handheld Standoff Photothermal Spectroscopy System for Real-time Indication of Viral Epidemics." The project aims to develop a non-invasive, highly portable diagnostic tool for accurate, real-time detection of viruses, ultimately minimizing the spread of infectious diseases and improving patient outcomes.

Krishna Rajan receives UB sustainability award

At UB's 2025 Climate Action Update, RENEW Steering Committee member Krishna Rajan was presented the 2025 Champions for Change Sustainability Leadership, Innovation and Collaborative Engagement (SLICE) Faculty award for his efforts to promote sustainability.
>>>Learn more

Shared Instrumentation Spotlight

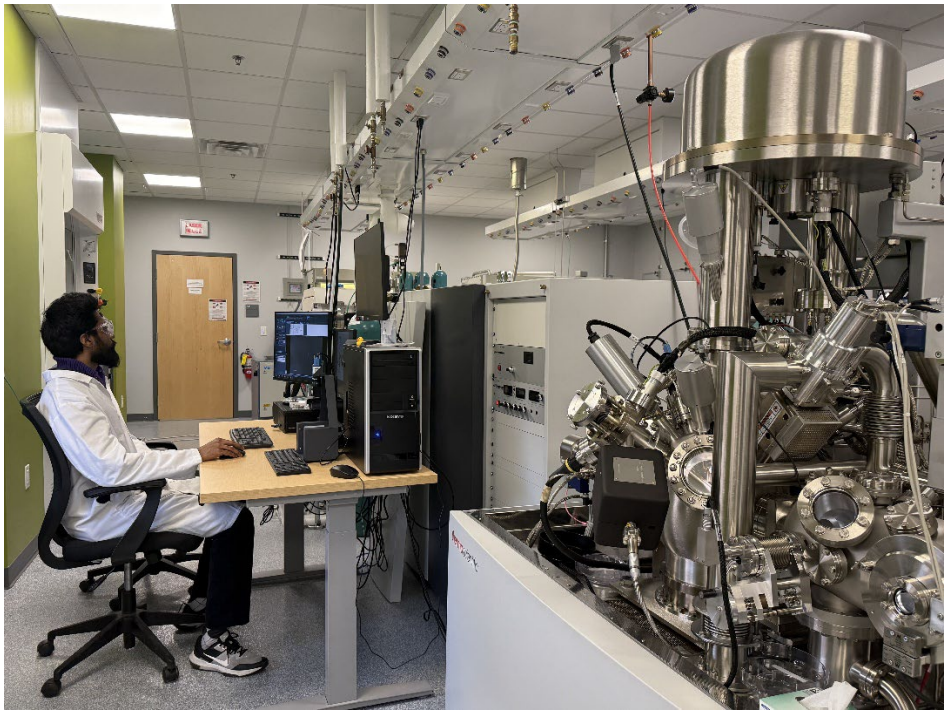


Photo Credit: Udani Wijethunga (XPS pictured with Dulan Edirisinghe)

Instrument Spotlight - Thermo Fisher ESCALab QXi3

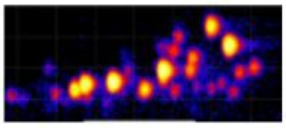
Would your research benefit from the ability to characterize the chemical composition and structure of a material's surface? Are you sending your samples to laboratories outside UB to obtain information about surface chemistry and reactivity of new materials? If so, RENEW is excited to inform you that we've recently acquired a state-of-the-art Thermo Fisher ESCALab QXi3 X-ray Photoelectron Spectrometer microprobe: a powerful, multi-functional system for surface analysis of materials, with transdisciplinary applications in the sciences and engineering.

The ESCALab can perform measurements for x-ray photoelectron spectroscopy (XPS), ultraviolet photoelectron spectroscopy (UPS), inverse photoelectron spectroscopy (IPES), Auger emission spectroscopy (AES), ion scattering spectroscopy (ISS), and reflection electron energy loss spectroscopy (REELS). The system is equipped with multiple x-ray anodes and is designed to provide high-resolution surface chemical information and depth-profiling experiments.

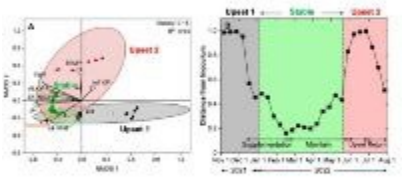
The ESCALab was purchased through an Enabling Equipment Grant awarded by the Vice President of Research and Economic Development to address critical instrumentation needs at UB. RENEW will convene an informational webinar on the instrument, its capabilities, and operational principles on Tuesday, May 27 (details to follow). All are welcome to attend. Contact RENEW Laboratories Director Judith Cristobal with questions and to discuss this and other training opportunities.

>>> Explore RENEW's Shared Instrumentation

Recent Publications

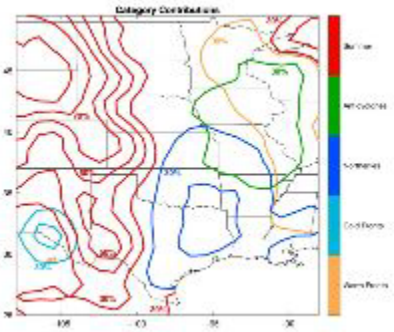


Diana Aga: PFAS biodegradation by *Labrys portucalensis* F11: Evidence of chain shortening and identification of metabolites of PFOS, 6:2 FTS, and 5:3 FTCA, and Evaluation of dried blood spots approach to measure blood lead concentrations in low-level exposure scenarios,

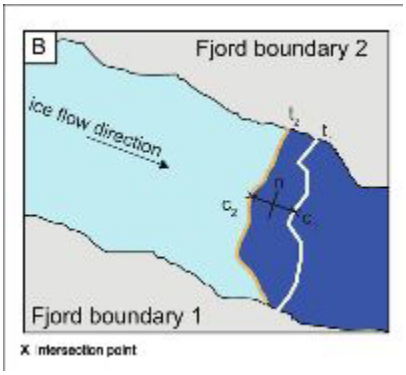


Ian Bradley: Community structure and function during periods of high performance and system upset in a full-scale mixed microalgal wastewater resource recovery facility

Andrew Crooks: Mapping the Invisible: Decoding Perceived Urban Smells Through Geosocial Media in New York City and Cities and disasters: What can urban analytics do?

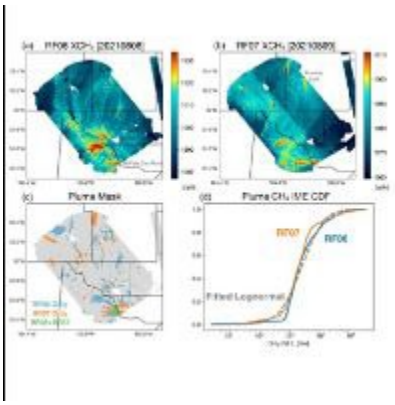


Stuart Evans Dust-producing weather patterns of the North American Great Plains

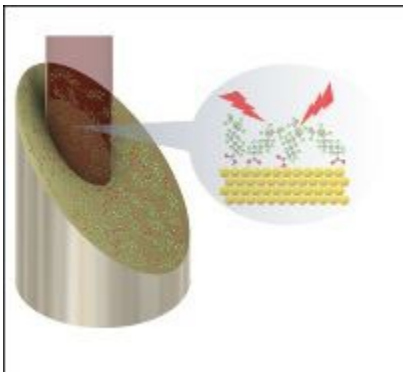


Sophie Nowicki: ISMIP6-based Antarctic projections to 2100: simulations with the

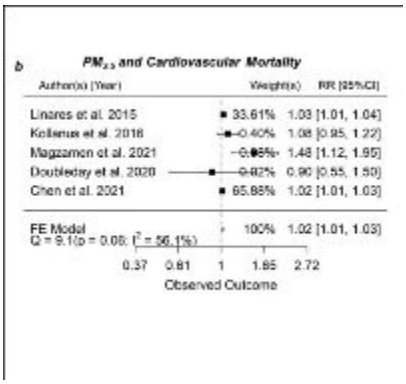
BISICLES ice sheet model and A Frontal Ablation Dataset for 49 Tidewater Glaciers in Greenland.



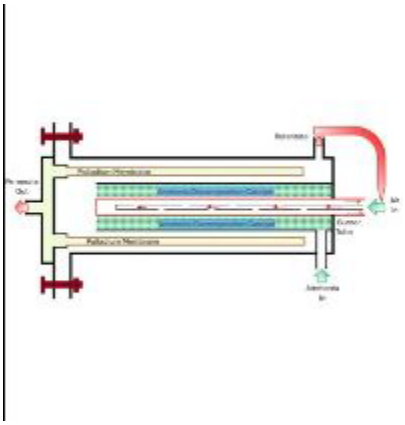
Kang Sun: Methane retrieval from MethaneAIR using the CO2 proxy approach: a demonstration for the upcoming MethaneSAT mission



Thomas Thundat: Real-time detection of trace analytes using molecular-antenna-enhanced photothermal spectroscopy



Meng Wang: Associations of wildfire-derived particulate matter with hospitalization, emergency department visits and mortality: A systematic review and meta-analysis.



Miao Yu: High purity hydrogen production from ammonia using a self-sustained catalytic membrane reactor and Highly efficient hydrogen production using a self-sustained ammonia decomposition system

Happy Spring!

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As a valued member of the University at Buffalo community, you will receive periodic emails containing important information that support your success at UB.

Our mailing address is:
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