



UCF Energy Symposium Spotlights Groundbreaking Power Generation and Sustainability Innovations

By Mark Gauthier | May 15, 2024 - UCF's commitment to pioneering research in energy and sustainability was prominently highlighted at the recent Energy Symposium organized by the Office of Research. The day-long event provided insights into pivotal research focused on energy and sustainability — one of the five focus areas of the UCF strategic plan. In addition to highlighting current UCF researchers' successes, the symposium laid the groundwork for future sustained scientific collaboration through the planned formation of a Research Energy Council.

Once established, the Research Energy Council will have a three-fold objective:

1. Foster key figure collaboration.
2. Yield a plan to facilitate increased funding for energy and sustainability research, specifically for large, interdisciplinary, complex proposals with a significant university-wide impact.
3. Highlight UCF researchers' strengths and accomplishments in the energy and sustainability fields.

Pioneering research endeavors were highlighted through four keynote speaker presentations:

- Dr. James Fenton, UCF Professor of Materials Science & Engineering and Director of Florida Solar Energy Center (FSEC) discussed research initiatives aimed at achieving 100% renewable, net-zero emissions energy production. His presentation covered a wide range of areas from residential solar energy to smart-charging EVs, sustainable aviation fuels, and high-speed electric trains.



- Dr. Jayanta Kapat, UCF Pegasus Professor & Trustee Chair and Director for the Center for Advanced Turbomachinery and Energy Research (CATER) emphasized holistic, affordable, and equitable global decarbonization strategies, with a focus on commercial aviation.
- UCF Pegasus Professor and Director of the RISES (Resilient, Intelligent and Sustainable Energy Systems) center Zihua Qu highlighted his team's work regarding sustainable, zero-carbon, and resilient microgrid technologies. He further shared the group's investigative efforts to enhance power grid resilience against cyber threats.
- Dr. Xiaofeng Feng, UCF Associate Professor of Physics and Renewable Energy and Chemical Transformation (REACT) Cluster faculty member, shared key aspects of his team's research on renewable energy and chemical transformations, with a detailed description of the team's work in the area of electrochemical energy conversion and how the process transforms renewable electricity (wind, solar, hydro) into chemical energy (useable liquid fuels) while reducing CO₂ emissions.

The day included several additional talks focused on the advancement of clean energy and sustainability. These shorter lectures covered a wide range of research topics from investigating hydrogen clean energy power-generation using optical and novel laser diagnostic research techniques to the development of a reactive particle-based thermochemical energy storage system for concentrating solar-thermal power (TCES-CPS). Other technical areas the presenters addressed included developing more robust and durable solar energy solutions; creating smarter and scalable residential HVAC and water heating systems; and unlocking safer, lighter, and more powerful battery technologies for use in EVs, UAVs, and spacecraft. Presenters also discussed important sustainable energy, environmental, and societal challenges as they pertained to their research, including energy infrastructure natural disaster resilience and the analysis of energy and environmental policies.



By establishing a platform for researchers from a variety of disciplines to learn from each other and exchange ideas — including multiple group discussion sessions covering topics such as talent recruitment, collaboration between centers, and opportunities for national and global impact — the event laid a solid foundation for the future Research Energy Council's work in support of UCF's continued prioritization of energy and sustainability in its strategic plan.