

UT Energy Bulletin | August 2020

## Energy@UT News



#### New Room-Temperature Liquid-Metal Battery Could Power the Future

Researchers in the <u>Cockrell School of</u> <u>Engineering</u> have built a new type of battery—called a "room-temperature allliquid-metal battery"—that combines the best of both liquid and solid-state batteries, and saves energy. This innovation promises more power than today's lithium-ion batteries, which are the backbone of most personal electronics. Read more about this research <u>here.</u>



#### UT Joins Multi-University Nuclear Reactor Partnership to Advance Clean Energy

UT Austin and four other universities are partnering with Natura Resources to design a nuclear research reactor to advance research in clean energy. At the facility, the consortium will develop solutions to some of the world's most critical energy needs, including cleaner and less expensive energy; pure and



abundant water; and medical isotopes for cancer treatments. UT Austin will lead the design of the reactor bay experimental research facilities and collaborate on the design and safety analysis of the entire system. Read more about the project here.

# Will Water Issues Constrain Oil and Gas Production in the U.S.?

The U.S. became the largest global oil and natural gas producer in 2018. To address concerns about the adverse impacts of such progress on water use, researchers at UT's <u>Bureau of</u> <u>Economic Geology</u>, led by <u>Bridget</u> <u>Scanlon</u>, analyzed historical data across key producing regions in order to project the volumes of future hydraulic fracturing water and produced water. The results show that demand for water may constrain future energy production. Read the detailed results of this study <u>here.</u>



#### A Holistic Approach to Reducing Energy Consumption in Tall Buildings

In an award-winning article for the Journal of Architectural Engineering, Juliana Felkner of the <u>School of</u> <u>Architecture</u> explores how structural efficiency, energetic performance and aesthetic design can complement each other to reduce energy use in tall buildings—the source of one-third of worldwide energy demand and man-made emissions. Read the full analysis <u>here.</u>

#### New Cobalt-Free Lithium-Ion Battery Reduces Costs & Maintains Performance

For decades, researchers have looked for ways to eliminate cobalt from the highenergy batteries that power electronic



devices, due to the high cost and harmful labor impacts of mining. Now, a team at the <u>Cockrell School of Engineering</u> has cracked the code for eliminating cobalt in a high-energy lithium-ion battery. The researchers reported a new class of cathodes—the electrode in a battery where all the cobalt typically resides—anchored by high nickel content, which increases the battery's overall storage capacity. Read the findings in <u>Advanced Materials</u>.



#### Lea Hildebrandt Ruiz Receives AIChE's Environmental Division Early Career Award

Lea Hildebrandt Ruiz of the <u>McKetta</u> <u>Department of Chemical</u> <u>Engineering</u> has been named this year's recipient of the American's Institute of Chemical Engineering's 2020 <u>Environmental Division Early Career</u> <u>Award</u>. Dr. Hildebrandt Ruiz's <u>research</u>—primarily conducted through UT's <u>Center for Energy and</u> <u>Environmental Resources</u>—focuses on atmospheric chemistry and the effects of pollutants on human exposure in indoor and outdoor environments. Read more about her research and career <u>here.</u>



#### Cockrell Professors Receive International Teaching & Research Accolades

Two <u>Hildebrand Department</u> professors will be honored by <u>The Society of</u> <u>Petroleum Engineers</u> for significant contributions to the field of petroleum engineering. <u>Mukul Sharma</u> is receiving Honorary Membership, the SPE's highest honor for an individual, in recognition of his extensive research in hydraulic fracturing, and <u>Kamy Sepehrnoori</u> will receive the Distinguished Achievement Award for Petroleum Engineering Faculty for his globally-recognized excellence in



teaching and research. Read more about their careers <u>here.</u>

#### Improving Efficiency & Achieving True Co-Design in Machine Learning Models

Diana Marculescu, chair of UT's Electrical and Computer Engineering Department, was featured on *This Week in Machine Learning* to discuss her work on hardware-aware machine learning. The piece specifically explores themes from her keynote, "Putting the 'Machine' Back in Machine Learning: The Case for Hardware-ML Model Co-design", from the Efficient Deep Learning in Computer Vision workshop at the CVPR conference earlier this year. Learn more <u>here.</u>



#### Catch Up on Energy@UT Summer Energy Talks

The Energy Institute's *Summer Energy Talks* featured four 1-on-1 conversations with leaders to discuss how energy affects our lives and economy, and how COVID-19 and events of the last few months have affected the way we think about *Fueling a Sustainable Energy Transition*. View our guest speakers' talks on our <u>YouTube</u> <u>channel</u> or <u>website</u>.

### More news from around campus

- <u>Bureau of Economic Geology:</u> Katherine Romanak and Susan Hovorka host <u>IEAGHG webinar</u>, "Regulation, Industry, & Research: Translating Monitoring Research to Meet Commercial Needs"
- <u>Cockrell School of Engineering</u>: Watch Chandra Bhat's <u>webinar</u> on the safety and regulatory preferences that come with autonomous vehicle integration
- INFEWS Scholar Program: Tackling mathematical models for sustainable communities and mitigating agricultural pollutants in the northern Gulf of Mexico

- Catch up on recent <u>TexTalks</u>, hosted by <u>Texas Engineering Executive</u>
  <u>Education</u>
- <u>NextGenPV</u> hosts Michael Irwin of Hunt Perovskite Technologies for a <u>webinar</u> on "An Industrial Perspective on Metal Halide Perovskite Research"
- <u>Cockrell School of Engineering</u>: Yu Research Group shares summer research news featured in <u>Chemistry World</u> and <u>Nature Communications</u>
- <u>Energy Institute:</u> Varun Rai and Anna Broughel, Energy Institute Fellow, featured in U.S. Association for Energy Economics <u>webinar</u> on artificial intelligence in energy

## **Events**

<b>UT ENERGY SYMPOSIUM</b> FALL 2020 HIGHLIGHTS		
<b>SEPTEMBER 15, 2020</b>	OCTOBER 6, 2020	OCTOBER 27, 2020
<b>ELLEN STECHEL</b> Global Institute of Sustainability & Innovation, Arizona State University	MATTHIAS RAAB & MAX WATSON CO2CRC Ltd., Australia	DEMOND DRUMMER New Consensus
NOVEMBER 24, 2020	DECEMBER 1, 2020	EVERY TUESDAY FROM 12:30 TO 1:45 PM
<b>NOAH KAUFMAN</b> SIPA Center on Global Energy Policy, Columbia University	<b>THE HONORABLE</b> <b>LIZZIE FLETCHER</b> Chair, U.S. House Subcommittee on Energy	HOSTED VIA LIVESTREAM FREE & OPEN TO THE PUBLIC For instructions for accessing the webinar and event updates,

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