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Our second issue covers some recent advances made and awards won by some of our team here at CIEE, as well as from energy researchers across campus. Impacts on global smart building standards, a fleet of Manhattan robotaxis, microsynchrophasors and more are in this edition of the CIEE Sentinel.

May 3
ERG Public Lecture
May 17
Understanding Redwood Giants: Using Science to Protect the Tallest Forests

The UN's Climate Change Body Releases its First Annual Report

CIEE Team Presents at the ARPA-E Innovation Summit
CIEE affiliates were featured at the ARPA-E Energy Innovation Summit at Washington DC last month, presenting their work on Micro-Synchrophasors in the panel on “Emerging Technologies for Stable and Secure Grid Management.”

Every year, the ARPA-E Energy Innovation summit brings together experts from different technical disciplines and professional communities to think about America’s energy challenges in new and innovative ways. There were over 2,000 attendees from 16 countries, as well as over one hundred expert speakers and keynote addresses. The work with micro-synchrophasors, one of CIEE’s major contributions to renewable energy research, is headed on campus by Dr. Sascha von Meier alongside Dr. Laura Mehrmanesh, Dr. Elizabeth Ratnam, and Dr. Aminy Ostfeld (who recently has moved on from CIEE to work at Amber Kinetics as a Senior Validation Engineer).

Sean Murphy and Jerry Schuman, co-CEOs of PingThings, represented our joint project “Micro-Synchrophasors for Distribution Systems” with a booth and presentation at the Innovation Summit. This large research project led by CIEE focuses on hardware, software and data analysis involving the micro-phasor measurement unit, or uPMU. The uPMU is able to make ultra-high precision time-synchronized measurements in electric power distribution systems, including a.c. voltage and current magnitudes and phase angles. These synchrophasor measurements provide information about power flows and stability of the grid. The project has also created a powerful and extremely fast new platform for handling rich measurement data, called the Berkeley Tree Database (BTrDB), to support real-time and offline analysis at different time scales. Now in its Plus-Up continuation phase, the project is developing and commercializing practical applications for using uPMU data for power distribution planning and operations, including event detection, various diagnostic techniques, and the improved management of variable solar resources.

PingThings is CIEE’s commercialization partner in bringing BTrDB software to the electric power industry. They were joined by Mario Barbaresso, CEO of Power Survey, which recently acquired Power Standards Lab, the original project partner that built the uPMU hardware.
Dr. Sascha von Meier wins Distributions Team MVP at NAPSI Awards 2017

CIEE's own Dr. Sascha von Meier took home the NASPI 2017 Distribution Task Team Most Valuable Player Award at the recent NAPSI Work Group meeting in Albuquerque, New Mexico.

The North American Synchrophasor Initiative (NASPI) is an international community of electric industry members, researchers, and vendors working together to advance the understanding and adoption of synchrophasor technology to enhance power system reliability and efficiency. This is the fourth year that NASPI has issued awards to recognize significant accomplishments and contributions of its members in 2017.

From their press release: "Sascha accepted the challenge of standing up and leading NASPI's Distribution Task Team in 2016. Since then, the DisTT has attracted many new members, produced an excellent technical paper, and has more foundational technical work under way on emerging distribution opportunities and analytical methods."

An award well deserved—congratulations to Dr. von Meier on the win!

The recent NASPI DisTT White Paper is available here.
Climate Video Series: A Brief History of Global Change

As a gradual and global phenomenon, climate change cannot be detected with the bare eye. However, time-frame comparisons of historical maps, photos, fossils, and the like can give us a sense of how global warming changes our world. Charles Marshall studies just this. His work as a paleobiologist and current Berkeley Natural History Museum chair provides him the opportunity to examine how paleontology informs the study of life and its surrounding systems.

In this Cal Future Forum talk, Marshall examines not only the evidence of global warming's origins, but also the opportunities available to overcome its effects. His exploration provides hope that Berkeley’s rich community of researchers, students, private industry leaders, and government leaders can build a strong basis to tackle the climate issues of the future. You can watch his video below!
Lawrence Berkeley National Labs: Automated Vehicles and the Environment

“What would it look like if all Yellow Cabs in Manhattan were replaced with self-driving electric taxis? How much battery range would they need, and where would you put charging stations? How much would it cost to ride in a robotaxi, and what would the environmental impact be?”

These are some of the questions being posed by ERG student Gordon Bauer and other researchers at Lawrence Berkeley National Labs.

In April, researchers at LBNL explored the environmental impacts associated with the potential rise of self-driving electric vehicles. Their research focused on taxi fleets in the Manhattan area, using data from over 10 million citywide taxi rides. Their analysis found that shared automated electric vehicles can not only reduce overall operational taxi costs but can also reduce greenhouse gas emissions and energy consumption overall.

The research study was conducted by graduate student Gordon Bauer of UC Berkeley’s Energy and Resources Group, in conjunction with Jeffery Greenblatt and Brian Gerke of Berkeley Lab. The final article titled, “Cost, Energy, and Environmental Impact of Automated Electric Taxi Fleets in Manhattan,” was published recently in the journal *Environmental Science & Technology*. For more information, please visit their website, or watch their YouTube video on the topic below.
UC Berkeley Alum Awarded Guggenheim Foundation Fellowship

Congratulations to UC Berkeley’s Energy and Resources Group alumnus Jesse Ribot, who received the 2018 John Simon Guggenheim Memorial Foundation Fellowship for Geography and Environmental Studies.

The Guggenheim Fellowship is a prestigious multinational grant program that will assist Ribot and the other recipients in pursue research in their areas of expertise. Ribot’s work centers on environmental justice, focusing on political representation and equity in struggles over the benefits from natural resource use and commerce in Africa.

For more details on Jesse's research, you can visit his page on the Guggenheim Memorial Foundation's website.

ASHRAE adopts Brick into Building Automation and Control Standards

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers'
(ASHRAE) BACnet committee have recently announced that they will be incorporating the Brick data modeling schema, co-developed by UC Berkeley's own Gabe Fierro, into their protocol standards for building automation and control.

Brick is an open-source, BSD-licensed schema for metadata in buildings. Brick defines (1) a class hierarchy describing the families of sensors, equipment, subsystems and other building assets, and (2) a minimal, well-defined set of relationships for describing the associations and connections between those entities. These concepts are captured in an extensible RDF ontology. Applications for the built environment (such as analytics, alarms, controllers and schedulers) use the standard SPARQL query language to access the Brick representation of a building and determine the set of resources and relationships that they require to operate. This declarative approach improves portability across buildings.

The Brick schema, as a result of this collaboration, will be part of the industry standard for building automation and control not only nationally, but globally as well. We'd like to congratulate Gabe and the rest of the Brick team for achieving such a significant milestone, as well as their contributions in the development of a smarter framework for smart buildings.

upcoming EVENTS

Energy Resources Group Public Lecture

This Thursday, May 3rd, the Energy Resources Group will be hosting a public lecture by Douglas Brinkley, a professor of American History at Rice University in Houston, honoring the career of Professor Carolyn Merchant, of UC Berkeley's Department of Environmental Science, Policy, and Management who is retiring after almost 40 years of teaching and research on the Berkeley campus.

Merchant's landmark book, The Death of Nature: Women, Ecology, and the Scientific Revolution, has shaped the fields of women’s studies, environmental history, and the history of science ever since its publication in 1980. Today she stands as one of the most influential scholars in environmental studies, ecofeminism, and environmental philosophy and has been especially recognized for over a dozen books—with two new ones just out—and over a hundred articles. Over her career Carolyn has taught hundreds of undergraduate students and served on the graduate committees of students from numerous departments at Berkeley and other campuses. Professor and environmental writer Douglas Brinkley will dedicate this lecture to Carolyn Merchant and his forthcoming book “Rachel Carson and Silent Spring.”
The event will be held at 159 Mulford Hall, from 7-9 PM, and is free to attend. For more information, visit ERG's website.

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**Understanding Redwoods Lecture**

Redwoods are among the largest and tallest trees worldwide, allowing them tremendous potential to sequester carbon and combat climate change. But how exactly can we help them thrive in future environments? Join Emily Burns, the Director of Science for the Save the Redwoods League, on May 17th, for a hands-on lecture in the Redwood Grove, at Berkeley’s Botanical garden. She will discuss strategies on applying climate change, genomic, and restoration research to sustain redwood forests. The event will be held from 10 to 11:30 am, and you can register at the Berkeley Events website.

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