

IQ - ISEE Quarterly

An update from the Institute for Sustainability, Energy, and Environment

What's new at iSEE ...

Illinois Professors Take New Leadership Roles at Institute

During the Spring 2017 semester, the Institute for Sustainability, Energy, and Environment (iSEE) was pleased to announce that Ximing Cai, Lovell Endowed Professor of Civil and Environmental Engineering at Illinois, was hired as the new Associate Director for Campus Sustainability.

In this position, Cai will lead the Institute's efforts related to the Illinois Climate Action Plan (iCAP), campus' roadmap to becoming carbon neutral as soon as possible — and no later than 2050.

"We're confident that Ximing's vision for campus sustainability will bring iSEE's mission arms closer together, completing the circle between research, campus sustainability, and education and outreach," iSEE Director Evan H. DeLucia said. "The efforts he leads will provide excellent research projects and learning experiences for students — and also much-needed data to drive sustainable decision-making on campus and beyond."

Cai is leading an effort to take inventory of all the sustainability projects and facilities on campus and will seek to tie them to major research funding opportunities.

Outgoing Associate Director Ben McCall, a Professor of Chemistry at Illinois, has transitioned to a role as Assistant Director for iSEE Special Projects, where he will continue to help lead the Urbana-Champaign campus toward certain campus sustain-



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ability objectives — many of them involving Illinois' continued reduction of carbon emissions.

In addition, iSEE welcomes Gillen D'Arcy Wood, environmental author and Professor of English at Illinois, as an Institute Faculty Affiliate.

Wood, the Langen Professorial Scholar of Environmental Humanities of English, will provide leadership for the new campuswide Certificate in Environmental Writing program co-created by iSEE, the School of Earth, Society and Environment (SESE), and the Department of English.

He will also serve as editor of *Green Century*, a new environmental magazine featuring student works that will be published by iSEE.

[Read more about the new Certificate on Page 3.](#)

What's inside ...

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What's new in research ...

In the Spotlight: Kelley Goncalves

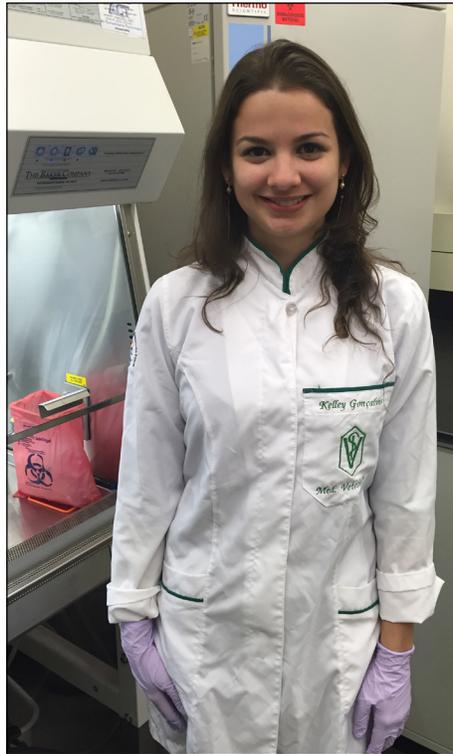
Kelley Goncalves is a Ph.D. student in Molecular and Cellular Biology, so her part in the Smart Water Disinfection project is mostly under the microscope.

The Smart Water project as a whole seeks a more detailed understanding of how viruses become inactivated — noninfectious — after contact with common disinfection treatments, including ultraviolet light exposure and chlorine. A functioning virus enters a human cell, multiplies within the cell, and then spreads to surrounding cells. Inactivated viruses don't make it to the spreading stage, so the host doesn't get sick. Why? Goncalves hopes to find out.

"What we do is we run the disinfection experiment at Newmark Civil Engineering Lab, and then we bring the samples to the microbiology lab for data analysis on damage to the virus's complete set of DNA. We also do protein analysis — asking "What amino acids of the proteins are being damaged? Or, what's mutating in the virus?" she said.

She will see the structural damage water treatments do to the virus — each component that is part of the virus being affected — in an attempt to find out how disinfectants do what they do to water-borne viruses.

Goncalves grew up in Santa Maria, a small city in Brazil's most southern state Rio Grande do Sul. Her father is a well-known scientist and professor at the



Federal University of Santa Maria, and her mother is a biologist and high school and community college instructor. Sustainability has always been part of her home life.

"My mom was always very worried about the planet as a biologist. So we would get water from the rain and use it

in our house," she said. "We would try to make not so much trash, and we would try to recycle things," she said.

After interning at Illinois to work on an ultraviolet treatment of drinking water, she opted to enter the Ph.D. program at the U of I to specifically work on the Smart Water Disinfection project.

"I am very excited about it," she said. "I think I couldn't be in a better project, honestly speaking. Sometimes in vet school, I was feeling kind of lost because it wasn't something that motivated me as much. But being able to work with sustainability and water treatment and everything I was taught as a kid by my mom, I feel very lucky to be able to work on something like this — on something I am really passionate about."

After completing her Ph.D., Goncalves would love to be in a developing country implementing what she learns in the lab. There's great potential for dialogue, she says.

"Most people have to worry about what to eat, let alone if they are using the most effective water disinfection. They don't really care if the water has some byproducts from treatment so long as there's water to drink."

[Read the full profile of Goncalves on the iSEE website.](#)

[More about the Smart Water Disinfection project.](#)

Illinois Researchers Publish Papers on Oil Pollution, Agroforestry

Researchers on the iSEE-funded Oil Pollution Treatment project team have successfully developed a novel material that promises an environmentally friendly solution to aquatic oil spills.

Developed by the Dipanjan Pan Bioengineering Lab at Illinois, the Nano-CarboScavenger (NCS) powder simultaneously diffuses oil floating on the water's surface for natural breakdown and absorbs oil and traps it for easy removal. Pan recently reported results in an article in *Scientific Reports*, one of the *Nature Research* journals.

Most methods for oil cleanup today rely on releasing toxic chemicals into the ecosystem, but the NCS particle leaves fish and other aquatic life — as well as humans — unharmed.

[Read the full news release.](#)

[Check out the Crude Oil Pollution Treatment project webpage.](#)



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In March 2017, the iSEE-funded Agroforestry for Food research team published a paper in the international journal *Agroforestry Systems* encouraging peers in the agroforestry research space to take up live-scale research on multifunctional woody polyculture (MWP): an agricultural system of fruit- and nut-bearing tree species cultivated for profit, ecosystem services, and human health benefits. While the overall benefits of such systems are well documented, not enough detail is known about how MWP achieves them — from plant-to-plant interaction to water demand.

Principal Investigator Sarah Taylor Lovell and her co-authors argue for a network of institution-controlled studies and field trials that could unite "the innovation of growers and the resources of agricultural experiment stations" at land grant universities."

[Read more about the Agroforestry for Food project page on the iSEE website.](#)



What's new in education ...

Certificate in Environmental Writing Program Opens in Fall 2017

In March, iSEE announced a partnership with the School for Earth, Society and Environment (SESE) and the Department of English to offer a new Certificate in Environmental Writing (CEW) for students wanting to engage the latest research in sustainability science — and to build their skills in environmental communication.

The Certificate, which debuts in Fall 2017 and is enrolling students now, is at the cutting edge of interdisciplinary sustainability programs in the nation.

The motto of the CEW is “turning data into narrative” — learning about the latest scientific research on the environment and how to communicate that research effectively to the public.

Students enrolled in the newly developed CEW capstone course (ESE/ENGL



498) will have the opportunity to submit their work for publication in the new iSEE online magazine for student environmental writing, *Green Century*. If successful, those students will work closely with the editors and production staff of *Green Century* on developing the article to a professional, publishable standard.

The CEW will be administered by iSEE Affiliate Professor Gillen D'Arcy Wood, the Langan Professorial Scholar of Environmental Humanities of English. He will serve as Editor of *Green Century*.

[Read more about the program and the three-course path to attaining the Certificate on the iSEE website.](#)

What's new in outreach ...

Mark your Calendars: Upcoming Events Summer, Fall

- **Crops *in silico* Symposium and Workshop: June 26-28 at University of Oxford, UK.** *Cis*, an iSEE seed-funded project, is hosting its second annual gathering (the 2016 event was on the U of I campus) for experts in experimentation, agronomy, physiology, plant development, phenotyping, as well as experts in computational modeling, software development, and data visualization. The event aims to harness the great strides in understanding of plant function from genes to whole plants, to accelerate forward approaches to crop breeding and bioengineering. [Read more on the *Cis* website.](#)

- **iSEE Congress 2017: Sept. 18-20.** “Building Resilience to Climate Change” will feature a keynote lecture from John Holdren, former Director of the White House Office of Science and Technology Policy. Experts from different disciplines will participate in this forum to discuss the near- and medium-term options for building resilience to climate change and policy directions for long-term solutions. [Schedule, speakers, and more details on the iSEE webpage.](#)

- **Sustainability Week: October.** Our annual celebration of the great work the U of I campus is doing to reach carbon neutrality. [Schedule will be posted soon on the iSEE webpage.](#)



Facilities & Services Active Transportation Coordinator Lily Wilcock, left, helps Chancellor Robert J. Jones try out his borrowed bike as he prepares for an April 19 Bike Ride with the Chancellor, one of the many highlights of Earth Week 2017.

What's new with the Student Sustainability Committee (SSC) ...

Funded Innovators Honored

The Student Sustainability Committee celebrated its annual End of Year Banquet and Awards Ceremony on April 19, honoring several past SSC-funded projects for innovation, engagement, and campus impact. Honorees included:



- Krannert Center for the Performing Arts, which saved hundreds of thousands of kilowatt-hours of electricity each year with an LED lighting retrofit;
- Fresh Press and the Sustainable Student Farm, whose Campus Circular Economy project features a Community Sourced Paper subscription service; and
- The Sustainable Agriculture Food Systems, taking tomatoes, grain, currants, and other foods grown on campus and processing them into pasta sauce, flour, juice, and more.

The other winning projects were the Student-Led Aquaponics Team, Illini Lights Out, the Allerton Park Compost Toilet, and Campus Bicycle Parking.

[A full list of winners and banquet photos can be found on SSC's Facebook page.](#)



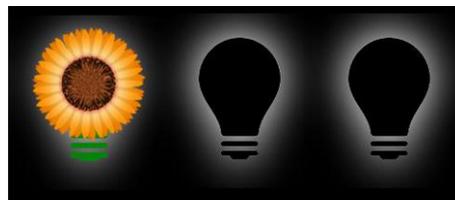
Alex Dzurick, left, receives an award for Illini Lights Out from SSC Chair Paul Couston.

What's new in campus sustainability ...

Illini Lights Out: A Success in '16-17

During seven Illini Lights Out events in the 2016-17 academic year, teams of student volunteers turned off more than 11,000 light fixtures in buildings on or near the Illinois Main Quad on Friday evenings to save campus about \$3,400 in energy costs — not to mention lengthening the lifespan of several thousand bulbs.

Over the course of the school year, this program reached more than 200 students



and covered 17 campus buildings.

Organized by iSEE's Energy Conservation and Building Standards Sustainability

Working Advisory Team (SWATeam), Illini Lights Out aims to demonstrate the immense energy-saving impact of simply turning off lights when you leave a classroom, lab, or study space.

Illini Lights Out began as a one-off event in Spring 2016, and expanded to a monthly happening this year with the support of a grant from the Student Sustainability Committee (SSC).