NECEM SEMINAR: "Using Low-Cost Renewable Energy for Waste Valorisation"

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Wednesday 22nd January 2019, 2-3pm
Newcastle University, Bedson Building, Lecture Theatre 1.75
Refreshments available after the seminar

In the past decade wastewater innovators have made significant advancements in recovering electrical energy from wastewater, yet the scalability and economic benefits of electricity production from wastewater still face challenges, partially because of the dramatic decrease in renewable electricity price. With renewable electricity costing 2 cents per kwh to even negative in some places during some periods, how to use cheap renewable energy to maximize waste valorisation can become an interesting direction. In addition, wastewater treatment can carry mutual benefits to renewable energy industry, as water is a common electrolyte and energy storage medium.

In this talk, I will discuss some recent progress in identifying the synergy between microbial electrochemistry and photoelectrochemistry that led to the development of new materials and systems for spontaneous high rate H_2 production from wastewater and sunlight. I will also report some development on functional hydrophobic gas transfer membrane electrodes that enabled specific resource recoveries from wastewater and CO_2. While we have been focusing on energy-neutral wastewater treatment, I argue maybe we can start to think broadly on carbon-negative and dollar-positive wastewater treatment beyond energy production.

Biography

Z. Jason Ren (@zjasonren) is a professor in the Department of Civil and Environmental Engineering and serves the Associate Director for Research in the Andlinger Center for Energy and the Environment at Princeton University. His research focuses on environmental bioengineering with special expertise in resource recovery from waste streams and in broad areas linked to the "water-energy nexus". His WET Lab (Water & Energy Technologies) analyzes reaction mechanisms and develop processes for energy and resource recovery during environmental processes such as wastewater treatment, environmental remediation, and water desalination (https://ren.princeton.edu). His group has published papers in *Nature Energy, Nature Sustainability, Nature Climate Change, Science Advances, Energy & Environmental Science, Environmental Science & Technology, Water Research*, and other journals. Dr. Ren completed his Ph.D. in Environmental Engineering at Penn State University. Before that he worked as an environmental engineer after graduated from Tianjin University.

Location

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