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### Using Low-Cost Renewable Energy for Waste Valorization

Zhiyong Jason Ren  
*Princeton University*

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**MONTCLAIR STATE**  
UNIVERSITY

The Doctoral Program in Environmental Science & Management  
and MSU Sustainability Seminar Series Present:

## Using Low-Cost Renewable Energy for Waste Valorization

WHEN: January 28, 4:00 pm WHERE: CELS 120 lecture hall

**Dr. Zhiyong Jason Ren**

Department of Civil and Environmental Engineering & Andlinger Center  
for Energy and the Environment, Princeton University



Z. Jason Ren (@zjasonren) directs the WET Lab (Water & Energy Technologies) at Princeton. His lab 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, Environmental Science & Technology, Water Research, and other journals. Dr. Ren completed his Ph.D. in Environmental Engineering at Penn State University.

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 valorization can become an interesting direction. 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<sub>2</sub> 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<sub>2</sub>. 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.

For more information please contact Dr. Yang Deng at [dengy@mail.montclair.edu](mailto:dengy@mail.montclair.edu)