VANDERBILT UNIVERSITY School of Engineering

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

Seminar

Friday,

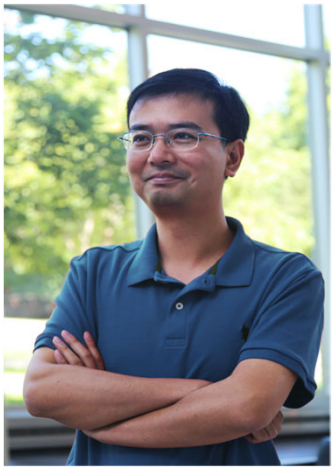
Oct. 1, 2021

12:00 pm – 1:00 pm

Via Zoom

"OPENING THE 'BLACK BOX' OF LEEFT FOR WATER DISINFECTION"

DR. XING XIE



ASSISTANT PROFESSOR
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ABSTRACT

Water is a basic human need. Nevertheless, more than 10% of the world's population lacks access to safe drinking water. An effective water disinfection method is still not readily accessible to these people. In developed urban areas, water is typically disinfected in a centralized facility through chlorine-based methods that inevitably generates harmful disinfection byproducts. In addition, current water disinfection systems are vulnerable to natural disasters. Next-generation water disinfection should minimize the use of chemicals, the consumption of energy, and the impact on the environment, while having high resilience for different application scenarios. The recently developed water disinfection approach based on locally enhanced electric field treatment (LEEFT) has a great potential to transform current water disinfection strategies and systems. The LEEFT is a physical treatment process that aims to utilize a strong electric field to disrupt cell membranes and thus inactivate pathogens. LEEFT can potentially be applicable at all scales, from portable devices to point-of-use household units and from distributed community-scale treatment clusters to centralized treatment plants. In the past years, novel LEEFT electrodes and high-performance LEEFT systems have been developed. Nevertheless, direct evidence to support the electroporation mechanism is still lacking. This talk will focus on our recent study using a lab-on-a-chip device to conduct operando characterization of LEEFT

BIOGRAPHY

Dr. Xing Xie is an assistant professor and the Carlton S. Wilder Junior Professor in the School of Civil and Environmental Engineering. Prior to joining GT, he was a postdoc at Caltech. Dr. Xie received his B.S. (2006) and M.S. (2008) degrees in Environmental Science & Engineering from Tsinghua. He received his Ph.D. degree (2014) in Civil & Environmental Engineering and his second M.S. degree (2012) in Materials Science & Engineering from Stanford. He has been applying environmental biotechnology and materials science to address challenges at the nexus of water and energy, such as developing low-cost water treatment technologies that improve global access to safe drinking water. He has published more than 60 peer-reviewed articles in leading journals, including PNAS, Nature Communications, Environmental Science & Technology, and Energy & Environmental Science. His work has been cited over 7000 times with an H-index of 28. Dr. Xie is a recipient of the NSF CAREER award in 2019.

ZOOM INFORMATION: https://vanderbilt.zoom.us/j/97882347128

Meeting ID: 978 8234 7128