



Environmental Engineering & Sciences

Department of Civil and Environmental Engineering
EES Special Seminar

Thursday, March 7, 2024 | 1:00 – 1:50 pm CST | 3310 Yeh Center

Transforming Urban Infrastructure: Innovative Methods for Drinking Water Treatment, Wastewater Resource Recovery, and Decentralized Precision Digital Agriculture to Boost Urban Sustainability and Resilience

ASCE's grading places US urban infrastructures at D+ for wastewater and D for drinking water, highlighting a pressing need for innovation in both areas. The "Minus Approach" is introduced as a transformative solution. This method, combining membrane-based separation and AI integration, enhances safety in chlorinated drinking water by minimizing the presence of regulated and unregulated disinfection byproducts (DBPs), as well as known, unknown, and emerging contaminants (KUECs) in chlorinated water without compromising quality. It holds promise enhancing future drinking water risks associated with the KUECs.

Simultaneously, traditional wastewater treatment neglects valuable resources. We advocate a paradigm shift—treating wastewater as a resource. Leveraging the Minus Approach, we recover nutrients and water for decentralized precision digital agriculture, revolutionizing wastewater management. This dual-pronged strategy not only ensures safer drinking water but also contributes significantly to urban sustainability and resilience.

Dr. Yongsheng Chen Bonnie W. and Charles W. Moorman IV Professor & Director

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Biography

Dr. Yongsheng Chen is the Bonnie W. and Charles W. Moorman IV Professor in the School of Civil and Environmental Engineering at Georgia Institute of Technology and the Director of Nutrients Energy Water Center for AgTech. Professor Chen joined Georgia Institute of Technology in 2009. Professor Chen's research interests include environmental nanotechnology, membrane technology for sustainable energy and nutrients recovery, the Food-Energy-Water Nexus, and machine learning for sustainable membrane material screening, system integration, and process optimization. He has served as PI/Co-PI on sponsored research projects totaling more than \$41M, of which, \$18.5M has been, or is being, spent in his laboratory. He has over 206 published research articles. He has received numerous accolades, including the CAPEES/Nanova Lifetime Achievement Award, the American Chemical Society Editor's Award, the Georgia Institute of Technology's Sustained Research Award and Multidisciplinary Research Award, Sigma Xi Best Ph.D. Student Dissertation Advisor Award, and AEESP Outstanding Ph.D. Student Advisor Award. His work has been recognized by more than 20 national and international media outlets including Forbes, C&EN, AEESP, The Atlanta Journal-Constitution (AJC), and Water Environment Federation.