ABSTRACT

Society is currently confronting serious threats to our sustainable development including the contamination of dwindling freshwater supplies, an impending energy crisis, and infectious disease outbreaks. Innovative materials-based strategies have emerged as a promising platform for sustainable water treatment, renewable energy production, and antimicrobial applications with performance that can far exceed traditional approaches. Work presented herein will demonstrate the promise of several novel materials-based strategies for addressing challenges at the water-energy-health nexus. For example, an emerging photocatalyst of graphitic carbon nitride was proven highly effective for degrading a broad spectrum of persistent organic micropollutants, producing a value-added chemical of hydrogen peroxide, and inactivating pathogens under (simulated) sunlight and artificial indoor light, which provides a sustainable approach for water, energy, and health applications. In addition to focusing on the fundamental science of innovative materials interacting with chemical and biological systems, this talk will also discuss the practical engineering application and commercialization potential of these materials.

Danmeng Shuai, Ph.D.,
Assistant Professor
Department of Civil & Environmental Engineering
The George Washington University

BIO: Dr. Danmeng Shuai is an Assistant Professor in the Department of Civil and Environmental Engineering at The George Washington University (GW). He graduated from Tsinghua University, P. R. China with a Bachelor of Engineering in 2005 and a Master of Engineering in 2007, and received a Ph.D. in Environmental Engineering from the University of Illinois at Urbana-Champaign in 2012. He worked as a postdoctoral research associate in the University of Iowa from 2012 to 2013. His research interests are in the development of novel materials and processes for sustainable water purification, renewable energy production, and health protection and promotion. He has published peer-review journal articles in Environ. Sci. Technol., Water Res., ACS Appl. Mater. Interfaces, ACS Sustainable Chem. Eng., ACS Catal., Appl. Catal. B, etc. His current research is supported by National Science Foundation and US Department of Agriculture. He is the recipient of 2018 GW School of Engineering and Applied Sciences Outstanding Junior Researcher Award.