



THE OHIO STATE UNIVERSITY

The William G. Lowrie Department of Chemical and Biomolecular  
Engineering Graduate Program Cordially invites you to attend a seminar on

**Innovating Hydrogels at Multiscale for  
Water and Environmental Sustainability**

**Dr. Youhong (Nancy) Guo**

*Postdoctoral Associate  
Massachusetts Institute of Technology*

**February 22, 2024, 11:30 AM**

**130 Koffolt Lab, CBEC 151 W Woodruff Ave**

**Reception at 11:00 AM - CBEC Lobby**

**Bio**

Dr. Youhong Nancy Guo is currently a Postdoctoral Associate in the Department of Chemical Engineering at Massachusetts Institute of Technology. Dr. Guo received a B.Sc. degree and a M.S. degree in Chemical Engineering from the University of California San Diego. She earned a Ph.D. in Materials Science and Engineering at The University of Texas at Austin. Her research focuses on developing polymer materials for applications in energy and environmental sustainability, especially in solar desalination, atmospheric water harvesting, and carbon capture. Her work has been recognized by many awards and honors, such as ACS PMSE Future Faculty Scholar, Forbes 30 under 30 in Science, MIT Rising Stars in Chemical Engineering, and Materials Research Society Graduate Student Award.

**Abstract**

Advanced technologies on clean energy utilization and water resource management with low carbon emissions are crucial for the realization of a sustainable future. In this talk, I will present how to design hydrogel materials, from molecular-level building blocks to microscopic structures and surface properties, for efficient water purification and carbon capture that are powered by sunlight or electricity. First, the hydrophilic polymeric mesh of hydrogels interacts with water molecules in a unique way that energy consumption of targeted separation processes can be lowered. Next, through materials selection, molecular engineering, and structural design, many desired features including but not limited to pollutant sorption, anti-biofouling, moisture resistance, and mechanical robustness can be endowed. Along the way, I will discuss the potential of polymeric gels to bring deployable solutions to water scarcity and greenhouse gas emissions regardless of geographical or hydrologic conditions, or even for economically stressed and off-grid communities.