



Seminar: Energy-Water-Environment Sustainability (EWES)

Accelerating Scalable Decarbonization Efforts By Advancing Insights into Fluid-Particle Interactions and Novel Carbon Transformations In Subsurface and Engineered Processes

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Abstract:

Meeting our energy and resource needs while removing greenhouse gas emissions from our emissions, air and ocean is one of our grand societal challenges. Novel materials and processes are needed to capture, use, store, and remove greenhouse gases to foster a sustainable future. Towards this end, advancing the science of fluid-solid interactions in complex environments and harnessing this understanding to develop novel and scalable pathways to transform matter involving CO₂ interactions is essential. In this context, we will discuss the role of emerging understanding of the organization and transport behavior of nanoconfined fluids as it relates to the capture, storage, and utilization of CO₂ in natural and engineered environments. Novel multi-phase chemical pathways for producing hydrogen with inherent carbon removal and hybrid absorption-crystallization pathways for CO₂ capture and removal, with the potential for utilization will be discussed in this context. The role of naturally occurring minerals, distributed biomass resources, low value residues including alkaline residues in enabling our transition to a low carbon future are evaluated.

Bio: Dr. Greeshma Gadikota is an Assistant Professor and Croll Sesquicentennial Fellow in the School of Civil and Environmental Engineering at Cornell University. Dr. Gadikota directs the Sustainable Energy and Resource Recovery Group. Prior to Cornell, she served on the faculty at the University of Wisconsin – Madison, held postdoctoral research associate appointments at Princeton University and Columbia University, and a research associate appointment at the National Institute of Standards and Technology (NIST). Her PhD in Chemical Engineering and MS degrees in Chemical Engineering and Operations Research are from Columbia University. Her BS in Chemical Engineering is from Michigan State University. She is a recipient of the DOE and ARO CAREER Awards, AIChE Sabic Award for Young Professionals from the Particle Technology Forum, an invited participant in the NAE Frontiers of Engineering, invited speaker at the NAE German-American Frontiers of Engineering Symposium, was recognized as a Scialog Fellow in Negative Emissions Science, and received the 2020 *Minerals* Young Investigator Award.

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<https://illinois.zoom.us/j/83198267610>

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12:00 – 12:50 p.m. CST