



**Chemical Engineering  
Spring 2023 Seminar Series**

# **Engineering the Electrical Response of Suspensions of Conducting Particles**



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66-110  
3:00-4:00pm  
2:45pm Reception

Complex fluids that incorporate electrically active components into their microscopic building blocks are an emerging class of soft matter with the potential to exhibit new behaviors. Their properties can be engineered by controlling the nanoscale forces that determine the structure and dynamics of those building blocks and how electrons move within and among those structures. In this talk, I will discuss how this research theme promises to accelerate the development of flow-assisted electrochemical systems (FAES), which rely on suspension electrodes for their function. Suspension electrodes are fluid suspensions of metallic or semiconducting nanoparticles that maintain an electrically percolated state under flow. Our recent work has sought to reveal how the particles in such suspensions exchange electrons and facilitate bulk transport. To do this, we combine new synthesis techniques with advanced electrical characterization tools to probe the underappreciated role of particle dynamics in the transport process. These new insights allow us to propose design rules that can be used to engineer the electrical response of such suspensions for improved performance and new functionality.

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