

THE MATERIALS SCIENCE AND ENGINEERING DEPARTMENT
SPRING 2026 COLLOQUIUM SERIES PRESENTS:

Professor David Ginger

Chair of Chemistry, Chief Scientist of UW Clean Energy Institute
University of Washington



Electrochemistry, Ions, and Interfaces in Emerging Semiconductors: From Organic Electronics to Halide Perovskites

New semiconductors offer new opportunities for optoelectronic device integration and applications, from additive manufacturing of organic semiconductor-based bioelectronics and neuromorphic devices to halide perovskite solar cells, light-emitting diodes, and quantum light sources. In some applications (organic bioelectronics) electrochemistry and ion transport across interfaces can enable new functionality, allowing transduction of signals across the biological/digital divide. In other applications (solar cells under reverse bias) electrochemistry at interfaces can lead to premature device failure. In this talk, I will discuss our work probing kinetics of electrochemical processes and ion transport in both organic mixed ionic/electronic conductors (OMIECs), and in halide perovskite semiconductors. I will highlight multimodal imaging approaches, first focusing on OMIECs, and how electrochemistry can be used to understand the factors that limit doping, mobility, and switching speeds in organic semiconductors. In the second half of the talk, I will discuss electrochemistry and interfaces in halide perovskite devices, including high-brightness LEDs and solar cells, focusing on performance optimization, failure mechanisms, and improving reverse-bias stability.

David S. Ginger is the B. Seymour Rabinovitch Endowed Chair in Chemistry at the University of Washington, where he also serves as Chief Scientist of the UW Clean Energy Institute and Founding Director of the NSF Center for Integration of Modern Optoelectronic Materials on Demand (IMOD). He is also a Lab Fellow at Pacific Northwest National Laboratory (dual appointee). Ginger's research uses advanced microscopy and spectroscopy to understand emerging semiconductor materials, with applications in solar energy, optoelectronics, quantum technologies, and neuromorphic computing. He is a Fellow of the AAAS and the Materials Research Society, a member of the Washington State Academy of Sciences, and has received major honors including the Presidential Early Career Award for Scientists and Engineers and the ACS Unilever Award.

Tuesday, April 7th • 4 pm CT • Tech L211

In person only; no Zoom

Questions? Contact allison.macknick@northwestern.edu