Professor David Limmer

University of California, Berkeley

***Charge separation in systems far-from-equilibrium.***Charge separation is a fundamental process occurring throughout natural and synthetic systems. It is the origin of current in photovoltaics and provides a means of storing energy in capacitors. In this talk, I will discuss some of our recent efforts to understand how charges separate and recombine in nanoscale, heterogeneous systems. In the first part, I will show how photo-generated electrons and holes in the lead halide perovskites are slow to radiatively recombine due to polaronic effects that result from characteristically soft, polar lattices. In the second part, I show how ionic solutions confined to nanofluidic devices can respond nonlinearly to applied electric fields, generating higher currents than anticipated from their bulk counterparts.  In both cases, our progress is enabled and enriched by novel simulation tools and fundamental theoretical developments.

**Bio:** David Limmer is an Assistant Professor in the Department of Chemistry at University of California Berkeley, a Research Scientist in the Materials and Chemical Sciences Divisions of Lawrence Berkeley National Laboratory, and a Fellow of the Kavli Energy NanoSciences Institute. He received his  BS in chemical engineering at the New Mexico Institute of Mining and Technology and his Ph.D. in chemistry from the University of California, Berkeley under the supervision of David Chandler. From 2013-2016, David was an independent fellow of the Princeton Center for Theoretical Science. Throughout his independent career, David has been recognized as a Heising-Simons Fellow of the Kavli Foundation, a Scialog Fellow of the Research Corporation for Science and Gordon and Betty Moore Foundation, and a Hellman Fellow. In 2019, he was the recipient of the Department of Energy Early Career Award.