

# Physical Chemistry Seminar

Wednesday, January 31, 2018

12:30 pm, BRWN 4102



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## **Optical Electrophysiology: From Microbes to Mice**

**Abstract:** Every lipid bilayer is an electrical insulator, and charge imbalances between its faces can lead to a membrane voltage. Voltage modulates many transmembrane transport processes, and membrane voltage is dynamically regulated in most cell types--most famously in neurons and cardiac cells, but also in bacteria, plants, and intracellular organelles. Membrane voltage is very hard to measure because it is not directly visible. We have developed fluorescent protein reporters of membrane potential, and associated instrumentation for high-speed voltage imaging. I will describe some new tools for all-optical electrophysiology, and illustrate with examples of measurements in bacteria, fish, and in the brains of behaving mice.