SACRAMENTO STATE

Department of Physics and Astronomy

SPRING 2023 Colloquium Series

"Imaging the Brain at High Spatiotemporal Resolution"

Dr. Na Ji

University of California, Berkeley

Physics aims to understand the universe. Neuroscience aims to understand the brain, an organ that distinguishes humans as a species, defines us as individuals, and provides the intellectual power with which we explore the universe. Composed of electrically excitable cells called neurons, the brain continuously receives and analyzes information, makes decisions and controls actions. Similar to systems studied in physics, where many properties emerge from the interactions of their components, the functions of the brain arise from the interactions of neurons. The fundamental computational units of the brain, neurons communicate with one another electrochemically via submicron structures called synapses. Synapsing onto one another, neurons form circuits and networks, sometimes spanning centimeters in dimension and specializing in different mental functions.

To understand the brain mechanistically, we need methods that can monitor the physiological processes of single synapses as well as the activities of a large number of networked neurons. Using concepts developed in astronomy and optics, my laboratory develops next-generation optical microscopy methods for understanding the brain at higher resolution, greater depth, and faster time scales. In this talk, I will outline the past and ongoing research efforts in my lab.

Thursday, March 30, 2023

4:00 – 5:20PM

MND1015

Open & Free to all students, faculty and public