

**Title:** Functional synaptic architecture of visual cortex

**Abstract:**

The pioneering work of Hubel and Wiesel defined the fundamental challenge in understanding the functional organization of visual cortex: How do cortical circuits transform the information supplied by different populations of retinal ganglion cells into coherent representations of the visual world? Their demonstration of emergent properties of cortical circuits such as selectivity for the orientation of edges, and an orderly columnar architecture for orientation preference set the stage for a host of studies that have addressed the circuit mechanisms responsible for this transform. While progress has been substantial, the fine scale functional synaptic architecture that allows individual neurons to integrate inputs from diverse sources to produce coherent sensory representations remains largely unknown. This presentation will focus on recent studies employing a combination of *in vivo* imaging and stimulation techniques with cellular and synaptic resolution that provide new insights into the role that functional specificity in synaptic connections and dendritic topology play in shaping the cortical transform.