The beginning of the 21st century has seen a great renaissance in light microscopy in neuroscience, with new instruments and brain clearing and staining methods capable of generating complete datasets for the mouse brain at up to a submicron brainwide resolution. Here I will review the main pros and cons of the different types of the microscopy instrumentation and methods, and I will also describe our computational pipeline and toolchain software called Headlight for reconstruction, anatomical registration and computational analyses of the whole brain datasets. Finally, I will give examples of scientific applications from my lab at CSHL in systematic atlasing of cell-type distribution and morphology as well as from a biotech start-up Certerra focused on commercializing these methods for CNS drug screening.

Host: Sebastian Seung