

David Kleinfeld, PhD

Distinguished Professor of Physics and Biology at the University of California at San Diego (UCSD), Fellow of American Academy of Arts and Sciences.

Prof. Kleinfeld has broad interests in systems neuroscience. His research spans sensorimotor control through brain vasodynamics and further involves the development of neurotechnology, particularly related to optical imaging. Prof. Kleinfeld determined the angioarchitecture of an entire region of cortex, mapped flow throughout this region, and derived a self-consistent model of how flow depends on the topology of the vasculature. Ongoing work is extending this analysis to the entire mouse brain. In work motivated by clinical issues of microstroke and dementia, Prof. Kleinfeld identified how an occlusion to a single penetrating arteriole will induce a microstroke and cognitive deficit. Ongoing work is extending this analysis to vascular dysfunction secondary to hyperglycemia. A third direction of Prof. Kleinfeld's work concerns the entrainment of ultraslow vasomotor oscillations by ongoing electrical activity; these studies provide a biophysical basis for resting-state fMRI. Beyond research, Prof. Kleinfeld leads the Specialization on Computational Neuroscience through the Neurosciences Graduate Program at UCSD, has co-directed and/or lectured in international postgraduate schools in Computational Neuroscience, Neuroinformatics, and Optical Imaging, and serves on a number of Scientific Advisory Boards.

Dr. Kleinfeld will give a talk on “**Brain angioarchitecture and the dynamics and control of cortical blood flow**”.