

Title: In Vivo Fluorescence Brain Imaging in Freely Moving Animals

Speaker:

Professor Mark Schnitzer
Biology and Applied Physics
Stanford University

Date: Friday, 13 May 2011

Time: 11:00 am – 12:00 noon

Venue: Room 603, Chow Yei Ching Building

Abstract:

Recent advances permit fluorescence calcium-imaging studies of neuronal and astrocytic dynamics during active animal behavior.

The two main approaches involve either head-fixation of an animal under a conventional, upright two-photon microscope, or use of miniaturized fluorescence microscopes that are based on micro-optical probes and permit high-speed brain imaging in a freely behaving animal. I will compare the two methodologies with regard to optical properties and behavioral flexibility for the animal, drawing from our group's data of both types to provide illustrative examples. Overall, the capability to record optically from hundreds of cells concurrently while monitoring an animal's cognitive or behavioral performance should provide new insights regarding the cellular basis for behavior.

Biography of the speaker:

Prof. Mark Schnitzer is Associate Professor of Biology and Applied Physics at Stanford University and is an Investigator of the Howard Hughes Medical Institute. His research concerns the innovation of novel optical imaging technologies and their use in the pursuit of understanding neural circuits. The Schnitzer lab has invented two forms of fiber-optic imaging, one- and two-photon fluorescence microendoscopy, which enable minimally invasive imaging of cells in deep brain tissues. The lab is further developing microendoscopy technology, studying how experience or

environment alters neuronal properties, and exploring two different clinical applications. The group has also developed two complementary approaches to imaging neuronal and astrocytic dynamics in awake behaving animals. He has been granted or submitted over 14 USPTO patents in optics and imaging. He has also received a number of awards including Michael & Kate Bárány Young Investigator Award, Biophysical Society, 2010; NIH Director's Pioneer Award, 2007; Member of The Brilliant 10, Top ten brilliant scientists under age 40, 2007 Popular Science ; World's Top 100 Innovators under age 35, Technology Review Magazine, 2003.

Organizer: Dr. K.K.M. Tsia