PHOTONICS CENTER DISTINGUISHED SEMINAR SERIES

Professor Peter T. C. So, MIT

High-Resolution Shaping and Sensing Light: From Neurobiology to Sickle Cell Disease

April 27, 2017

2-3 p.m.

Room 901

Photonics Center

8 Saint Mary's Street

Refreshments will be served!

Recent advances in our ability to shape light with high fidelity and to sense optical fields with exquisite sensitivity, have enabled many exciting applications in biology and medicine. First, Professor So will focus on the problem of understanding how a single neuron integrates its input signals from its 104 synapses in a living mouse brain. He will tackle this challenge by holographically shaping femtosecond light to monitor genetically expressible calcium sensors from over hundreds of synapses simultaneously using multiphoton excitation. Second, he will describe the identification of biophysical markers of red blood cells from sickle cell disease patients that may aid in the identification of new drug targets. He will accomplish this task by developing interferometric phase microscopes that are capable of sensing membrane fluctuations on the sub-nanometer scale at video rate while quantifying the hemoglobin content in individual red blood cells.

Peter So is a Professor in the Department of Mechanical and Biological Engineering at the Massachusetts Institute of Technology (MIT). Prior to joining MIT, Peter So obtained his Ph.D. from Princeton University in 1992, and subsequently worked as a postdoctoral associate in the Laboratory for Fluorescence Dynamics at the University of Illinois at Urbana-Champaign. His research focuses on developing high resolution and high information content microscopic imaging instruments. These instruments are applied in biomedical studies such as the non-invasive optical biopsy of cancer, the mechanotransduction processes in cardiovascular diseases, and the effects of neuronal remodeling on memory plasticity. Peter So is currently the Director of the MIT Laser Biomedical Research Center, a NIH NIBIB P41 research resource.

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