香港浸會大學
HONG KONG BAPTIST UNIVERSITY

香港浸會大學理學院
HKBU Faculty of Science

ICTS Institute of Computational and Theoretical Studies 計算及理論研究所

Department of Physics 物理系

Distinguished Lecture Series

Visualizing the Multi-scale Complexity of the Brain

15 June 2021 (Tuesday)
10:00-11:30 a.m. GMT+8 (Hong Kong Time)

Online via Zoom
(Meeting ID: 981 8581 9842)

ABSTRACT

The brain is complex over multiple length-scales, from many protein molecules forming intricate nano-machines in a synapse to many neurons forming interconnected networks across the brain. Unraveling this multi-scale complexity is fundamental to our understanding of brain function and disease. In this lecture, I will introduce advances in visualizing the complex, multi-scale structures in the brain. Emphasis will be on new imaging techniques, including cryo electron tomography and correlative light-electron microscopy that enabled revealing in situ organization of synaptic molecules, and ultra-high speed volumetric imaging method VISoR developed to map brain-wide circuits at subcellular resolution. I will also discuss challenges and opportunities for interdisciplinary research collaboration to analyze and understand the enormous data generated by these cutting-edge technologies.

Professor Guo-Qiang Bi

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Professor Guo-Qiang Bi received his B.S. in physics from Peking University and Ph.D. in biophysics from UC Berkeley. After postdoctoral research at UCSD, he joined the Department of Neurobiology of the University of Pittsburgh as an Assistant Professor and promoted to Associate Professor with tenure. In 2007, He established the Laboratory of Neurophysics at USTC, where he has been Xinchuang Professor and Changjiang Scholar, and chair of the Department of Neurobiology and Biophysics. Since 2020, he has been co-appointed as professor and funding director of the Interdisciplinary Center for Brain Information, Shenzhen Institute of Advanced Technology. His main research interest is mechanisms and principle of synaptic plasticity and of learning. In recent years, he and colleagues have been developing and applying new tools of optical imaging and electron microscopy to dissect the multi-scale structure of neuronal synapses and brain circuits.

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